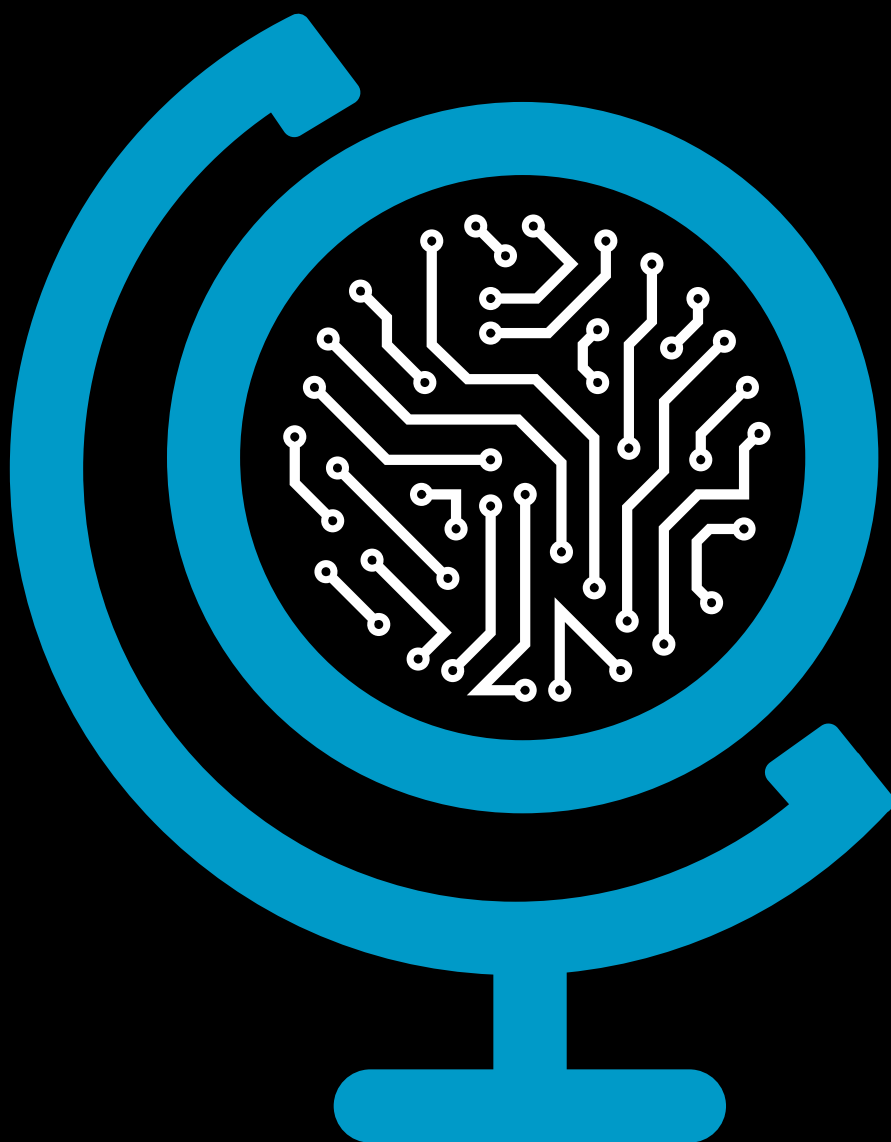




INESCTEC
TECNOLOGIA E CIÊNCIA



RELATÓRIO
DE ATIVIDADES
2015

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1 Introdução

O presente relatório tem por objetivo apresentar as realizações mais marcantes do INESC TEC durante o exercício de 2015, no quadro do contexto e da trajetória evolutiva da instituição. São apresentados indicadores de atividade, resultados tangíveis alcançados e é dado destaque às realizações mais importantes da instituição.

A vertente económico-financeira das atividades desenvolvidas pelo INESC TEC durante o ano de 2015 encontra-se refletida no Relatório e Contas do exercício.

O presente documento encontra-se organizado num corpo principal e anexos diversos.

O corpo principal (Parte A) descreve aspetos gerais e de síntese da atividade do INESC TEC em 2015, sublinhando e detalhando os mais pertinentes para uma apreciação global. Nesta secção são ainda incluídos os principais indicadores de atividade da instituição.

A Parte B apresenta a estrutura organizacional do INESC TEC, identificando as estruturas de apoio e descrevendo sucintamente os Centros de Investigação (o detalhe de cada centro é remetido para as respetivas páginas web).

Na Parte C autonomiza-se a atividade de cada Centro, através de diversos indicadores referentes a projetos, publicações e orientação de dissertações e teses.

Em complemento aos dados globais e indicadores fornecidos nas secções anteriormente referidas, na Parte D destaca-se a atividade mais importante desenvolvida pelo INESC TEC no ano de 2015, relevando a sua capacidade de investigação multidisciplinar de excelência internacional socialmente relevante e com impacto económico, muito em particular nas empresas de setores exportadores que competem nos mercados globais. Em evidência está também o papel do INESC TEC enquanto mediador no estreitamento de relações da universidade e do politécnico com o tecido empresarial, a administração pública e a sociedade. Esta compilação, que não pretende ser exaustiva, baseia-se em notícias e destaques extraídos do Boletim do INESC TEC (BIP), bem como em notas de imprensa divulgadas durante 2015.

2 Objetivos do Plano de Atividades para 2015

No início de 2015 a atividade do INESC TEC estava condicionada por um conjunto marcante de elementos de contexto, a saber:

- a reposição dos níveis de financiamento ao Laboratório Associado, na sequência da atribuição da classificação de Excelente na avaliação internacional levada a cabo pela FCT;
- o arranque do Programa H2020, após um forte investimento na elaboração de candidaturas;
- o arranque do novo Quadro Comunitário de Apoio (Programas Portugal 2020 e, em particular, Norte 2020), perspetivando oportunidades de projetos com empresas;
- a potencial instabilidade nas políticas de apoio à ciência (projetos FCT, bolsas de doutoramento, contratos pós-doc) decorrente de possíveis alterações governamentais.

Com esse cenário como pano de fundo, foram apresentadas e aprovadas na reunião de Conselho Geral (janeiro de 2015) as seguintes Linhas Mestras para o ano de 2015:

- consolidação do processo de integração dos novos Centros de I&D e de um modelo de partilha de custos indiretos;
- exploração do papel dos clusters no modelo organizacional e de governação;
- desenho de apostas estratégicas (TEC4X) caucionadas pela avaliação FCT, em áreas como mar, saúde, energia, etc.;
- aposta em novos projetos europeus (H2020) com início em janeiro de 2015;
- relançamento de candidaturas a projetos em co-promoção com empresas no âmbito do Portugal 2020 e Norte 2020;
- implementação de um novo modelo de parceria estratégica com empresas através de contratos-programa plurianuais (EDP, Kyaia, Biodevices);
- iniciativas orientadas para a implementação das estratégias regionais de especialização inteligente em parceria com a CCDR-N (alavancar nos Polos e Clusters e na P. NW Global);
- celebração dos 30 anos do INESC no Porto, com os associados e parceiros estratégicos, divulgando a relevância e o impacto da ciência nas empresas e na sociedade;
- implementação de alterações estatutárias, com o objetivo de flexibilizar o modelo de governação e facilitar a transição geracional dos quadros dirigentes.

3 Destaques dos resultados alcançados em 2015

Pode afirmar-se que os objetivos estabelecidos foram não só atingidos como claramente ultrapassados. De forma muito sucinta, podem relevar-se alguns factos marcantes do ano de 2015:

- um crescimento significativo (26%) do volume global de atividade, destacando-se os aumentos dos contratos de I&D com empresas e, muito em especial, dos projetos europeus;
- o habitual equilíbrio das fontes de financiamento, com 40% dos rendimentos provenientes de Programas Nacionais, 31% de Programa Europeus e 27% de Contratos de I&D com empresas, que permitiu a apresentação de contas equilibradas;
- a melhoria dos índices de produção científica globais, com um aumento da publicação em revistas e das publicações em conferências;
- um aumento significativo das atividades de transferência de tecnologia para o tecido empresarial e institucional, expresso no aumento dos projetos em consórcio, da atividade de I&D contratual, do licenciamento de tecnologia e do lançamento de empresas spin-off;
- um aumento de dimensão em recursos humanos (mais 66 colaboradores), totalizando 715 integrados, aos quais se juntam 215 com ligações mais ténues (investigadores colaboradores e alunos);
- investimentos de carácter estratégico em equipamento científico e laboratorial num valor próximo de 1 milhão de euros, aproveitando as oportunidades de financiamento disponíveis e suportando a parte não financiada com receitas próprias;
- consolidação de um modelo sustentável de financiamento baseado na diversidade e equilíbrio das fontes, o que permitiu diminuir em 25% as necessidades de financiamento à tesouraria, aumentar os meios libertos e diminuir os custos bancários;
- manutenção da diversidade na internacionalização dos recursos humanos, contando-se no final do ano 101 colaboradores, dos quais 7 pós-doc, sendo ainda estrangeiros cerca de 25% dos estudantes de doutoramento acolhidos no INESC TEC;
- alterações estatutárias e do modelo de governação da instituição, preparando-a para uma transição geracional que foi iniciada no final do primeiro semestre de 2015, com a eleição do novo Conselho de Administração em 8 junho.

4 Evolução do modelo de governação e gestão

Uma das mais importantes alterações estatutárias aprovadas pelo Conselho Geral foi a revisão do modelo de governo da instituição, que entretanto teve o nome alterado para INESC TEC, designação anteriormente adotada para o Laboratório Associado. A Direção de até cinco membros foi substituída por um Conselho de Administração de até nove membros, no âmbito do qual foi criada uma Comissão Executiva de três membros.

Este novo modelo permitiu a constituição de uma equipa alargada de gestão, juntando cinco novos administradores a quatro membros da anterior Direção. Estes cinco elementos, até à altura Responsáveis de Centro de Investigação, trouxeram todo o seu conhecimento da instituição, bem como novas visões e modos de fazer que se têm revelado de enorme utilidade na evolução do INESC TEC. Foi também alterada estatutariamente a duração do mandato dos órgãos sociais, de dois para três anos, tendo o Conselho Geral acordado entretanto recomendações com vista a orientar a futura renovação dos quadros dirigentes da instituição. Prosseguiu-se também com a renovação das lideranças dos Centros de Investigação, com a substituição progressiva dos responsáveis de Centro que passaram para o Conselho de Administração.

Foi de grande importância o trabalho de estabilização levado a cabo ao nível dos Serviços de Apoio, peças críticas de apoio à operação do INESC TEC e cuja eficiência e eficácia têm vindo a ser continuamente postas à prova pelo aumento de dimensão e de complexidade da instituição. A completa e suave integração das várias Unidades de I&D externas, trabalho meticuloso que demorou vários anos, muito se deveu à qualidade destes Serviços.

O aumento de dimensão do INESC TEC significou o aumento da massa crítica em quase todos os Centros de I&D, o que exigiu autonomia de decisão e ferramentas de gestão adequadas a esse nível, naturalmente acompanhadas por uma delegação de competências cuidadosamente desenhada, que foi também operacionalizada em 2015.

Foi ainda possível levar a bom termo dois dossiês delicados da vertente da gestão económica e financeira: a distribuição, pelos diferentes Centros, dos custos indiretos e também do financiamento plurianual atribuído pela FCT ao Laboratório Associado. O racional foi, em ambos os casos, construído através de um esforço de concertação e de diálogo com todos os Centros, resultando num modelo claro e transparente, flexível e de fácil operacionalização.

Finalmente, foram constituídos diversos grupos de trabalho envolvendo membros da administração e, sempre que necessário, consultores da administração e quadros que tomaram em mãos, ainda em 2015, dossiês de maior relevo no edifício organizacional do INESC TEC, designadamente:

- o modelo integrado de indicadores de desempenho;
- a criação dos Clusters;
- a política de gestão de conflitos de interesse;
- a política e regulamento da propriedade intelectual.

O desenvolvimento e a operacionalização destes instrumentos estenderam-se para 2016, havendo intenção de, em tempo oportuno, serem apresentados ao Conselho Geral.

5 Diversificação e equilíbrio de financiamentos

Como se pode constatar pela Tabela 1, o número de projetos em consórcio com empresas nacionais sofreu uma forte redução, em razão do fecho do QREN, tendo-se observado também, uma diminuição do número de projetos FCT.

Em compensação, em 2015, a Tabela 2 mostra que os projetos europeus atingiram um número recorde: 46 projetos em execução em simultâneo.

Programa	Ano					
	2010	2011	2012	2013	2014	2015
Nº projetos FCT	50	60	61	65	44	29
Nº projetos QREN	33	46	34	20	14	7
Nº projetos P2020						3
Nº projetos integrados				7	7	14

Tabela 1 – Número de projetos financiados pela FCT, pelo QREN e pelo P2020, desde 2010

Programa	Ano					
	2010	2011	2012	2013	2014	2015
FP6	2	1				
TEMPUS	1					
FP7	11	18	22	30	26	23
AAL	1	1	1			
CIP	2	3	2	1		
COST	2	3	1	2	3	1
INTER-REG	6	8	3	2	1	2
EEA Grants						5
H2020						12
Outros	1	2	1	1	1	3
Total	26	36	30	36	31	46

Tabela 2 – Número de projetos europeus em execução simultânea em cada ano, desde 2010

Em termos de financiamento de carácter estrutural, para além do financiamento plurianual da FCT ao Laboratório Associado, já garantido, surgiu a oportunidade de um financiamento adicional, no âmbito do Programa Regional Norte 2020, através de um concurso para Projetos Integrados de Investigação enquadrando atividades mais a montante da cadeia de valor (TRL 1 a 4). A mobilização generalizada dos investigadores do INESC TEC permitiu elaborar uma candidatura individual do INESC TEC (com três linhas nas áreas do Manufacturing, Media e Internet of Things) e duas candidaturas em consórcio (nas áreas da Saúde e do Mar). Estas candidaturas foram todas aprovadas, aumentando de forma significativa o financiamento das atividades de investigação, sobretudo a partir do primeiro semestre de 2016.

Apesar do aumento de financiamento da atividade através de programas nacionais (21%), um desempenho recorde, tanto nos serviços de I&D para empresas (aumento de 17%), como nos projetos europeus (aumento de 44%), permitiu assegurar o habitual modelo de financiamento diversificado e equilibrado. A contenção nos custos e o aumento de eficiência dos serviços e dos mecanismos de gestão interna permitiram ainda manter os custos indiretos em valores razoáveis, mesmo numa fase de transição e crescimento.

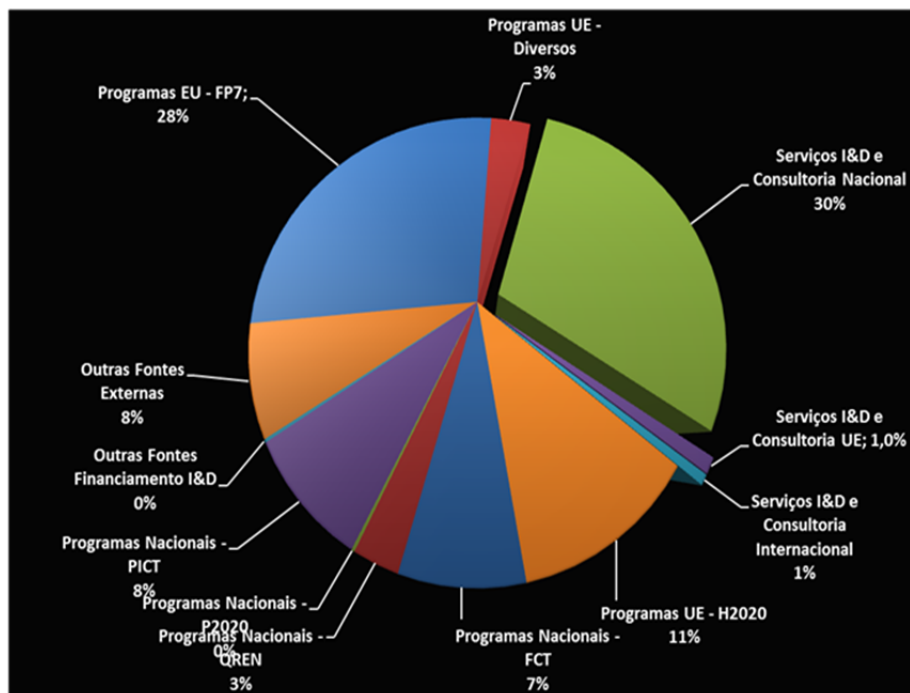


Figura 1 – Repartição de proveitos de projetos por origem de atividade

6 Resultados científicos

Na análise da produção científica, deve destacar-se o facto de se ter iniciado em 2015 uma contabilização de publicações com critérios mais exigentes do que os anteriormente adotados pela FCT, sendo agora excluídas publicações não indexadas por sistemas reconhecidos pela comunidade científica (ISI, Scopus, DBLP e outros).

Deste modo, e para permitir uma melhor comparação, apresentam-se nas Tabelas 3 e 4 os dados de 2010 a 2014 (assinalados com um asterisco), de acordo com os critérios anteriores, bem como os de 2015, conforme os novos critérios, acrescentando-se ainda os valores de 2014 que seriam contabilizados de acordo com a nova metodologia.

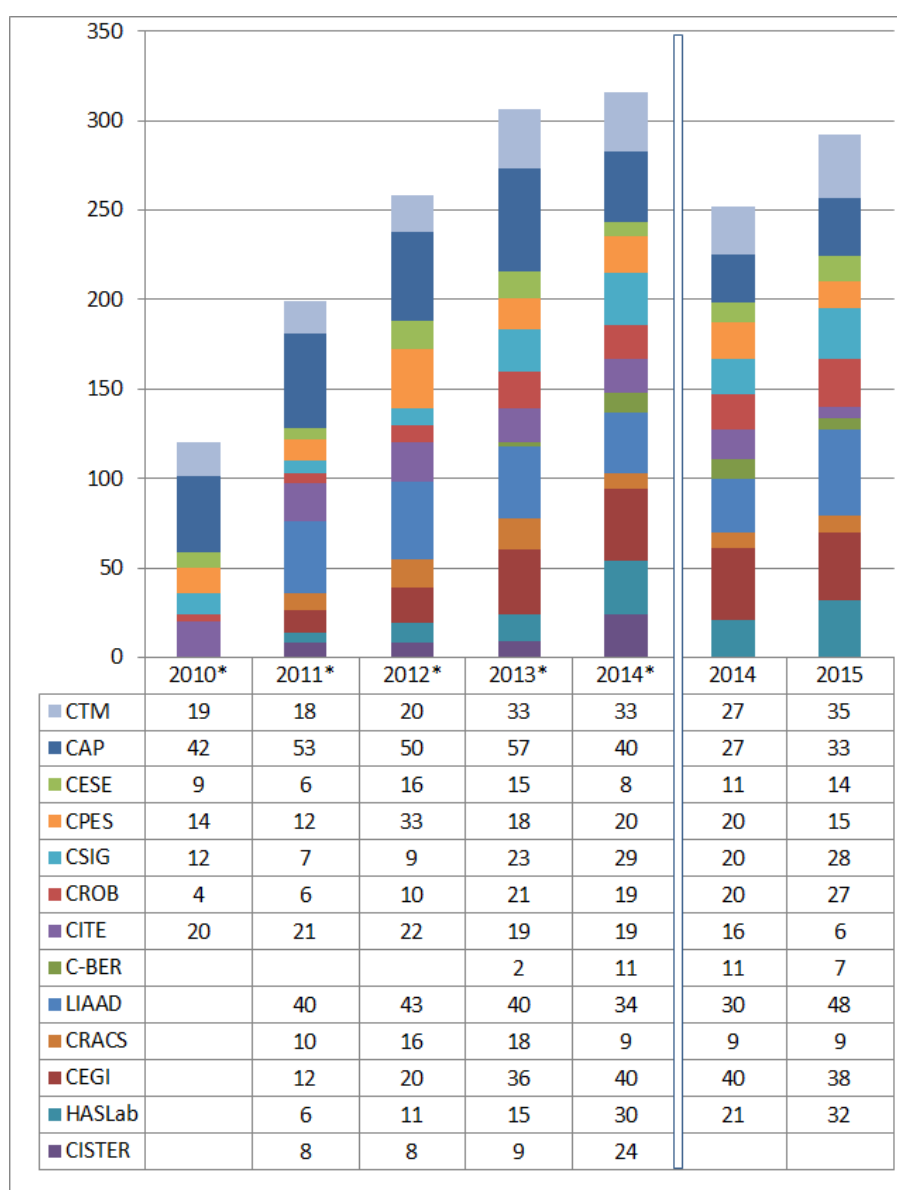


Tabela 3 – Evolução do volume de publicações em revistas internacionais desde 2010 (anos com asterisco de acordo com metodologia anterior)

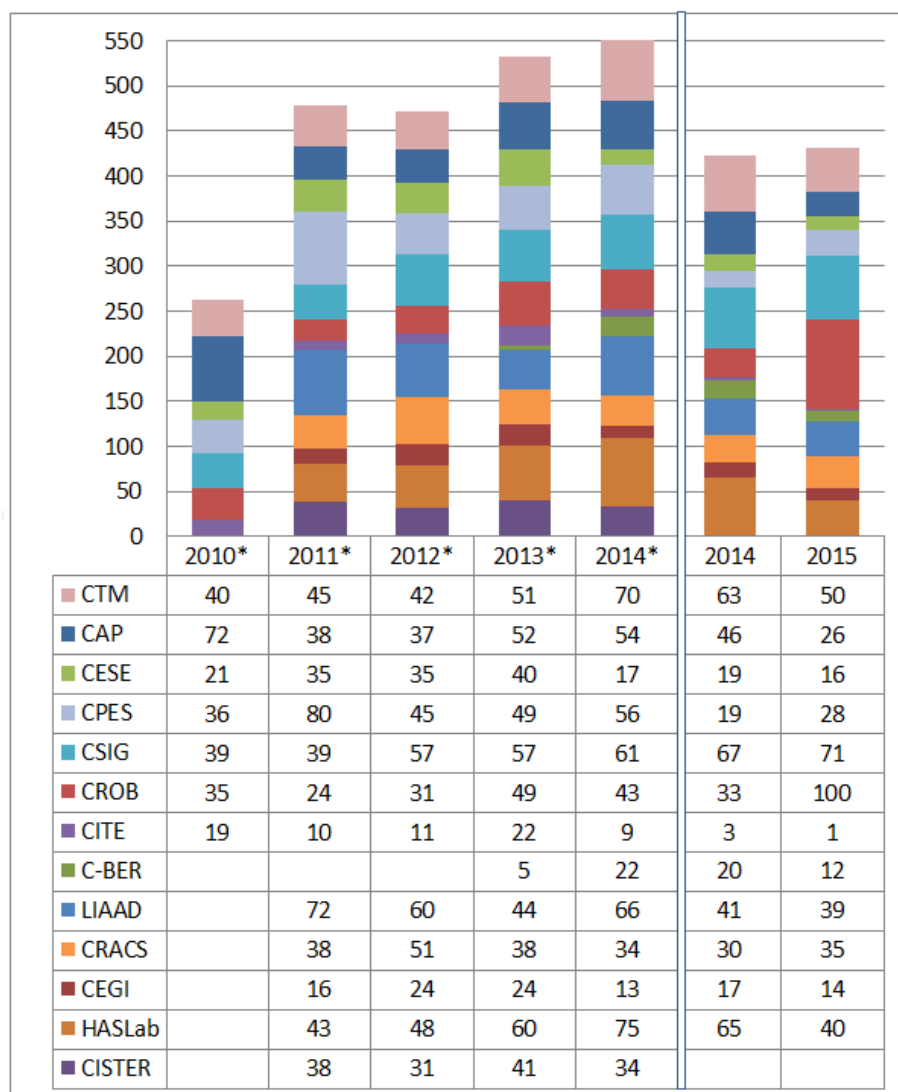


Tabela 4 – Evolução do volume de publicações em conferências internacionais desde 2010
(anos com asterisco de acordo com metodologia anterior)

Considerando os Centros que em 2015 constituem a Unidade de I&D INESC TEC, excluindo o CISTER que se tornou independente, a produção científica de publicações em revista internacional aumentou de 16% (de 252 para 292), enquanto que o número de publicações em conferência internacional aumentou apenas ligeiramente (de 423 para 432). Pode observar-se uma variabilidade da produção científica dos diversos Centros, atribuível à especificidade das áreas científicas, ao ciclo normal de publicação e ao posicionamento das atividades na cadeia de valor.

As evidências do reconhecimento externo no plano científico são diversas, sendo de relevar a nível internacional:

- a atribuição ao pós-doc Sérgio Costa da Heizer Best Dissertation Award da Academy of Management- prémio reconhecido para a melhor tese de doutoramento em empreendedorismo do mundo;
- a atribuição a João Abel Peças Lopes do título de IEEE Fellow, distinção muito restrita da sociedade científica;
- o 1.º lugar no Eurathlon Grand Challenge (Itália).

A nível nacional, destaca-se a atribuição dos seguintes prémios:

- Prémio REN (1.º e 2.º lugares);
- Prémio APREN a investigadores do INESC TEC;
- Prémio atribuído pela AIP no evento da “Green Business Week” como instituição de referência na área das Energias Renováveis e a nomeação de João Abel Peças Lopes, como personalidade do ano na área das Energias Renováveis.

A estes reconhecimentos acresce um grande número de *best-paper awards* atribuídos a investigadores do INESC TEC em conferências internacionais e muitas outras distinções.

7 Valorização e transferência de conhecimento

A área de valorização e transferência de conhecimento teve uma atividade muito intensa em 2015, pelo facto de terem entrado em velocidade de cruzeiro diversos serviços de apoio à operação do INESC TEC nesta vertente, em particular o Serviço de Apoio ao Licenciamento (SAL). O SAL oferece os seus serviços na área da proteção e valorização da Propriedade Intelectual (PI) em diferentes fases da execução dos projetos de investigação, nomeadamente: negociação de acordos de consórcio e contratos de I&D, identificação de PI com potencial para proteção e licenciamento, submissão de pedidos de patente, internacionalização de patentes e negociação de contratos de licença. Os números, refletindo as dinâmicas de mercado nas áreas científicas e tecnológicas do INESC TEC, têm vindo a crescer, sendo que no ano de 2015, foram efetuados três pedidos provisórios de patente, dois processos de internacionalização (designadamente, recorrendo ao mecanismo previsto no Patent Cooperation Treaty - PCT) e cinco comunicações de invenção. Foram ainda fechadas sete licenças, uma das quais recorrendo a um esquema de licenciamento dual em software livre, estando outras oito em negociação através de contratos com opção de licenciamento.

O Serviço de Apoio às Parcerias Empresariais (SAPE) teve em 2015 um papel fundamental, com contributos determinantes no aumento da atividade em projetos, em particular na vertente de serviços de I&D mas também em projetos europeus. A intervenção do SAPE, muito forte na construção de parcerias empresariais a jusante no âmbito das Plataformas TEC4, também se fez sentir mais a montante no desenho de parcerias com instituições de I&D para a elaboração de candidaturas aos Projetos Integrados de I&D (Norte 2020) e aos Programas de Ação Conjunta (Portugal 2020), sendo que os resultados destas últimas candidaturas não são ainda conhecidos.

O modelo dos contratos-programa com empresas, entretanto desenhado, começou a ser operacionalizado. Com a EDP arrancaram em 2015 cinco projetos e foram também iniciadas as atividades de cooperação com a Kyaia e a Biodevices.

Na vertente de lançamento de spin-offs, o INESC TEC pré-incubou dois projetos empresariais: a LTP Labs, que arrancou no início de 2015 a MitMyNid no final mesmo ano.

8 Internacionalização

A quota da atividade em projetos europeus exibida na Figura 2 dá, por si só, uma ideia do nível de internacionalização da instituição. Os 46 projetos europeus em simultâneo evidenciam uma presença europeia muito forte, que se tem vindo a alargar em termos de áreas científicas e de parcerias. Parte deste posicionamento é devido à forte presença em *fora* internacionais, como na área da energia e da indústria transformadora (neste caso, de relevar um papel ativo na Plataforma Tecnológica Manufature e na EFFRA – European Factories of the Future Research Association). Estas são apostas feitas há mais de uma década cujos resultados só são visíveis a médio-longo prazo.

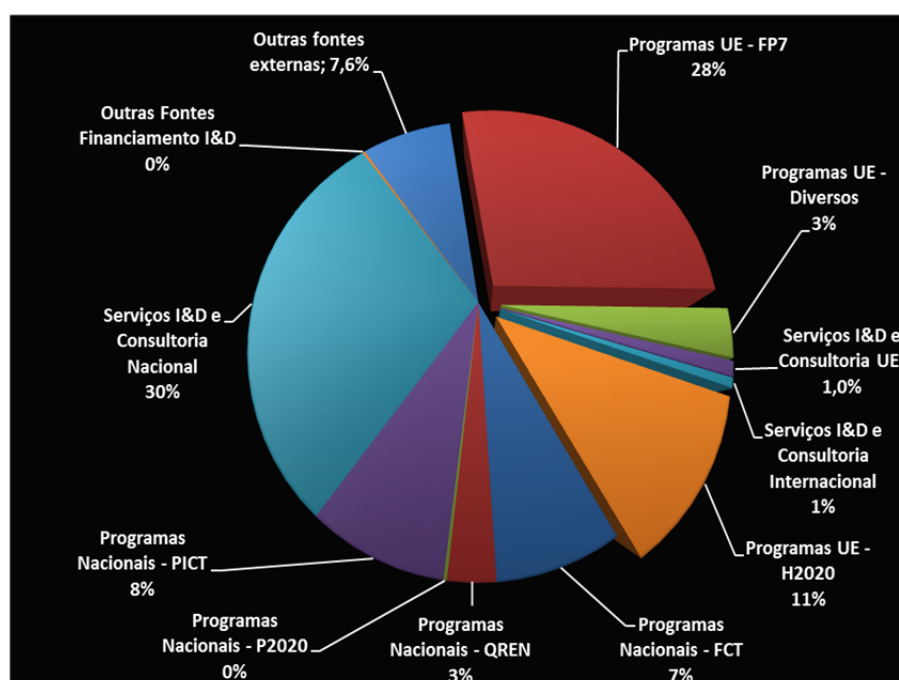


Figura 2 – Repartição de proveitos de projetos por origem de atividade, evidenciando a fração de 44% de origem internacional

Em 2015 foi possível colher os frutos de mais uma aposta estratégica deste tipo, com a entrada do INESC TEC numa candidatura a uma KIC (Knowledge and Innovation Community) na área dos Raw Materials que ganhou o concurso aberto pelo EIT (European Institute of Technology), sendo o único parceiro português. As reconhecidas competências em tecnologia robótica para mineração em minas abandonadas foram a razão do convite para fazer parte do consórcio internacional ganhador da referida KIC.

Também durante 2015 foi desenvolvido trabalho que conduziu à participação do INESC TEC numa candidatura a uma KIC em Added-Value Manufacturing, a submeter até julho 2016.

Tal como é habitual, a instituição acolhe várias Escolas de verão e 2015 não foi exceção. Visum, MAP Breast e ASCOS foram as iniciativas de caráter internacional mais marcante.

9 Contributos para as políticas públicas de Ciência, Tecnologia e Inovação

Os contributos para as políticas públicas fazem parte das competências dos Laboratórios Associados e o INESC TEC tem-se mantido ativo em muitas atividades pro-bono nessa vertente, oferecendo a sua competência científica e técnica e a independência que, em muitos casos, é elemento fundamental.

O acolhimento do Programa CMU Portugal, a colaboração com a InvestPorto na atração de investimento estrangeiro qualificado, a constituição do NEM (New European Media) Portugal, entre outros, são algumas das iniciativas de interesse público em que foi determinante o papel do INESC TEC em 2015.

Em fase de arranque do novo quadro comunitário de apoio, 2015 foi um ano de desenho e colocação no terreno de programas nacionais e regionais para financiamento de atividades de ciência e inovação com recurso a fundos estruturais. Assim, e tal como diversas vezes no passado, foi desenvolvida uma atividade intensa junto dos diferentes níveis de decisão e gestão desses programas, aportando a nossa vasta experiência de terreno para procurar sensibilizar os decisores sobre a necessidade imperiosa de minimizar a burocracia nos programas de apoio à ciência e à transferência de tecnologia. Os frutos (ainda que limitados) desse esforço, de que acabou por beneficiar toda a comunidade, encorajam-nos nessa missão difícil de levar a experiência da execução dos projetos e programas a quem tem a missão de desenhar e implementar as políticas públicas encontrando as melhores soluções, apesar dos espartilhos legais e burocráticos impostos.

10 Comunicação, coesão interna e imagem externa

10.1 Eventos 30 anos

Os eventos organizados no âmbito da comemoração dos 30 anos conferiram grande visibilidade e prestígio à instituição, tendo-se revelado instrumentos importantes para projetar a imagem do INESC TEC a um nível nacional e mostrar o seu impacto económico e social.

De destacar a produção de uma série de 30 documentários exibidos na televisão (RTP3 e RTP Internacional) e disseminados em multiplataforma, a estreia de um ciclo de fóruns INESC TEC – Fórum “INESC TEC do Outono”, que em 2015 se denominou “Economia, Investigação, Desenvolvimento e Inovação”, e ainda a conferência “Instituições de Interface no Sistema do Ensino Superior”, que abordou a intervenção destas instituições no desenvolvimento económico e social de Portugal.

Direcionado a um público mais jovem foi organizado, também no âmbito do 30º aniversário, “O Efeito Eureka”, um evento de carácter irreverente e *out of the box* vocacionado para estudantes de pós-graduação da U. Porto, aberto também à U.Minho, UTAD e IPP, que contou com concursos, *talks* e um desafio social.

Ainda enquadrado na comemoração dos 30 anos teve um impacto assinalável o concerto “a.bel – Nova Música Interativa”, uma estreia mundial que celebrou o impacto da tecnologia na música e reuniu cerca de 800 pessoas na Casa da Música.

De destacar ainda a colaboração com a Faculdade de Belas Artes da Universidade do Porto (FBAUP), materializada na exposição “Evidência da Imagem Tecnológica” com vertentes de fotografia, banda desenhada e intervenção de luz.

Com o objetivo de promover o convívio entre os colaboradores do INESC TEC e reforçar a coesão interna no ano da comemoração dos 30 anos, foi organizado um encontro aberto a famílias que juntou cerca de 250 pessoas na Quinta da Eira em Penafiel.

Não poderia fechar-se este breve sumário, sem destacar a pronta e forte adesão a este programa de celebrações dos 30 anos do INESC no Porto por parte dos associados, dos colaboradores da instituição e dos parceiros empresariais e institucionais. Fica aqui o nosso sincero agradecimento, em especial aos patrocinadores que tornaram possível, com o seu apoio financeiro, um programa desta ambição.

10.2 Assessoria de imprensa

Em 2015 os esforços empreendidos pelo Serviço de Comunicação no sentido de alcançar uma maior visibilidade nos órgãos de comunicação social originaram uma presença mais sustentada do INESC TEC nos principais media em Portugal. Um serviço de monitorização (clipping) contratado para o efeito contabilizou 882 notícias em 2015, mais 578 do que no ano anterior.

Verificando-se que, cada vez mais, os media recorrem aos investigadores para realizar entrevistas e reportagens, o Serviço de Comunicação organizou uma sessão de Media Training intitulada “Como Comunicar com Jornalistas” para reforçar as competências comunicacionais dos investigadores do INESC TEC.

10.3 Rebranding e comunicação externa

Com a alteração dos estatutos e da denominação do INESC Porto para INESC TEC em maio de 2015, deu-se um novo impulso no processo de rebranding, num esforço de eliminar referências ao INESC Porto nos mais diversos suportes, assumindo-se agora em definitivo a marca INESC TEC.

O BIP - Boletim do INESC TEC, disponível em português e inglês no website do INESC TEC e divulgado trimestralmente na sua versão inglesa para Universidades de 25 países, afirma-se como um dos instrumentos mais eficazes de que a instituição dispõe atualmente para comunicar com o exterior. Contagens de acessos ao BIP pelo sistema de geração de estatísticas AWStats permitem aferir o impacto real que este instrumento de comunicação tem. No ano de 2015, por exemplo, o BIP recebeu visitas de 139 países, sendo os mais frequentes Portugal, China, EUA, França, Brasil e Alemanha, num total de 475.908

páginas vistas e de 68.151 visitantes. É importante referir também a presença do INESC TEC nas Redes Sociais – Facebook, LinkedIn, YouTube e Twitter.

O Serviço de Comunicação atualiza a página web do INESC TEC em português e inglês com a inclusão frequente de notícias, eventos e notas de imprensa. Além disso, recebe e trata diariamente questões, pedidos e sugestões enviados através do website, alguns deles com potencial suficiente para se converterem em propostas efetivas de cooperação ou iniciativas conjuntas com empresas.

No âmbito do apoio aos Centros de I&D destacam-se as tarefas de definição de imagem corporativa e comunicação aplicadas a diversos projetos e ainda a produção de filmes promocionais.

10.4 Eventos e visitas

De destacar ainda em 2015 o apoio à participação do INESC TEC em eventos que promoveram a sua imagem no exterior, como foi o caso do Fórum do Ma, Green Business Week, Blue Business Forum, ICT 2015, ISAP 2015, Techdays Aveiro, Open Day CTM ou Workshop “Mobilidade, Transportes e Logística”. O Serviço de Comunicação apoiou igualmente a organização de visitas de empresas/instituições ao INESC TEC.

De referir também o apoio à operacionalização dos patrocínios do INESC TEC a vários eventos, em particular as contrapartidas oferecidas aos patrocinadores, como a organização de stand institucional, produção de suportes de comunicação e angariação de oradores.

10.5 Formação e Comunicação de Ciência

Manteve-se igualmente o empenho na colaboração com a Ciência Viva na divulgação da ciência aos mais jovens, nomeadamente através do acolhimento de alunos na iniciativa Ocupação Científica nas Férias – Jovens Ciência Viva nos Laboratórios para um estágio científico intitulado “À descoberta do meu lado empreendedor”.

De destacar ainda, entre as atividades de sensibilização dos jovens para a área da ciência – vertente de Comunicação De Ciência –, a participação institucional em eventos como a Semana Profissão Engenheiro da FEUP e a Mostra da U.Porto.

Em 2015 foram acolhidos no Serviço de Comunicação três estudantes do 4º ano do curso de Design de Comunicação da Faculdade de Belas Artes da Universidade do Porto (FBAUP), no âmbito do protocolo estabelecido há vários anos com aquela instituição de ensino.

10.6 Comunicação interna e apoio a colaboradores

Com o objetivo de reforçar a coesão interna, o Serviço de Comunicação continuou a promover em 2015 a realização de atividades de grupo, tais como o concurso de fotografia, torneio de futebol, magusto e convívio de Fim de Ano com lanche multicultural.

Assume ainda a tarefa de esclarecer dúvidas e validar o correto uso dos logótipos obrigatórios e das referências aos fundos de financiamento aplicadas a artigos, publicações e outros documentos de divulgação, tais como atas, anúncios, cartazes, folhetos de divulgação, revistas ou monografias.

Por último, importa referir o projeto de seguimento da trajetória dos antigos colaboradores do INESC TEC nas empresas nacionais e internacionais. O CONNECT INESC TEC junta em rede, visível para o exterior através de um website e de página no LinkedIn, 258 antigos colaboradores, espalhados por 23 países, que podem manter-se atualizados sobre as novidades do INESC TEC e comunicar entre si.

11 Dados consolidados institucionais e das atividades em 2015

11.1 Recursos Humanos

11.1.1 Indicadores de Recursos Humanos em 31 dezembro 2015

O quadro seguinte mostra a estrutura de recursos humanos afetos ao INESC TEC, com desagregação por estrutura organizativa interna e tipo de ligação.

Estrutura Organizativa Interna			Tipo de Ligação										Investigadores Colaboradores		Estudantes Formação Inicial		Total Global
			Recursos Humanos Integrados														
			I&D				Estrutura (Central e Local)			Total Integrados							
			Contratados	Docentes Ensino Superior	Bolseiros e Estagiários	Total I&D	Contratados	Bolseiros e Estagiários	Estrutura Outros		Total Estrutura						
I&D	Centros INESC TEC	CTM	5	26	53	84	1	0	0	1	85	18	10	113			
		CAP	5	13	14	32	2	0	0	2	34	10	16	60			
		CESE	12	13	42	67	2	0	0	2	69	7	0	76			
		CPES	13	13	38	64	2	0	0	2	66	9	1	76			
		CSIG	10	21	44	75	1	0	0	1	76	23	1	100			
		CROB	6	29	29	64	3	1	0	4	68	5	3	76			
		CITE	2	1	6	9	0	0	0	0	9	10	4	23			
		CBER	1	9	10	20	0	0	0	0	20	4	5	29			
		LIAAD	0	25	27	52	0	0	0	0	52	27	12	91			
		CRACS	2	13	34	49	1	0	0	1	50	12	2	64			
		CEGI	0	16	37	53	0	0	2	2	55	17	1	73			
		HASLab	0	23	37	60	0	1	4	5	65	8	5	78			
		Sub-Total	56	202	371	629	12	2	6	20	649	150	60	859			
	Projetos Especiais	PE-CMU	0	0	2	2	3	3	0	6	8	0	0	8			
		PE-UTEN	0	0	0	0	0	0	0	0	0	0	0	0			
		Outros	0	0	0	0	0	0	0	0	0	0	0	0			
		Sub-Total	0	0	2	2	3	3	0	6	8	0	0	8			
Total I&D			56	202	373	631	15	5	6	26	657	150	60	867			
Estrutura Central	Administração Alargada		1	9	0	10	3	0	0	3	1	1	14	9			
	Serviços de Apoio	Organização e Gestão	AG	0	0	0	0	2	0	0	0	0	2	0	2		
			AJ	0	0	0	0	0	1	0	0	0	1	0	1		
			CF	0	0	0	0	5	2	0	0	0	7	0	7		
			CG	0	0	0	0	7	0	0	0	0	7	0	7		
			RH	0	0	0	0	3	0	0	0	0	3	0	3		
	Negócio	SAPE	3	0	0	3	1	0	1	1	0	6	0	5			
		SAL	0	0	1	1	1	1	0	0	0	3	0	2			
		GB	0	0	1	1	0	0	0	2	1	4	0	2			
	Apoio Técnico	SCOM	0	0	0	0	2	2	1	0	0	5	0	3			
		SCI	0	0	0	0	3	1	0	0	0	4	0	4			
		SIG	0	0	0	0	3	0	0	0	0	3	0	3			
		SIG	0	0	0	0	3	0	1	0	0	4	0	4			
		SIG	0	0	0	0	3	0	1	0	0	4	0	4			
Sub-Total			3	0	2	5	30	7	3	40	3	3	49	43			
Total Estrutura Central			4	9	2	15	33	7	3	43	4	4	63	52			
Total Global			60	211	375	646	48	12	9	69	715	154	61	930			

11.1.2 Evolução Anual de Indicadores de Recursos Humanos

O quadro seguinte evidencia particularmente a estabilização do número de recursos humanos integrados nos últimos anos, em conformidade com as explicações de evolução da atividade fornecidas noutras secções deste relatório.

Tipo de ligação	Número em Dezembro 2013	Número em Dezembro 2014	Número em Dezembro 2015	Variação (*)
Docentes do Ensino Superior	222	212	211	-1
Contratados	102	100	108	8
Bolseiros	341	387	387	0
Outros	138	165	224	59
Total	803	864	930	66

11.2 Atividade Contratual

Nas secções seguintes, apresentam-se os indicadores consolidados da atividade contratual que decorreu em 2015 no âmbito do INESC TEC. A atividade da Unidade Associada CISTER está apenas reportada na informação complementar que integra a Parte C.

11.2.1 Projetos com Atividade durante o ano de 2015

*Número de Projetos com Atividade em 2015
(Fonte de Financiamento vs. Tipo de Atividade Dominante)*

Fonte de Financiamento	Tipo de Atividade Dominante									Total
	Investigação Básica	Investigação Aplicada e Desenvolvimento	Consultoria	Transferência Tecnologia	Rede Cooperação	Conferência	Formação Avançada	Incubação	Outro	
Programas Nacionais - FCT	28	0	1	0	0	0	0	0	0	29
Programas Nacionais - QREN	5	1	1	0	0	0	0	0	0	7
Programas Nacionais - P2020	3	0	0	0	0	0	0	0	0	3
Programas Nacionais - PICT	14	0	0	0	0	0	0	0	0	14
Programas UE - FP7	21	0	0	1	0	0	1	0	0	23
Programas UE - H2020	10	0	0	0	1	1	0	0	0	12
Programas UE - Diversos	9	0	0	0	1	0	0	0	1	11
Serviços I&D e Consultoria Nacional	5	26	71	0	1	0	0	0	0	103
Serviços I&D e Consultoria União Europeia	1	3	2	1	0	0	0	0	0	7
Serviços I&D e Consultoria Internacional	0	4	0	0	0	0	0	0	0	4
Outras Fontes Financiamento I&D	2	0	1	0	0	0	1	0	1	5
Outras Fontes Externas	0	0	0	0	2	5	2	1	2	12
Interno	0	0	0	0	1	0	0	0	1	2
Total	98	34	76	2	6	6	4	1	5	232

Nota: os valores da coluna total poderão não corresponder à soma dos valores das colunas dos Centros, caso existam projetos com participação de mais que um Centro.

Número de Projetos com Atividade em 2015
 (Fonte de Financiamento vs. Centro)

Tipologia de Projeto			Centros e Grupos INESCP												PE	Total Global
		CTM	CAP	CESE	CPES	CSIG	CROB	CITE	CBER	LIAAD	CRACS	CEGI	Haslab	Total Centros	Projetos Especiais	
Fonte de Financiamento	Programas Nacionais - FCT	5	3	3	2	2	2	1	4	2	6	2		32		32
	Programas Nacionais - QREN	2		3		1	1		1					8		8
	Programas Nacionais - P2020			1			1	1						3		3
	Programas Nacionais - PICT	8	4	3	2	6	3	7	3	9	6	3	3	57	1	58
	Programas UE - FP7	4	1	4	6	3	6			1			3	28		28
	Programas UE - H2020	4	1	3	4		1	2				1	2	18		18
	Programas UE - Diversos	2	3	2		2	3	2		1				15		15
	Serviços I&D e Consultoria Nacional	8	2	21	23	16	5	2	2	2	6	11	4	102	10	112
	Serviços I&D e Consultoria União Europeia	1		2	1		2					1		7		7
	Serviços I&D e Consultoria Internacional				3		1			1				5		5
	Outras Fontes Financiamento I&D		1			1	1		1					4	1	5
	Outras Fontes Externas	2	1		2	1		1		1			1	9	3	12
	Interno				1									1	1	2
Tipo de Atividade Dominante	Investigação Básica	22	11	19	14	14	18	11	9	13	11	9	8	159	1	160
	Investigação Aplicada e Desenvolvimento	8	2	8	6	6	3		2	2	2	1	1	41		41
	Consultoria	3		13	21	11	4	2		1	5	8	3	71	9	80
	Transferência Tecnologia			1			1							2		2
	Rede Cooperação							2						2	4	6
	Conferência	2		1	1					1			1	6		6
	Formação Avançada	1	1		1									3	1	4
	Incubação							1						1		1
	Outro		2		1	1								4	1	5
Estado de Execução	Iniciado no Ano	10	3	11	14	12	5	11	4	9	10	6	5	100		100
	Continuado no Ano	9	4	22	13	11	8	2	1	3	5	2	5	85	13	98
	Iniciado e Finalizado no Ano	2	1		3		5					3	1	15		15
	Finalizado no Ano	15	8	9	14	9	8	3	6	5	3	7	2	89	3	92
Total		36	16	42	44	32	26	16	11	17	18	18	13	289	16	305

11.2.2 Indicadores de Proveitos Projetos com Atividade durante o ano de 2015

Proveitos de Projetos com Atividade em 2015
 (Fonte de Financiamento vs. Tipo de Atividade Dominante vs Unidade)

Tipologia de Projeto		Centros de I&D INESCP														Projetos Especiais		Total (k€)	Distribuição Global (%)
		CTM	CAP	CESE	CPES	CSIG	CROB	CITE	CBER	LIAAD	CRACS	CEGI	HASLAB	Total Centros (k€)	Distribuição (%)	PE	Distribuição (%)		
Fonte de Financiamento	Programas Nacionais - FCT	72	47	63	66	181	18	0	126	1	160	16	0	750	8%	0		750	7%
	Programas Nacionais - QREN	19	0	90	0	8	114	0	52	0	0	0	0	283	3%	0		283	3%
	Programas Nacionais - P2020	0	0	20	0	0	0	0	0	0	0	0	0	20	0%	0		20	0%
	Programas Nacionais - PICT	174	66	136	100	5	101	0	0	52	0	27	0	661	7%	178	23%	839	8%
	Programas UE - FP7	350	14	362	752	201	699	0	0	41	0	0	419	2.838	30%	0		2.838	28%
	Programas UE - H2020	313	13	87	502	0	177	33	0	0	0	19	17	1.161	12%	0		1.161	11%
	Programas UE - Diversos	27	24	76	0	109	0	114	0	0	0	0	0	350	4%	0		350	3,4%
	Serviços I&D e Consultoria Nacional	288	30	436	609	619	138	63	38	73	276	330	130	3.030	32%	0		3.030	30%
	Serviços I&D e Consultoria União Europeia	25	0	44	0	0	0	0	0	0	0	36	0	105	1%	0		105	1,0%
	Serviços I&D e Consultoria Internacional	0	0	0	68	0	0	0	0	0	0	0	0	68	1%	0		68	0,7%
Outras Fontes Financiamento I&D	0	0	0	0	0	4	0	17	0	0	0	0	21	0%	1	0%	22	0,2%	
Outras Fontes Externas	22	28	0	23	39	0	0	0	65	0	0	9	186	2%	594	77%	780	7,6%	
Tipo de Atividade Dominante	Investigação Básica	762	160	756	1.420	506	1.113	53	195	94	151	227	436	5.873	62%	178	23%	6.051	59%
	Investigação Aplicada e Desenvolvimento	310	30	97	290	386	15	0	38	21	186	26	110	1.509	16%	0		1.509	15%
	Consultoria	22	0	355	387	231	123	63	0	52	99	175	20	1.527	16%	0		1.527	15%
	Transferência Tecnologia	0	0	86	0	0	0	0	0	0	0	0	0	86	1%	0		86	0,8%
	Rede Cooperação	0	0	0	0	0	0	94	0	0	0	0	0	94	1%	566	73%	660	6,4%
	Conferência	22	0	20	23	0	0	0	0	65	0	0	9	139	1%	0		139	1,4%
	Formação Avançada	174	28	0	0	0	0	0	0	0	0	0	0	202	2%	1	0%	203	2,0%
	Incubação	0	0	0	0	0	0	0	0	0	0	0	0			0			
Outro	0	4	0	0	39	0	0	0	0	0	0	0	43	0%	28	4%	71	0,7%	
Estado de Execução	Iniciado no Ano	340	13	204	537	285	55	94	20	52	123	82	17	1.822	19%	0		1.822	18%
	Continuado no Ano	359	18	664	848	507	528	33	37	127	253	88	529	3.991	42%	509	66%	4.500	44%
	Iniciado e Finalizado no Ano	22	28	0	51	0	181	0	0	0	0	86	9	377	4%	0		377	4%
	Finalizado no Ano	569	163	446	684	370	487	83	176	53	60	172	20	3.283	35%	264	34%	3.547	35%
Total (k€)		1.290	222	1.314	2.120	1.162	1.251	210	233	232	436	428	575	9.473		773		10.246	
Total Centro / Total Global (%)		13%	2,2%	12,8%	21%	11%	12%	2,0%	2,3%	2,3%	4,3%	4,2%	5,6%	92,5%		7,5%		100%	
Total Projetos INESCP		1.274	219	1.305	2.113	1.162	1.244	210	233	229	436	426	575	9.427	100%	763	99%	10.190	99%
Total Projetos IES Associadas (*)		16	3	9	7		7			3		2		46	0%	10	1%	56	0,5%
Total Proj. IES Assoc. / Total Centro (%)		1%	1%	0,7%	0%	0,0%	1%	0%	0%	1%	0%	0%	0%	0%		1%		0,5%	
Margem Centros Total (k€)		0	0	0	0	0	0	0	0	0	0	0	0			0			

(*) Proveitos de Projetos resultantes da participação de Docentes através da respetiva instituição de vínculo (Projetos QREN, INTERREG e similares)

11.2.4 Evolução Anual de Indicadores de Atividade Contratual

Os quadros de número e proveitos de projetos espelham de forma inequívoca o crescimento da atividade de I&D referida ao longo deste Relatório.

Número de Projetos com Atividade em cada Ano

Fonte de Financiamento	Ano					Variação 2014 - 2015
	2011	2012	2013	2014	2015	
Programas Nacionais	106	95	89	65	53	-18%
Programas União Europeia	28	30	35	31	46	48%
Serviços I&D e Consultoria	103	109	104	113	114	1%
Outras Fontes Financiamento I&D	7	10	6	4	5	25%
Outras Fontes Externas	4	7	8	7	11	57%
Interno	8	8	6	4	2	-50%
Total	256	259	248	224	231	3%

Proveitos de Projetos por Ano (k€)

Fonte de Financiamento	Ano					Variação 2014 - 2015
	2011	2012	2013	2014	2015	
Programas Nacionais	2.283	2.621	2.333	2.660	1.892	-29%
Programas União Europeia	1.519	1.572	2.007	2.834	4.349	53%
Serviços I&D e Consultoria	2.516	2.010	1.753	2.576	3.203	24%
Outras Fontes Financiamento I&D	481	515	50	29	22	-24%
Outras Fontes Externas	58	189	612	442	780	76%
Total	6.857	6.907	6.755	8.541	10.246	20%

Proveitos de Projetos por Ano e Centro (k€)

Ano	Fonte de Financiamento	Centros de I&D INESCP													Projetos Especiais	Total (k€)
		CTM	CAP	CESE	CPES	CSIG	CROB	CITE	CBER	LIAAD	CRACS	CEGI	HASLAB	Sub-Total (k€)	PE	
2011	Programas Nacionais	537	208	367	77	309	107	89		71	148			1.913	370	2.283
	Programas União Europeia	257	17	576	357	300				7	5			1.519		1.519
	Serviços I&D e Consultoria	70	144	361	1.104	295	332	81		4	60		6	2.457	59	2.516
	Outras Fontes Financiamento I&D	75	6		397									478	3	481
	Outras Fontes Externas				54			4						58		58
	Total (k€)	939	375	1.304	1.989	904	439	174		82	213		6	6.425	432	6.857
2012	Programas Nacionais	424	74	502	173	423	208	253		50	212			2.319	302	2.621
	Programas União Europeia	326	43	541	278	185	77	62		40	20			1.572		1.572
	Serviços I&D e Consultoria	139	22	445	651	282	297	24		5	45	54	17	1.981	29	2.010
	Outras Fontes Financiamento I&D	49	22		437	5								513	2	515
	Outras Fontes Externas	82			97			10						189		189
	Total (k€)	1.020	161	1.488	1.636	895	582	349		95	277	54	17	6.574	333	6.907
2013	Programas Nacionais	409	273	486	339	137	238	155	12	15	159			2.223	110	2.333
	Programas União Europeia	431	177	380	434	80	332	55		61	22		35	2.007		2.007
	Serviços I&D e Consultoria	133	117	384	447	438	131	23		8		54	18	1.753		1.753
	Outras Fontes Financiamento I&D		1		40	8								49	1	50
	Outras Fontes Externas	2		62		8								72	540	612
	Total (k€)	975	568	1.312	1.260	671	701	233	12	84	181	54	53	6.104	651	6.755
2014	Programas Nacionais	521	202	468	318	118	278	28	117	42	149	135		2.376	284	2.660
	Programas União Europeia	337	153	386	706	191	523	16		193	23		306	2.834		2.834
	Serviços I&D e Consultoria	271	204	504	499	580	120	47	18	25	31	255	16	2.570	6	2.576
	Outras Fontes Financiamento I&D					12			15					27	2	29
	Outras Fontes Externas	2			15			-3		7				21	421	442
	Total (k€)	1.131	559	1.358	1.538	901	921	88	150	267	203	390	322	7.828	713	8.541
2015	Programas Nacionais	265	#####	309	166	194	233		178	53	160	43		#VALUE!	178	#VALUE!
	Programas União Europeia	690	51	525	1.254	310	876	147		41		19	436	4.349		4.349
	Serviços I&D e Consultoria	313	30	480	677	619	138	63	38	73	276	366	130	3.203		3.203
	Outras Fontes Financiamento I&D						4		17					21	1	22
	Outras Fontes Externas	22	28		23	39				65			9	186	594	780
	Total (k€)	1.290	#####	1.314	2.120	1.162	1.251	210	233	232	436	428	575	#VALUE!	773	#VALUE!
Variação 2014 - 2015	Programas Nacionais	-49%		-34%	-48%	64%	-16%	-100%	52%		7%	-68%			-37%	
	Programas União Europeia	105%	-67%	36%	78%	62%	67%	819%			-100%	42%	53%		53%	
	Serviços I&D e Consultoria	15%	-85%	-5%	36%	7%	15%	34%	111%		790%	44%	713%	25%	-100%	24%
	Outras Fontes Financiamento I&D					-100%			13%					-22%	-50%	-24%
	Outras Fontes Externas	1000%			53%			-100%						786%	41%	76%
	Total	14%		-3%	38%	29%	36%	139%	55%		115%	10%	79%		8%	

11.2.5 Lista de Projetos do ano de 2015

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CTM	MC-WMNs	Manuel Ricardo	INV	PROG - NAC	FCT	PROJ IC&DT		PAR	2012-03	FIN
CTM	SIVIC	José Machado da Silva	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2013-05	FIN
CTM	Creation	João Canas Ferreira	INV	PROG - NAC	FCT	PROJ IC&DT	NAC	PAR	2013-05	CONT
CTM	TWAVE	Henrique Salgado	INV	PROG - NAC	FCT	PROJ IC&DT	NAC	PAR	2014-03	FIN
CTM	SEAD	José Machado da Silva	INV	PROG - NAC	FCT	PROJ CMU	INT	PROP	2014-11	CONT
CTM	RETAIL_PRO	Pedro Miguel Carvalho	DES	PROG - NAC	POR Norte	PROJ CO-PROM	NAC	PAR	2012-09	FIN
CTM	MAT	Paula Viana	INV	PROG - NAC	POR Norte		NAC	PROP	2013-01	FIN
CTM	FOUREYES	Paula Viana	INV	PROG - NAC	NORTE2020		NAC	PROP	2015-07	INI
CTM	BLUECOM+	Rui Lopes Campos	INV	PROG - UE	EEA		UE	PAR	2015-07	INI
CTM	ENDURE	Luís Pessoa	INV	PROG - UE	EEA		UE	PAR	2015-07	INI
CTM	SENSEIVER	Vitor Grade Tavares	FORM	PROG - UE	FP7		UE	PAR	2011-12	FIN
CTM	PICTURE	Jaime Cardoso	INV	PROG - UE	FP7		UE	PAR	2013-02	CONT
CTM	Confine	Rui Lopes Campos	INV	PROG - UE	FP7		UE	PAR	2013-02	FIN
CTM	iBROW	Luís Pessoa	INV	PROG - UE	H2020		UE	PAR	2015-01	INI
CTM	SCREEN	Henrique Salgado	INV	PROG - UE	H2020		UE	PAR	2015-01	INI
CTM	MTGrid	Manuel Ricardo	DES	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2012-09	FIN
CTM	ASSIST	Pedro Miguel Carvalho	DES	SERV - NAC				CONT	2012-11	CONT
CTM	HiperWireless	Henrique Salgado	DES	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
CTM	ARENA	Pedro Miguel Carvalho	DES	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2014-01	CONT
CTM	MDX	Pedro Guedes de Oliveira	DES	SERV - UE				CONT	2014-07	CONT
CTM	PGlobal	Paula Viana	DES	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
CTM	Consultoria	Manuel Ricardo	CONS	SERV - NAC				CONT	2010-01	CONT
CTM	Visum_2015	Ana Maria Rebelo	CONF	O				PROP	2015-03	INI-FIN
CTM	MapBreast	Hélder Filipe Oliveira	CONF	O				PROP	2015-03	INI-FIN
CAP	IORT	Carla Carmelo Rosa	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PAR	2012-05	FIN

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CAP	WineBioCode	José Ramiro Fernandes	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PAR	2012-03	FIN
CAP	Spin_Fonão	José Ramiro Fernandes	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PAR	2013-07	FIN
CAP	Sensing	Paulo Vicente Marques	INV	PROG - NAC	POR Norte		NAC	PROP	2013-01	FIN
CAP	CostActions	José Luís Santos	O	PROG - UE	COST		UE	PROP	2008-01	CONT
CAP	Ecoal-MGT	José Manuel Batista	INV	PROG - UE	INTERREG		UE	PAR	2012-11	FIN
CAP	SNIFFER	Gerardo Aguilar	INV	PROG - UE	FP7		UE	PAR	2013-05	CONT
CAP	TunLas	José Luís Santos	DES	SERV - NAC				CONT	2009-01	CONT
CAP	TunLas	José Luís Santos	DES	SERV - NAC				CONT	2009-01	CONT
CAP	Coop-Transnacional	José Luís Santos	O	OID	COOP TRANSN			PROP	2010-01	CONT
CAP	ASCOS2015	Pedro Jorge		O			INT	PROP	2015-07	INI-FIN
CESE	Serow	José Soeiro Ferreira	INV	PROG - NAC	FCT	PROJ IC&DT	NAC	PAR	2012-01	FIN
CESE	E2Web	Ana Barros	INV	PROG - NAC	FCT	PROJ CMU	INT	PAR	2014-06	CONT
CESE	Micro-Fab	António Correia Alves	INV	PROG - NAC	POR Norte	PROJ CO-PROM	NAC	PAR	2013-07	FIN
CESE	GNOSIS	António Correia Alves	INV	PROG - NAC	POFC	PROJ CO-PROM	NAC	PAR	2014-01	FIN
CESE	PLM4all	António Correia Alves	INV	PROG - NAC	POFC	PROJ CO-PROM	NAC	PAR	2014-01	FIN
CESE	FASCOM	Rui Diogo Rebelo	INV	PROG - NAC	POCI	PROJ CO-PROM	NAC	PAR	2015-10	INI
CESE	SmartManufacturing	Jorge Pinho de Sousa	INV	PROG - NAC	POR Norte		NAC	PROP	2013-01	FIN
CESE	iMAN	Américo Azevedo	INV	PROG - NAC	NORTE2020		NAC	PROP	2015-07	INI
CESE	MOFFS	Alexandra Sofia Marques	INV	PROG - UE	FP7		UE	PAR	2014-01	FIN
CESE	MANTIS	Hugo Ferreira	INV	PROG - UE	H2020		UE	PAR	2015-05	INI
CESE	APPS4aME	Américo Azevedo	INV	PROG - UE	FP7		UE	PAR	2012-12	FIN
CESE	FOCUS	Alexandra Sofia Marques	INV	PROG - UE	FP7		UE	PROP	2014-01	CONT
CESE	EXPLORE	José Carlos Caldeira	TT	PROG - UE	FP7		UE	PROP	2013-09	FIN
CESE	EU-GREAT	Luís Carneiro	INV	PROG - UE	H2020		UE	PAR	2015-01	INI
CESE	WMF2015	Luís Carneiro	CONF	PROG - UE	H2020		UE	PAR	2015-02	INI
CESE	BEinCPPS	César Toscano	INV	PROG - UE	H2020		UE	PAR	2015-10	INI
CESE	IzaroGrey	António Correia Alves	DES	SERV - UE				CONT	2007-01	CONT

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CESE	ParqueEscolar	Luís Guardão	DES	SERV - NAC				CONT	2009-11	CONT
CESE	Creative_Retail	Rui Diogo Rebelo	INV	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2013-06	CONT
CESE	ProdExport	António Correia Alves	CONS	SERV - NAC	POFC / POR	VALE INOV		SUB	2013-07	CONT
CESE	FLUPLAN	Pedro Ribeiro	CONS	SERV - NAC	POFC / POR	VALE INOV		SUB	2013-11	FIN
CESE	COOL	Jorge Pinho de Sousa	DES	SERV - NAC				CONT	2013-12	CONT
CESE	RCE	Luís Carneiro	DES	SERV - NAC	POFC / POR			SUB	2014-01	CONT
CESE	Cap@CIDADE	António Lucas Soares	CONS	SERV - NAC				CONT	2014-08	CONT
CESE	PFF_SIM	Rui Diogo Rebelo	CONS	SERV - NAC				CONT	2014-08	CONT
CESE	N&N-ESPP	António Correia Alves	CONS	SERV - NAC				CONT	2014-08	CONT
CESE	MSAC	António Correia Alves	CONS	SERV - NAC				CONT	2014-07	CONT
CESE	FLOW-SIM-LT	Samuel Moniz	INV	SERV - UE				CONT	2014-11	CONT
CESE	SPI	António Correia Alves	CONS	SERV - NAC				CONT	2014-06	CONT
CESE	Opti-calçado	Rui Diogo Rebelo	CONS	SERV - NAC				CONT	2015-01	INI
CESE	GlassWind	António Correia Alves	DES	SERV - NAC				CONT	2014-12	CONT
CESE	SMARTVALV	Pedro Ribeiro	DES	SERV - NAC				CONT	2014-11	CONT
CESE	BI4UPX	Luís Guardão	DES	SERV - NAC				CONT	2014-12	CONT
CESE	CASMOV2	Luís Guardão	DES	SERV - NAC				CONT	2014-12	CONT
CESE	BM2PIS	António Correia Alves	CONS	SERV - NAC				CONT	2014-12	CONT
CESE	PRODUTECH_Plan	António Correia Alves	CONS	SERV - NAC				CONT	2015-06	INI
CESE	SGM	António Correia Alves	CONS	SERV - NAC				CONT	2015-02	INI
CESE	SmartSL	Rui Diogo Rebelo	CONS	SERV - NAC				CONT	2015-07	INI
CESE	Consultoria	Luís Carneiro	CONS	SERV - NAC				CONT	2009-01	CONT
CPES	Comute-DC	Carlos Moreira	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2013-07	FIN
CPES	SusCity	Manuel Matos	INV	PROG - NAC	FCT	PROJ MIT	INT	PROP	2015-01	INI
CPES	SmartGrids	João Peças Lopes	INV	PROG - NAC	POR Norte		NAC	PROP	2013-01	FIN
CPES	iTESLA	André Madureira	INV	PROG - UE	FP7		UE	PAR	2012-01	CONT
CPES	STABALID	Filipe Joel Soares	INV	PROG - UE	FP7		UE	PAR	2012-10	FIN

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CPES	SuSAINABLE	Luís Seca	INV	PROG - UE	FP7		UE	PAR	2013-01	CONT
CPES	evolvDSO	Manuel Matos	INV	PROG - UE	FP7		UE	PAR	2013-09	CONT
CPES	Hyperbole	Carlos Moreira	INV	PROG - UE	FP7		UE	PROP	2013-09	CONT
CPES	EleCtra	José Nuno Fidalgo	INV	PROG - UE	FP7		UE	PAR	2013-12	CONT
CPES	SENSIBLE	Ricardo Bessa	INV	PROG - UE	H2020		UE	PAR	2015-02	INI
CPES	UPGRID	Luís Seca	INV	PROG - UE	H2020		UE	PAR	2015-02	INI
CPES	AnyPLACE	David Rua	INV	PROG - UE	H2020		UE	PROP	2015-02	INI
CPES	SmarterEMC2	David Rua	INV	PROG - UE	H2020		UE	PAR	2015-02	INI
CPES	EFACEC-DMS	Jorge Correia Pereira	DES	SERV - NAC				CONT	2001-04	CONT
CPES	Enercon-WindStudies	Carlos Moreira	CONS	SERV - NAC				CONT	2007-11	FIN
CPES	EFACEC-OPF	Jorge Correia Pereira	DES	SERV - NAC				CONT	2006-10	FIN
CPES	PROB	José Nuno Fidalgo	CONS	SERV - NAC				CONT	2012-04	CONT
CPES	SCADA-BT	Jorge Correia Pereira	DES	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2012-09	FIN
CPES	Prev_Agreg	Ricardo Bessa	CONS	SERV - NAC				CONT	2013-03	FIN
CPES	Madeirarenov_2014	Luís Seca	CONS	SERV - NAC				CONT	2014-01	CONT
CPES	OTGEN	João Tomé Saraiva	CONS	SERV - NAC				CONT	2014-03	CONT
CPES	3Phase	Jorge Correia Pereira	CONS	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
CPES	Ruanda_Solar	Luís Seca	CONS	SERV - NAC				CONT	2014-05	FIN
CPES	Prev_PRE	Luís Seca	CONS	SERV - NAC				CONT	2014-06	FIN
CPES	Perfis_Perdas_2015	José Nuno Fidalgo	CONS	SERV - NAC				CONT	2014-05	FIN
CPES	PrevSol	Ricardo Bessa	CONS	SERV - NAC				CONT	2014-01	FIN
CPES	SiMicrogrids	Carlos Moreira	CONS	SERV - NAC				CONT	2015-01	INI-FIN
CPES	CP_T_Dinamicas	João Tomé Saraiva	CONS	SERV - NAC				CONT	2015-02	INI
CPES	CVE	Bernardo Amaral Silva	CONS	SERV - NAC				CONT	2015-06	INI-FIN
CPES	ReservaProb	Ricardo Bessa	CONS	SERV - NAC				CONT	2015-10	INI
CPES	Tarif_Dinam_Acores	João Saraiva	CONS	SERV - NAC				CONT	2015-12	INI
CPES	Estim_Invest_Dist	José Nuno Fidalgo	CONS	SERV - NAC				CONT	2015-09	INI

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CPES	Segur_Abast_Madeira	João Saraiva	CONS	SERV - NAC				CONT	2015-10	INI
CPES	Terceira_Renov	Bernardo Amaral Silva	CONS	SERV - NAC				CONT	2015-09	INI
CPES	Meteo_NMP_Forecast	Ricardo Bessa	CONS	SERV - UE				CONT	2015-12	INI
CPES	BIOGAS	João Peças Lopes	CONS	SERV - NAC				CONT	2015-11	INI
CPES	Consultoria	Manuel Matos	CONS	SERV - NAC				CONT	2008-01	CONT
CPES	Parafuzzy	Jorge Correia Pereira	DES	SERV - INT				CONT	2008-09	FIN
CPES	SIMULESP	Jorge Correia Pereira	DES	SERV - INT				CONT	2011-01	FIN
CPES	SECRETS	Luís Seca	DES	SERV - INT				CONT	2013-12	CONT
CPES	CoordEES-UETP	João Peças Lopes	FORM	O			INT	PROP	2007-04	CONT
CPES	ISAP2015	Vladimiro Miranda	CONF	O			INT	PROP	2015-06	INI-FIN
CPES	SGEVL	Carlos Moreira	O	INT				PROP	2014-01	CONT
CSIG	MASSIVE	Maximino Bessa	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2013-01	FIN
CSIG	CE4Blind	João Barroso	INV	PROG - NAC	FCT	PROJ UT Austin	INT	PROP	2015-05	INI
CSIG	AAL4ALL	Ângelo Martins	CONS	PROG - NAC	POFC	PROJ MOBIL	NAC	PAR	2011-01	FIN
CSIG	SIBILA	Rui Barros	INV	PROG - NAC	POR Norte		NAC	PROP	2013-01	FIN
CSIG	NanoStima-RL2	João Barroso	INV	PROG - NAC	NORTE2020		NAC	PROP	2015-07	INI
CSIG	StopDepression	Artur Rocha	INV	PROG - UE	EEA		UE	PAR	2015-04	INI
CSIG	SeaBioData	Artur Rocha	INV	PROG - UE	EEA		UE	PAR	2015-07	INI
CSIG	E-Compared	Artur Rocha	INV	PROG - UE	FP7		UE	PAR	2014-01	CONT
CSIG	CCDRN-EA	António Gaspar	CONS	SERV - NAC				CONT	2010-10	CONT
CSIG	SARA	José Correia	CONS	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2012-05	FIN
CSIG	OASRN	Rui Barros	CONS	SERV - NAC				CONT	2013-01	CONT
CSIG	IPMAPS	Rui Barros	DES	SERV - NAC				CONT	2013-05	CONT
CSIG	3Port	Lino Oliveira	CONS	SERV - NAC				CONT	2013-07	CONT
CSIG	RAIA.TEC	Artur Rocha	DES	SERV - NAC				CONT	2014-01	FIN
CSIG	vCardID	José Correia	DES	SERV - NAC				CONT	2014-01	CONT
CSIG	EYEFY	Rui Barros	DES	SERV - NAC				CONT	2014-01	FIN

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CSIG	InMERSE	Benjamim Fonseca	INV	SERV - NAC				CONT	2014-07	FIN
CSIG	WiderMOS	Rui Barros	DES	SERV - NAC				CONT	2014-09	CONT
CSIG	RTE	José Correia	CONS	SERV - NAC				CONT	2015-05	INI
CSIG	DIGITAVE	Rui Barros	CONS	SERV - NAC				CONT	2015-04	INI
CSIG	DRIW2020	António Gaspar	CONS	SERV - NAC				CONT	2015-12	INI
CSIG	Consultoria	António Gaspar	CONS	SERV - NAC				CONT	2008-01	CONT
CSIG	APDIC	Gabriel David	CONS	OID	GULBENKIA N		NAC	CONT	2013-01	FIN
CSIG	ACESSWEB	Ramiro Gonçalves	O	O				CONT	2015-01	INI
CROB	OCHERA	António Paulo Moreira	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PAR	2013-07	FIN
CROB	ROBARQ	António Paulo Moreira	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PAR	2013-07	FIN
CROB	TURTLE	Eduardo Silva	INV	PROG - NAC	POFC	PROJ CO-PROM	NAC	PAR	2014-01	FIN
CROB	CoopWeld	Germano Veiga	INV	PROG - NAC	NORTE2020	PROJ CO-PROM	NAC	PAR	2015-12	INI
CROB	Cooperation	António Paulo Moreira	INV	PROG - NAC	POR Norte		NAC	PROP	2013-01	FIN
CROB	MarineEye	Eduardo Silva	INV	PROG - UE	EEA		NAC		2015-07	INI-FIN
CROB	ICARUS	Aníbal Matos	INV	PROG - UE	FP7		UE	PAR	2012-02	CONT
CROB	SUNNY	Eduardo Silva	INV	PROG - UE	FP7		UE	PAR	2014-01	CONT
CROB	STAMINA	Germano Veiga	INV	PROG - UE	FP7		UE	PAR	2013-10	CONT
CROB	CARLoS	Germano Veiga	INV	PROG - UE	FP7		UE	PAR	2013-09	FIN
CROB	CLARISSA	Germano Veiga	INV	PROG - UE	FP7		UE	PAR	2014-01	CONT
CROB	VAMOS	Eduardo Silva	INV	PROG - UE	H2020		UE	PAR	2015-02	INI-FIN
CROB	EDA-SAVEWATE	Nuno Cruz	DES	SERV - UE				CONT	2012-01	CONT
CROB	Evologics	Nuno Cruz	TT	SERV - UE				CONT	2013-05	CONT
CROB	SCAN	Eduardo Silva	CONS	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
CROB	AutoClassII	António Paulo Moreira	CONS	SERV - NAC				CONT	2015-01	INI
CROB	Submarino_Whale	António Paulo Moreira	DES	SERV - NAC				CONT	2015-04	INI
CROB	Consultoria	António Paulo Moreira	CONS	SERV - NAC				CONT	2014-01	CONT

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CROB	Demo_Drone	José Miguel Almeida	CONS	SERV - NAC				CONT	2015-05	INI
CROB	SUB.2	Aníbal Matos	DES	SERV - INT				CONT	2012-01	FIN
CROB	CINMarS	Eduardo Silva	INV	OID	ESA				2015-03	INI-FIN
CITE	IN&OUT	Alexandra Xavier	INV	PROG - NAC	NORTE2020		NAC	PAR	2015-12	INI
CITE	STAMAR	Alexandra Xavier	INV	PROG - UE	INTERREG		UE	PAR	2014-03	FIN
CITE	EEN	Alexandra Xavier	REDE	PROG - UE	COSME		UE	PAR	2015-01	INI
CITE	KAM	Alexandra Xavier	REDE	PROG - UE	H2020		UE	PAR	2015-01	INI
CITE	PASS	Alexandra Xavier	CONS	SERV - NAC				CONT	2014-01	FIN
CITE	Consultoria	Alexandra Xavier	CONS	SERV - NAC				CONT	2008-01	CONT
CITE	Let-in	Alexandra Xavier	INC	O				CONT	2008-01	FIN
CBER	VitalResponder2	João Paulo Cunha	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2013-07	FIN
CBER	ASD-MD	João Paulo Cunha	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PAR	2013-07	FIN
CBER	STePMotion	Sandra Silva Mouta	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2014-04	FIN
CBER	VR2Market	João Paulo Cunha	INV	PROG - NAC	FCT	PROJ CMU	INT	PROP	2014-07	CONT
CBER	HERMES	João Paulo Cunha	INV	PROG - NAC	POFC	PROJ CO-PROM	NAC	PAR	2013-07	FIN
CBER	SMILES-1	João Paulo Cunha	INV	PROG - NAC	NORTE2020		NAC	PROP	2015-07	INI
CBER	EcoDrive	João Paulo Cunha	DES	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2014-04	FIN
CBER	Bio-Early	João Paulo Cunha	DES	SERV - NAC				CONT	2015-03	INI
CBER	Re-Learning	Sandra Silva Mouta	INV	OID				CONT	2014-01	FIN
LIAAD	Dynamics	Alberto Pinto	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2012-03	FIN
LIAAD	MAESTRA	João Gama	INV	PROG - UE	FP7		UE	PAR	2014-02	CONT
LIAAD	SEA	Alípio Jorge	CONS	SERV - NAC				CONT	2015-01	INI
LIAAD	ECML/ PKDD	João Gama	CONF	O			INT	PROP	2014-07	CONT
CRACS	ADE	Vítor Santos Costa	INV	PROG - NAC	FCT / POFC	PROJ IC&DT		PROP	2012-03	FIN
CRACS	ABLe	Inês Dutra	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2013-05	FIN
CRACS	Authenticus	Fernando Silva	CONS	PROG - NAC	FCT		NAC	PROP	2013-04	CONT
CRACS	Hyrax	Fernando Silva	INV	PROG - NAC	FCT	PROJ CMU	INT	PROP	2014-04	CONT

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
CRACS	REMINDS	Álvaro Figueira	INV	PROG - NAC	FCT	PROJ UT Austin	INT	PROP	2015-04	INI
CRACS	FOTOCATGRAF	Luís Lopes	INV	PROG - NAC	FCT	PROJ UT Austin	INT	PAR	2015-06	INI
CRACS	NanoStima-RL3	Luís Antunes	INV	PROG - NAC	NORTE2020		NAC	PROP	2015-07	INI
CRACS	NanoStima-RL4	Luís Antunes	INV	PROG - NAC	NORTE2020		NAC	PROP	2015-07	INI
CRACS	DAT	Inês Dutra	DES	SERV - NAC	POFC / POR	PROJ INDIV		SUB	2014-01	CONT
CRACS	MGI	Manuel Eduardo Correia	CONS	SERV - NAC				CONT	2015-01	INI
CRACS	PANF	Fernando Silva	CONS	SERV - NAC				CONT	2015-04	INI
CRACS	Consultoria	Fernando Silva	CONS	SERV - NAC				CONT	2010-01	CONT
CEGI	WholeChain	Bernardo Almada Lobo	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2014-03	FIN
CEGI	StableCargo	José Fernando Oliveira	INV	PROG - NAC	FCT / POFC	PROJ IC&DT	NAC	PROP	2012-04	FIN
CEGI	PSS-DESIGN	Lia Patrício	CONS	SERV - NAC				CONT	2014-02	FIN
CEGI	StorePacks	Pedro Amorim	INV	SERV - NAC				CONT	2014-09	FIN
CEGI	ShortCut	Bernardo Almada Lobo	INV	SERV - NAC				CONT	2014-10	FIN
CEGI	Supply_Chain	Bernardo Almada Lobo	INV	SERV - NAC				CONT	2014-11	CONT
CEGI	ReliabilityEng2	Bernardo Almada Lobo	CONS	SERV - UE				CONT	2014-12	FIN
CEGI	ShortPath	Pedro Amorim	CONS	SERV - NAC				CONT	2015-02	INI
CEGI	BestWare	Pedro Amorim	CONS	SERV - NAC				CONT	2015-03	INI
CEGI	Rent-a-Car-Pricing	Maria Antónia Carravilla	CONS	SERV - NAC				CONT	2015-01	INI-FIN
CEGI	RosaEvolution	Bernardo Almada Lobo	CONS	SERV - NAC				CONT	2015-04	INI-FIN
CEGI	HIDRO	Bernardo Almada Lobo	DES	SERV - NAC				CONT	2015-06	INI-FIN
CEGI	UpGas	Bernardo Almada Lobo	CONS	SERV - NAC				CONT	2015-11	INI
CEGI	Consultoria	Bernardo Almada Lobo	CONS	SERV - NAC				CONT	2014-01	CONT
HASLAB	SMILES	Carlos Baquero	INV	PROG - NAC	NORTE2020		NAC	PROP	2015-07	INI
HASLAB	CoherentPaaS	Rui Carlos Oliveira	INV	PROG - UE	FP7		UE	PAR	2013-10	CONT
HASLAB	Practice	Manuel Barbosa	INV	PROG - UE	FP7		UE	PAR	2013-11	CONT
HASLAB	LeanBigData	Rui Carlos Oliveira	INV	PROG - UE	FP7		UE	PAR	2014-02	CONT
HASLAB	SafeCloud	Rui Carlos Oliveira	INV	PROG - UE	H2020		UE	PROP	2015-09	INI

Centro	Nome Curto	Nome Responsável	Tipo Atividade Dominante	Dados Financiamento			Cooperação		Execução	
				Fonte	Programa	Modalidade	Tipo	Função INESCP	Início	Estado
HASLAB	PaaS	Rui Carlos Oliveira	CONS	SERV - NAC				CONT	2013-09	FIN
HASLAB	PaaS2	Rui Carlos Oliveira	CONS	SERV - NAC				CONT	2014-12	FIN
HASLAB	Consultoria	Rui Carlos Oliveira	CONS	SERV - NAC				CONT	2014-01	CONT
HASLAB	RAMiCS	José Nuno Oliveira	CONF	O					2015-09	INI-FIN
PE	Projet_Innovation	João Claro	INV	PROG - NAC	POR Norte		NAC	PROP	2013-01	FIN
PE	UTEN	José Manuel Mendonça	REDE	SERV - NAC				CONT	2007-11	FIN
PE	PRODUTECH	José Carlos Caldeira	CONS	SERV - NAC				CONT	2010-05	CONT
PE	Consultoria-DIP	José Manuel Mendonça	CONS	SERV - NAC				CONT	2011-01	CONT
PE	Consultoria-JMM	José Manuel Mendonça	CONS	SERV - NAC				CONT	2011-01	CONT
PE	Consultoria-MJL	Mário Jorge Leitão	CONS	SERV - NAC				CONT	2011-01	CONT
PE	Consultoria-JCC	José Carlos Caldeira	CONS	SERV - NAC				CONT	2011-01	CONT
PE	Consultoria-VPM	Vladimiro Miranda	CONS	SERV - NAC				CONT	2011-01	CONT
PE	Consultoria-JPL	João Peças Lopes	CONS	SERV - NAC				CONT	2011-01	CONT
PE	Consultoria-DIL	Maria da Graça Barbosa	CONS	SERV - NAC				CONT	2012-01	CONT
PE	Consultoria-SIG	José Carlos Sousa	CONS	SERV - NAC				CONT	2012-01	CONT
PE	CienciaViva	Sandra Pinto	FORM	OID	CIENCIA VIVA			PROP	2010-06	CONT
PE	ProjUTEN	José Manuel Mendonça	REDE	O			INT	PROP	2010-03	FIN
PE	CMU_Portugal	João Claro	REDE	O			INT	PROP	2013-01	CONT
PE	NCP-NMP	José Carlos Caldeira	O	O				CONT	2014-04	CONT
PE	Plataformas	Luís Carneiro	REDE	INT				PROP	2011-01	CONT

Tipo de Atividade Dominante:

INV – Investigação
 DES – Desenvolvimento
 CONS - Consultoria
 TT – Transferência Tecnologia
 REDE – Rede Cooperação
 CONF - Conferência
 FORM – Formação Avançada
 INC - Incubação
 O - Outra

Fonte:

PROG – NAC – Programas nacionais
 PROG – UE – Programas União Europeia
 SERV - NAC – Serviços de I&D e Consultoria Nacional
 SERV - UE - Serviços de I&D e Consultoria União Europeia
 SERV - INT - Serviços de I&D e Consultoria Internacional
 OID – Outras Fontes de Financiamento
 O – Outras fontes Externas
 INT - Interno

Tipo:

IND – Projeto Individual
 NAC – Cooperação Nacional
 UE – Cooperação Europeia (UE+Países Associados)
 INT – Cooperação Internacional

Função INESCP:

PROP - Proponente
 PAR - Parceiro
 CONT - Contratado
 SUB – Subcontratado
 MEMB - Membro
 O - Outra

11.3 Publicações

A tabela seguinte sintetiza as publicações de 2015 que incluem autores do INESC TEC, evidenciando ainda a variação relativa ao ano anterior.

Quadro resumo de publicações

Tipo de publicação	Número
Artigos em Revistas Internacionais com Júri	276
Atas de conferências Internacionais em eventos com júri e seleção	414
Livros (autor)	7
Capítulos em Livros	35
Publicações (editor)	14
Outras Publicações	38
Total	784

(*) Relativamente ao ano anterior

11.4 Dissertações

A tabela seguinte mostra o número de pós-graduações concluídas em 2015 por membros do INESC TEC.

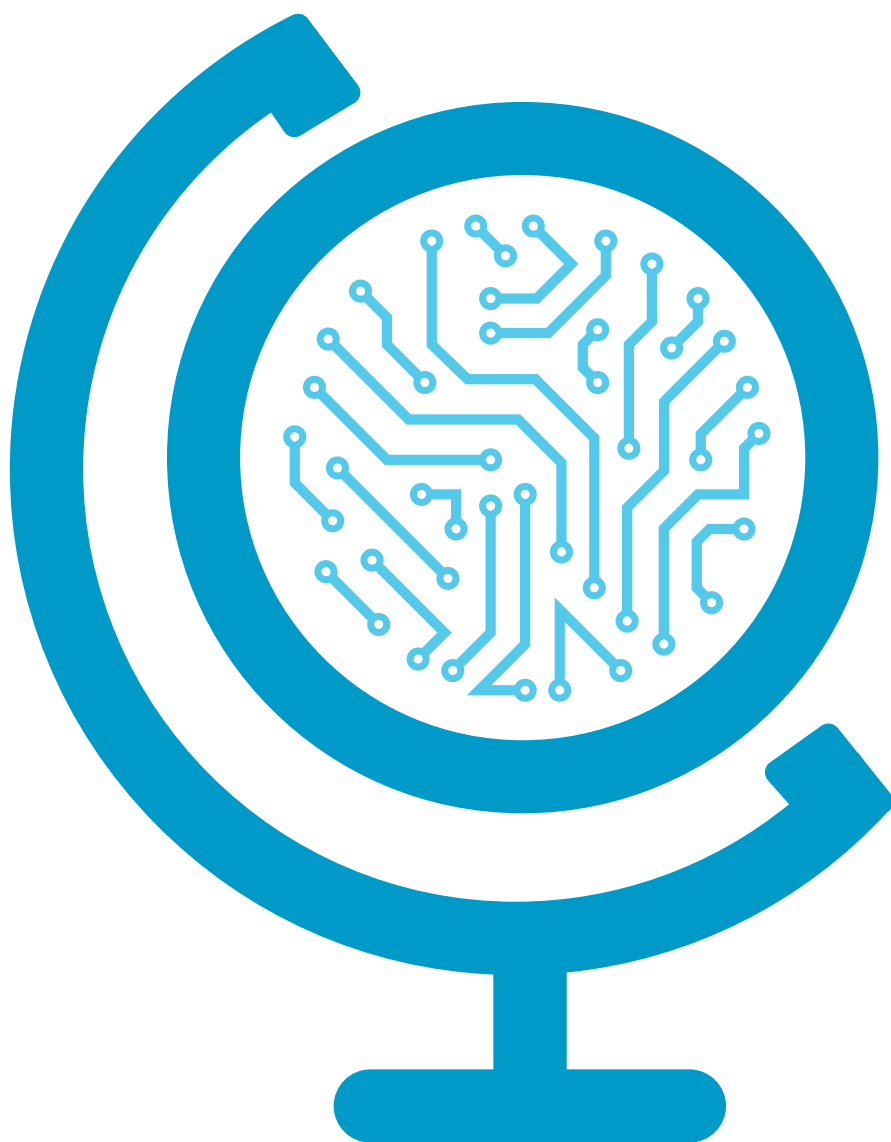
Quadro resumo de pós-graduações

Tipo	Concluídas
Mestrados	453
Doutoramentos	66
TOTAL	519

11.5 Pré-incubação de projetos empresariais

A atividade na área da pré-incubação de empresas/negócios de base tecnológica, na vertente do apoio ao empreendedorismo, é realizada pelo Let-In, Laboratório de Empresas Tecnológicas.

Durante 2015 o Let-in incubou a empresa LPTLABs e apoiou o desenvolvimento da prova de conceito e lançamento de uma nova spin off, MITMYNID. Como parceiro do consórcio português da rede EEN-Portugal e no âmbito do projeto EEN-Innovation, o Let-in apoiou 15 empresas *start up* em fase de *scaling up*, na implementação de processos internos de gestão da inovação.



ORGANIZAÇÃO
INSTITUCIONAL
2015

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1. Dados institucionais do INESC TEC

Tipo de Instituição: Associação privada sem Fins Lucrativos declarada de Utilidade Pública (declaração de utilidade pública em 19/06/2001)

Associados:

- Universidade do Porto (engloba as anteriores participações da FCUP e da FEUP (55,78%)
- INESC – Instituto de Engenharia de Sistemas e Computadores (33,33%)
- Instituto Politécnico do Porto (10,89%)
- Património Associativo: 1.515.000 €
- Site Internet: www.inesctec.pt

2. Localização física

Sede:

Campus da FEUP
Rua Dr. Roberto Frias,
4200-465 Porto
Telef.: 222 094 000
Fax: 222 094 050

Além de Edifícios na FEUP – Faculdade de Engenharia da Universidade do Porto, o INESC TEC tem ainda Polos na FCUP – Faculdade de Ciências da Universidade do Porto, no ISEP – Instituto Superior de Engenharia do Porto, na UTAD – Universidade de Trás-os-Montes e Alto Douro e na UM - Universidade do Minho.

3. Objetivos gerais estatutários

De acordo com a redefinição do seu objeto e atribuições no contexto da alteração dos seus Estatutos em 28 de maio de 2015, o INESC TEC tem visa potenciar a intervenção das instituições suas associadas no desenvolvimento do tecido económico e social, contribuindo para melhorar o desempenho, aumentar a competitividade e alargar o nível de internacionalização das empresas e instituições, através da realização de atividades de investigação científica, de desenvolvimento tecnológico, de transferência e valorização de conhecimento, de qualificação de recursos humanos e de consultoria especializada, tendo como base os domínios nucleares da engenharia eletrotécnica e de computadores e das ciências da computação, com extensão a áreas em que aqueles domínios são relevantes, como a física, a bioengenharia, o ambiente, a gestão e a inovação.

A escolha criteriosa de áreas de intervenção onde possa pautar a sua ação por critérios de excelência científica, inovação, internacionalização e impacto no tecido económico e social, mormente através do

estabelecimento de parcerias estratégicas, é encarada pelo INESC TEC como condição fundamental para a realização da sua missão.

Neste enquadramento, o INESC TEC tem como atribuições:

- Fomentar a utilização de tecnologias avançadas por empresas e instituições, sensibilizando-as para os seus benefícios e apoiando-as na sua implementação, através de consultoria, desenvolvimento de soluções, teste laboratorial, demonstração e formação;
- Transferir conhecimento e soluções inovadoras para as empresas fornecedoras de produtos e serviços de base tecnológica, contribuindo para a sua evolução e para a melhoria da sua oferta;
- Contribuir para a formação de recursos humanos altamente qualificados para o mercado de trabalho, numa perspetiva de complementaridade em relação às instituições de ensino superior, quer através do seu envolvimento em projetos, quer apoiando a realização de estágios, mestrados e doutoramentos integrados nas atividades do INESC TEC;
- Promover a transferência de conhecimentos e a colaboração entre o INESC TEC e o ensino superior, através do envolvimento de docentes e alunos do ensino superior em projetos e atividades conjuntos;
- Estabelecer contratos-programa com entidades públicas ou privadas, visando intervenções estruturadas e programáticas de médio prazo;
- Publicar os resultados da investigação a que se dedica e difundir a cultura científica e tecnológica nas suas áreas de atuação;
- Permutar informações científicas e técnicas com outras instituições afins;
- Promover iniciativas orientadas para o debate sobre experiências e inovações introduzidas no campo da investigação científica e tecnológica, organizando colóquios, seminários, grupos de estudos ou quaisquer outras formas de trabalho coletivo.

4. Laboratório Associado INESC TEC

O INESC TEC – INESC Tecnologia e Ciência tem o estatuto de Laboratório Associado reconhecido pela FCT – Fundação para a Ciência e Tecnologia, agregando nesta qualidade 12 Centros de I&D e uma Unidade Associada denominada CISTER - Centro de Investigação em Sistemas Computacionais Embebidos e de Tempo-Real, esta última gozando de autonomia de governo e não assimilação jurídica.

5. Modelo de organização

Com a alteração dos seus Estatutos, o INESC Porto alterou a sua designação para INESC TEC, demarcando-se da sua circunstância geográfica para abraçar novos desafios mais globais e à altura da sua ambição.

No âmbito dessa alteração dos Estatutos, também o modelo de organização da instituição foi alterado. A organização do INESC TEC passou a incluir um Conselho de Administração, uma Comissão Executiva, e Adjuntos do Conselho de Administração. Mantêm-se inalterados os Serviços de Apoio, constituídos pelos Serviços de Organização e Gestão, Serviços de Desenvolvimento de Negócio e Serviços de Apoio Técnico bem como as estruturas produtivas compostas por 12 Centros de I&D.

Fazem ainda parte da organização da instituição o Conselho de Centros do INESC TEC, como órgão não estatutário, o Conselho Científico a Comissão de Acompanhamento Científico e a Comissão de Acompanhamento Empresarial – esta última ainda por constituir - como órgãos estatutários.

5.1 Conselho Científico

Enquanto órgão estatutário de carácter consultivo, o Conselho Científico do INESC TEC tem como missão estatutária o acompanhamento, orientação e avaliação internos das atividades de carácter científico e técnico, competindo-lhe:

- Pronunciar-se sobre a organização geral das atividades científicas do INESC TEC;
- Analisar e discutir a política científica da instituição e fazer propostas ao Conselho de Administração a esse respeito;
- Monitorizar a atividade e produção científica e fazer propostas ao Conselho de Administração a esse respeito;
- Apresentar ao Conselho de Administração propostas, no âmbito das suas atribuições, sobre quaisquer aspetos relacionados com as atividades do INESC TEC;
- Desempenhar outras funções de gestão científica que lhe sejam confiadas quer pelo Conselho de Administração, quer pelo Conselho Geral.

A organização do Conselho Científico resulta diretamente da estruturação da atividade pelas doze áreas correspondentes aos Centros. Assim, cada Centro tem o seu próprio Conselho Científico interno, constituído por todos os doutorados. O Conselho Científico do INESC TEC, por sua vez, é constituído por um representante efetivo de cada Centro e dois membros designados pelo Conselho de Administração, e ainda alguns membros suplentes, sendo os membros e o respetivo Presidente eleitos pelo Conselho Geral, sob proposta do Conselho de Administração.

Sempre que necessário o Conselho poderá reunir com a extensão ao Laboratório Associado incluindo assim a representação da Unidade CISTER.

O relatório de atividades do Conselho Científico integra o Relatório de Atividade dos Centros.

5.2 Comissão de Acompanhamento Científico

O INESC TEC tem uma Comissão de Acompanhamento Científico (*SAB - Scientific Advisory Board*) que, inclui individualidades externas, nomeadamente cientistas portugueses residentes no estrangeiro e outros membros da comunidade científica internacional. A esta Comissão compete analisar regularmente o funcionamento do INESC TEC e emitir parecer sobre os planos e relatórios de atividades,

bem como analisar criticamente a atividade de I&D, produzindo relatórios periódicos que constituem elementos essenciais de avaliação-correção da estratégia científica da instituição.

5.3 Comissão de Acompanhamento Empresarial

Criada na revisão dos Estatutos de 2015, a Comissão de Acompanhamento Empresarial (*BAB – Business Advisory Board*) será um órgão de carácter consultivo composto por personalidades de reconhecida competência nos setores da economia relevantes para as atividades do INESC TEC. Assim que constituída, competir-lhe-á pronunciar-se e fazer propostas sobre as atividades de ligação às empresas do INESC TEC, nomeadamente nas vertentes de inovação, transferência de tecnologia e formação de recursos humanos para o mercado de trabalho, bem como sobre quaisquer assuntos afins que lhe sejam submetidos pelo Conselho de Administração, salvaguardando as garantias de confidencialidade institucional e de respeito pelas regras da concorrência.

5.4 Conselho de Centros do INESC TEC (CCI)

O conjunto de responsáveis dos Centros reúne quinzenalmente com o Conselho de Administração do INESC TEC num fórum caracterizado pela sua informalidade e discussão aberta sobre diversos assuntos. Ainda que não seja um órgão estatutário, este Conselho constitui uma das bases da cadeia de decisão adotada no INESC TEC, contando também com a presença dos responsáveis de vários serviços de apoio administrativo e técnico.

A este nível são tratados todos os assuntos de despacho corrente, gestão orçamental e assuntos de carácter institucional, tendo a experiência demonstrado ser uma estrutura relativamente leve e eficaz, bem como um fórum essencial de partilha de informação e discussão de problemas e desafios da instituição.

5.5 Administração e Serviços de Apoio

Os Serviços de Apoio incluem quinze estruturas, com um total de trinta e três contratados e sete bolseiros (números a 31/12/2015):

- **Serviços de Organização e Gestão**
 - Apoio Jurídico (AJ)
 - Contabilidade e Finanças (CF)
 - Controlo de Gestão (CG)
 - Recursos Humanos (RH)
 - Apoio à Gestão (AG)
 - Coordenação do Secretariado
- **Serviços de Desenvolvimento de Negócio**
 - Serviços de Apoio a Parcerias Empresariais (SAPE)
 - Serviço de Apoio ao Licenciamento (SAL)
 - Serviço de Apoio à Angariação de Financiamentos (SAAF)
 - Gabinete Brasil (GB)

- Serviços de Apoio Técnico
 - Serviço de Comunicações e Informática (SCI)
 - Serviço de Informática de Gestão (SIG)
 - Serviço de Gestão de Infraestruturas (SGI)
 - Serviço de Comunicação (SCOM)
 - Serviço de Biblioteca e Documentação (SBD)

De observar que tem sido possível fazer face ao grande crescimento da instituição, mantendo controlada a dimensão dos serviços de apoio, e apenas com um aumento marginal tornado inevitável por este acentuado crescimento da instituição.

5.5.1 Serviços de Organização e Gestão

5.5.1.1 Apoio Jurídico (AJ)

Responsável: Maria da Graça Barbosa

Recursos Humanos: duas pessoas (um bolseiro)

O serviço de Apoio Jurídico assegura a assessoria jurídica e a intervenção técnica relativamente a todas as questões de índole jurídica emergentes no universo INESC TEC, nomeadamente nas áreas de recursos humanos, de relacionamento institucional, de contratualização de projetos e de contratação pública de bens e serviços, visando a defesa dos interesses institucionais quer numa ótica preventiva, conformando as atividades que a instituição prossegue com o quadro legislativo nacional e comunitário, ou outro aplicável, quer numa ótica de reparação, minimizando eventuais danos e custos.

5.5.1.2 Contabilidade e Finanças (CF)

Responsável: Paula Faria

Recursos Humanos: sete pessoas (dois bolseiros)

O serviço de Contabilidade e Finanças tem por missão a gestão financeira do instituto, a coordenação e execução das atividades contabilísticas e o cumprimento das demais obrigações de cariz fiscal, assegurando neste contexto a mediação entre o instituto e os seus interlocutores externos, de acordo com as orientações da Administração. A gestão de compras, imobilizado, viagens e seguros são igualmente assumidos por este serviço.

5.5.1.3 Controlo de Gestão (CG)

Responsável: Marta Barbas

Responsável Adjunta: Vanda Ferreira

Recursos Humanos: sete pessoas

O serviço de Controlo de Gestão tem por missão a coordenação e execução das atividades inerentes ao planeamento e controlo orçamental e à produção, coordenação e disseminação da informação de gestão, por forma a assegurar que os recursos são obtidos e usados eficazmente e eficientemente no

cumprimento dos objetivos da instituição. Este serviço inclui ainda a função de acompanhamento da gestão financeira dos projetos.

5.5.1.4 Recursos Humanos (RH)

Responsável: Maria da Graça Barbosa

Responsável adjunta: Margarida Gonçalves

Recursos Humanos: quatro pessoas, uma delas afeta parcialmente

O serviço de Recursos Humanos tem por missão a coordenação e execução de todas as atividades inerentes à gestão administrativa dos recursos humanos e à implementação das políticas com eles relacionadas, de acordo com a lei aplicável, as normas internas e as orientações da Administração.

5.5.1.5 Apoio à Gestão (AG)

Responsável: Maria da Graça Barbosa

Recursos Humanos: duas pessoas, uma delas afeta parcialmente

A função de Apoio à Gestão da Estrutura Central tem por missão promover a articulação entre a administração, os centros e os serviços de apoio, assegurando a integração de processos com vista a garantir, numa ótica de melhoria contínua, uma resposta coordenada por parte da instituição. Atua ainda na preparação e operacionalização das decisões da competência da Administração do INESC TEC, nomeadamente mediante o secretariado ou apoio administrativo a vários órgãos decisores da instituição.

5.5.1.6 Coordenação do Secretariado

Responsável: Lídia Vilas Boas, afeta parcialmente

Tem por missão coordenar o secretariado dos Centros e Serviços, por forma a garantir a coerência nos procedimentos típicos dessa função, bem como assegurar a homogeneidade e controlar o cumprimento de normas e procedimentos internos, em estreita articulação com os vários serviços de organização e gestão.

5.5.2 Serviços de Desenvolvimento de Negócio

Os Serviços de Desenvolvimento e Negócio apoiam a Administração em diversas vertentes estratégicas, como a potenciação do desenvolvimento de novos negócios, a dinamização interna da valorização e transferência de tecnologia e o reforço da prospeção e do apoio a candidaturas.

5.5.2.1 Serviço de Apoio a Parcerias Empresariais (SAPE)

Responsável: Augustin Olivier

Recursos Humanos: quatro pessoas, dois deles afetados parcialmente

O Serviço de Apoio a Parcerias Empresariais tem como missão reforçar a capacidade de oferta de serviços de I&D e consultoria especializada do INESC TEC, tirando nomeadamente vantagem da interdisciplinaridade existente na instituição. Para tal, deve promover uma articulação com os elementos dos diversos Centros, focando-se principalmente na criação de novas oportunidades de negócio em áreas emergentes e na angariação de novos projetos que envolvam competências de vários Centros.

5.5.2.2 Serviço de Apoio ao Licenciamento (SAL)

Responsável: Catarina Maia

Recursos Humanos: três pessoas (dois bolseiros)

O Serviço de Apoio ao Licenciamento tem como principal missão a proteção e o licenciamento de tecnologias do INESC TEC, colaborando de forma estreita com o Apoio Jurídico, o Serviço de Apoio às Parcerias Empresariais, e o CITE. Nesse sentido, o serviço é responsável por estabelecer e gerir os processos de: prospeção interna e comunicação de resultados de investigação passíveis de proteção por direitos de propriedade intelectual; avaliação de estado da arte e de mercado; definição de estratégia de propriedade intelectual; colocação de tecnologia em licenciadores; e negociação e monitorização de contratos de licenciamento.

5.5.2.3 Serviço de Apoio à Angariação de Financiamentos (SAAF)

Responsável: Marta Barbas

Recursos Humanos: duas pessoas, afetas parcialmente

Autonomizado da área de Controlo de Gestão, o Serviço de Apoio à Angariação de Financiamentos tem por missão identificar as oportunidades de acesso aos financiamentos necessários e adequados às atividades de Investigação, Desenvolvimento e Inovação, alinhadas com a missão e com os objetivos estratégicos da instituição. Este serviço deve ainda acompanhar a elaboração e submissão de propostas aos diferentes programas de financiamento em articulação com os Centros de I&D e com os restantes Serviços de Desenvolvimento de Negócio.

5.5.2.4 Gabinete Brasil (GB)

Responsável: Vladimiro Miranda

O Gabinete Brasil foi constituído para organizar de forma sistemática e regular a operação de internacionalização no Brasil, com especial enfoque na identificação de oportunidades, na negociação de contratos e no acompanhamento da execução destes projetos.

5.5.3 Serviços de Apoio Técnico

5.5.3.1 Serviço de Comunicações e Informática (SCI)

Responsável: João Neves

Recursos humanos: quatro pessoas (um bolsheiro)

O Serviço de Comunicações e Informática é responsável pela gestão da rede de comunicações e pelo parque informático.

5.5.3.2 Serviço de Informática de Gestão (SIG)

Responsável: José Carlos Sousa

Recursos humanos: três pessoas

O Serviço de Informática de Gestão é responsável pela conceção, desenvolvimento e operação das aplicações de gestão e de informação da instituição.

5.5.3.3 Serviço de Gestão de Infraestruturas (SGI)

Recursos humanos: cinco pessoas, duas delas afetas parcialmente

Garante as funções genéricas de operação e manutenção dos edifícios, bem como o apoio logístico.

5.5.3.4 Serviço de Comunicação (SCOM)

Responsável: Sandra Pinto

Recursos humanos: quatro pessoas (dois bolsheiros)

Garante as funções de coordenação e gestão da comunicação interna e externa.

5.5.3.5 Serviço de Biblioteca e Documentação (SBD)

As funções de gestão da documentação são asseguradas pela Biblioteca da FEUP, com o apoio de um elemento do secretariado do INESC TEC.

5.6 Estruturas Produtivas

As atividades de I&D desenvolvidas no INESC TEC são organizadas em doze grandes áreas de intervenção, designadas genericamente como Centros de I&D, de acordo com os seguintes princípios:

- cada área de intervenção deve corresponder a um conjunto estruturado de competências tecnologicamente avançadas, reconhecidas nacional e internacionalmente e, simultaneamente, a uma capacidade real de aplicação dessas competências e tecnologias, de forma inovadora;
- cada Centro, deve ser globalmente sustentável, compreendendo uma combinação de atividades de I&D, de desenvolvimento de tecnologia e de prestação de serviços;
- cada Centro deve ter capacidade autónoma de definição de estratégias científicas, assim como de angariação, implementação e gestão de projetos.

Os 12 Centros de I&D do INESC TEC combinam capacidades de I&D e de intervenção no tecido económico (transferência de tecnologia) e são os seguintes:

- CESE: Centro de Engenharia de Sistemas Empresariais
- CAP: Centro de Fotónica Aplicada
- CPES: Centro de Sistemas de Energia
- CSIG: Centro de Sistemas de Informação e de Computação Gráfica
- CTM: Centro de Telecomunicações e Multimédia
- CITE: Centro para a Inovação, Tecnologia e Empreendedorismo
- CROB: Centro de Robótica e Sistemas inteligentes
- C-BER: Centro de Investigação em Engenharia Biomédica
- LIAAD: Laboratório de Inteligência Artificial e Apoio à Decisão
- CRACS: Centro de Investigação em Sistemas Computacionais Avançados
- CEGI: Centro Engenharia e Gestão Industrial
- HASLab - Laboratório de Software Confiável

O modelo organizativo interno de cada uma destas estruturas é diverso, como resultado da sua dimensão, das especificidades das respetivas áreas de intervenção e da qualificação dos seus recursos humanos. No entanto, cada Centro tem um Conselho de Coordenação para partilha das decisões operacionais e estratégicas, com vista a descentralizar a sua gestão e potenciar, internamente, princípios de transparência e subsidiariedade.

5.6.1 CESE: Centro de Engenharia de Sistemas Empresariais

Desenvolve a sua atividade nas áreas de Produção (sistemas de informação avançados de apoio à gestão industrial, gestão da qualidade, gestão da manutenção, sistemas de planeamento e controlo da produção, racionalização e otimização dos processos produtivos, automação, sistemas de apoio à decisão) e Logística (sistemas de gestão de cadeias de fornecimento, planeamento de sistemas logísticos, integração e otimização de estruturas logísticas).

Coordenadores: Jorge Pinho de Sousa e Luís Carneiro

Site Internet: <http://www.inesctec.pt/cese>

5.6.2 CAP: Centro de Fotónica Aplicada

Desenvolve a sua atividade na área da Optoeletrónica, principalmente no campo da tecnologia das fibras óticas. Está orientada para a investigação aplicada e desenvolvimento nas áreas das fontes em fibra ótica, comunicações óticas, sensores em fibra e microfabricação (filmes finos e ótica integrada), procurando também oportunidades para a transferência de tecnologia para a indústria portuguesa através das suas competências específicas em optoeletrónica e integração de sistemas eletrónicos.

Coordenador: Paulo Marques

Coordenador Adjunto: Ireneu Dias

Site Internet: <http://www.inesctec.pt/cap>

5.6.3 CPES: Centro de Sistemas de Energia

Exerce a sua atividade em áreas emergentes essenciais para o setor elétrico: regulação e mercados de eletricidade, integração de produtores independentes dispersos (nomeadamente energia eólica e outras renováveis), gestão técnica e económica de sistemas de distribuição, uso de SIG e outras TI no planeamento energético regional, tratamento da incerteza e risco.

Coordenador: Manuel Matos

Site Internet: <http://www.inesctec.pt/cpes>

5.6.4 CSIG: Centro de Sistemas de Informação e de Computação Gráfica

Estuda, desenvolve e promove soluções integradas no campo dos sistemas de informação e comunicação. O Centro realiza diversos tipos de atividades nomeadamente: desenvolvimento, transferência de tecnologia, consultadoria, auditoria e formação. Estas atividades decorrem em vários setores, salientando-se as telecomunicações, autarquias, indústria, comércio, saúde e administração central e regional.

Coordenadores: Ângelo Martins e António Gaspar

Site Internet: <http://www.inesctec.pt/csig>

5.6.5 CTM: Centro de Telecomunicações e Multimédia

Atua em áreas chave no âmbito das redes e serviços de comunicação, em especial arquiteturas de redes, serviços de telecomunicações, processamento de sinal e imagem, microeletrónica, TV digital e multimédia.

Coordenadores: Manuel Ricardo e Augustin Olivier

Site Internet: <http://www.inesctec.pt/ctm>

5.6.6 CITE: Centro para a Inovação, Tecnologia e Empreendedorismo

Tem como missão criar, aprofundar e difundir práticas de valorização do conhecimento, atuando diretamente: nos processos de Gestão da Inovação; dinamizando e apoiando as atividades de Empreendedorismo (incluindo o social); desenvolvendo atividades de I&D nas áreas da Gestão da Inovação, Transferência de Tecnologia e Empreendedorismo, Inovação e Processos de Internacionalização de empresas, Inovação e Responsabilidade Social empresarial.

Coordenadores: Alexandra Xavier e João Claro

Site Internet: <http://www.inesctec.pt/cite>

5.6.7 CROB: Centro de Robótica e Sistemas Inteligentes

Trabalha no desenvolvimento de conhecimento, conceção e implementação de soluções inovadoras nos domínios da robótica terrestre, robótica aquática, robótica industrial e dos sistemas inteligentes.

Coordenadores: António Paulo Moreira e Eduardo Silva

Site Internet: <http://www.inesctec.pt/crob>

5.6.8 C-BER: Centro de Investigação em Engenharia Biomédica

Tem como missão promover conhecimento através de investigação aplicada, formação avançada e inovação em Engenharia Biomédica, nomeadamente nas três seguintes áreas: BioInstrumentação, Imagem Biomédica e NeuroEngenharia. Coordenadores : João Paulo Cunha e Aurélio Campilho

Site Internet: <http://www.inesctec.pt/cber>

5.6.9 LIAAD: Laboratório de Inteligência Artificial e Apoio à Decisão

Centra a sua atividade em sistemas de apoio à decisão, com particular ênfase nas técnicas de data mining, previsão, modelação adaptativa e otimização, com aplicações em marketing, finanças, escalonamento de processos, saúde, extração de informação de texto, e muitas outras áreas.

Coordenador: Alípio Jorge

Site Internet: <http://www.inesctec.pt/liaad>

5.6.10 CRACS: Centro de Investigação em Sistemas Computacionais Avançados

Desenvolve a sua atividade nas áreas de linguagens de programação, computação paralela e distribuída, data mining, sistemas inteligentes e arquitetura de software, com ênfase na resolução de problemas concretos em áreas de colaboração multidisciplinar, tais como Biologia, Medicina e Química.

Coordenador: Fernando Silva

Site Internet: <http://www.inesctec.pt/cracs>

5.6.11 CEGI: Centro de Engenharia e Gestão Industrial

Centra a sua atividade na fronteira entre a Engenharia, a Gestão e as Ciências Sociais, com o objetivo de identificar processos, técnicas e indicadores de eficiência das instituições. Na base da estratégia desta unidade está o conceito ‘problem-driven research’, que implica o desenvolvimento de soluções ajustadas às necessidades de cada empresa/instituição.

Coordenador: Bernardo Almada-Lobo

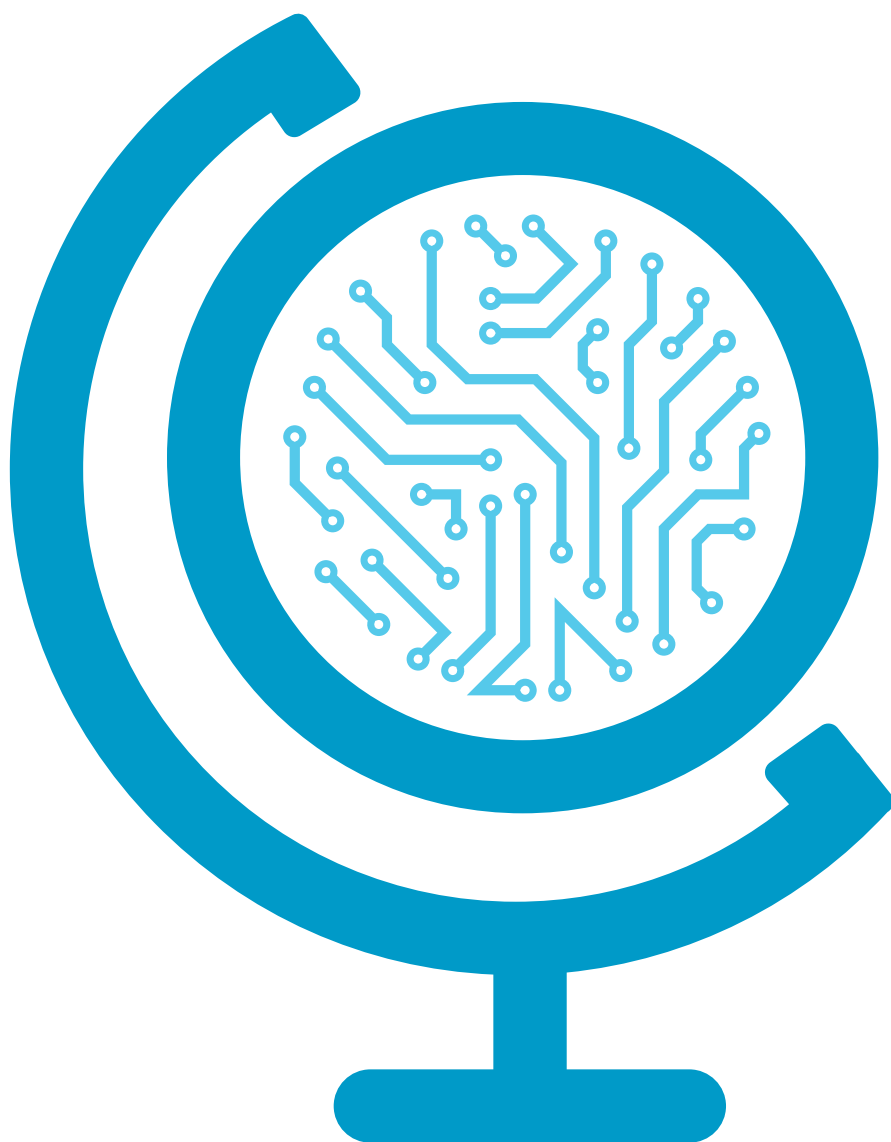
Site Internet: <http://www.inesctec.pt/cegi>

5.6.12 HASLab: Laboratório de Software Confiável

Dedica-se a produzir sistemas de software confiáveis em contextos em que a correção, capacidade de resposta, robustez e segurança são incontornáveis e tipicamente alvo de certificação. Desenvolve investigação integrada em três linhas e aborda os problemas tomando partido da sinergia entre elas: os métodos formais para o desenvolvimento de software, os sistemas distribuídos confiáveis e a segurança de informação.

Coordenador: Manuel Barbosa

Site Internet: <http://www.inesctec.pt/haslab>



INFORMAÇÃO
COMPLEMENTAR
SOBRE A ATIVIDADE
DOS CENTROS
2015

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TELECOMMUNICATIONS AND MULTIMEDIA

A. DESCRIPTION OF THE RESEARCH CENTRE

The Centre for Telecommunications and Multimedia (CTM) of INESC TEC consists of 130 researchers that pursue the CTM mission which includes the development of advanced systems and technologies for enabling the envisioned lively and sustainable world where networked intelligence enables ubiquitous interaction with sensory-rich content. CTM has a cooperative research environment and senior researchers are given scientific autonomy to pursue their objectives, provided that they are aligned with INESC TEC and CTM visions and missions. CTM is scientifically organized in 4 main Research Areas:

- Optical and Eletronic Technologies (OET), addressing research topics related to microwave circuits, antennas, optical communications, microelectronics, and programmable logic. OET aims to develop innovative technologies for optical and wireless communication systems, supported by advanced signal processing techniques, radio devices, design and test of circuits, and reconfigurable digital systems;
- Communications Networks (CN), addressing research topics mostly related to wireless networks. CN aims to extend the Internet to new scenarios including terrestrial, maritime and underground environments with the purpose of enabling the Internet of everything. This includes research on dynamic radio channel assignment and spectrum access combined with cross-layer techniques to enable adaptive radio-aware networks; scalable and traffic-aware routing and topology control techniques, capable of efficiently supporting new types of traffic (from IoT to 4k video); new MAC, routing, and transport protocols tailored to these new scenarios;
- Multimedia Communications Technologies (MCT), addressing topics related to the production, distribution and consumption of multimedia information. MCT aims to radically transform the means by which multimedia content is created, distributed and consumed. The long term vision is towards establishing a vibrant online network of multimedia content where all users can be content creators as well as consumers, or so called “prosumers”; where media is embedded in daily activities, seamlessly enhancing people’s way of living; where media technology becomes transparent and a daily commodity, promoting inclusion and providing universal access to content and resources. Scientifc goals include cross-media information extraction, multimodal user interaction and engagement, user modelling and personalization, content creation for immersive environments but also new business and policy models. MCT aims to address different application areas that include Cultural & Creative Industries, Cinema, TV, Radio, Music, News, Performing Arts, Fashion, Games, Cultural Heritage, Advertising and Tourism.
- Information Processing and Pattern Recognition (IPPR), addressing topics related to computer vision and intelligent information processing. IPPR pursues a never ending audiovisual information learning system, to empower the next generation of intelligent systems with the capability of reasoning from audiovisual data; on the shorter-term IPPR aims to develop computer based algorithms and systems by proposing machine learning architectures inspired in the sensory cortex that attempts to explain the input data from the world by exploiting prior experience with similar data. The new advances are being validated in key applications on the areas of biometry, medical imaging, and human sensing, contributing to a more enjoyable, secure and healthy environment.

CTM is managed by a Coordination Board consisting of the CTM Coordinator and the 4 Area Leaders, which are helped by an assessor and a secretary. The Coordination Board meets every week and it defines, implements and monitors the details of CTM scientific and innovation strategies. This board is advised by the CTM Council which consists of 25 senior CTM researchers, is led by the CTM Coordinator, and meets with a periodicity of three months; the CTM Council discusses strategic topics for CTM, including the definition of long term vision, mission accomplishment, and promotion of events such as the annual CTM open day. There are typically 4 plenary meetings per year in CTM including one meeting for discussion of last year results and another for presenting the next year workplan.

B. MAIN ACHIEVEMENTS

OPTICAL TECHNOLOGIES AND ELECTRONICS

Performance comparison of OFDM and SC-OFDM in Radio-over-fiber systems
Phase conjugated twin waves in few modes fibers
Propagation model accounting for the attenuation of radio electromagnetic waves in underwater
Underwater wireless power transfer
Antennas for underwater radio communications
Polarization diplexer for the 17 GHz band
Frequency converter from the conventional 5.8 GHz band to the 17GHz free band
Novel analog-to-digital transformation for minimum length synthesis of transmission lines
IC design and test, in 130nm, of an UWB LNA.
Design of a novel IR-UWB transmitter in 130nm.
Machine Learning algorithms in hardware for IC security
Circuit design and testing using a-GIZO devices

COMMUNICATIONS NETWORKS

Call Admission Control algorithm for Wireless Mesh Networks based on Power Interference Modeling
Network topology control algorithm for flying backhaul networks
Basic Service Set cascading mechanism for dual-radio 802.11-based Wireless Multi-hop Networks
End-to-end delay estimation algorithm for supporting delay sensitive traffic in Wireless Sensor Networks
Centralized medium access control mechanism for Green 802.11-based Wireless Video Sensor Networks using FM-RDS as control channel
Energy-efficient node selection algorithm for application-driven Wireless Sensor Networks
Development of new ns-3 modules enabling fast prototyping of proactive routing protocols
Cross-Layer Admission Control algorithm to support delay sensitive applications in Wireless Sensor Networks
Design of a reliable link layer protocol for long distance IEEE 802.11n/ac point-to-multipoint communications
ns-3 simulation framework for the evaluation of a reliable link layer protocol over IEEE 802.11 channels
ns-3 routing protocol for enabling large scale network simulation
Two PhD Thesis completed

MULTIMEDIA COMMUNICATIONS TECHNOLOGIES

MAT project selected by the funding agency as a success case
Set up of NEM Portugal (New European Media Portugal), a mirror platform of NEM Europe
A.bel concert at Casa da Musica, presenting technology that transforms the mobile equipment of attendees in instruments that interact with real musicians in the stage (more than 800 attendees)
A platform for an adaptable and personalized context aware system for online multimedia newspaper access in mobile environments
Technology transfer through the deployment in a real operation environment of a system for people detection and localization in retail environments
An integrated environment for sound and music computing and generation
MCT researcher finalist in the Sonae Media Art Prize
Impact in the society through more than 60 references of research results in daily news (TV, radio, newspapers)
Two PhD Thesis completed

INFORMATION PROCESSING AND PATTERN RECOGNITION

Fingerprint recognition algorithm accredited by NIST
System for the prediction of the Popularity of Online News (Best paper award em EPIA 2015)
Algorithm for automatic author identification of documents (first place in an international competition)
Low cost solutions for the planning of Breast Cancer Treatments
A Cognitively Motivated Framework for Partial Face Recognition in Unconstrained Scenarios
Differential Scorecards for Binary and Ordinal data
Livelong Learning Algorithms from Evolving Video Streams in a Multi-Camera Scenario
An AdaBoost variant for Ordinal Classification (Best student paper award em ICPRAM 2015)
Two PhD Thesis completed

C. SUMMARY OF PROJETS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	537	424	409	521	265	-49%
European Union Programmes	257	326	431	337	690	105%
R&D Services and Consulting	70	139	133	271	313	15%
Other R&D sources	75	49				
Other external sources		82	2	2	22	1000%
Total	939	1.020	975	1.131	1.290	14%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	5	14%	72	6%
	National Programmes - QREN	2	6%	19	1%
	National Programmes – P2020				
	National Programmes - PICT	8	22%	174	13%
	European Union Programmes – FP7	4	11%	350	27%
	European Union Programmes – H2020	4	11%	313	24%
	European Union Programmes - Other	2	6%	27	2%
	R&D Services and Consulting - National	8	22%	288	22%
	R&D Services and Consulting – European Union	1	3%	25	2%
	R&D Services and Consulting - International				
	Other R&D sources				
	Other external sources	2	6%	22	2%
	Internal				
Dominant Activity type	Basic Research	22	61%	762	59%
	Applied Research and Development	8	22%	310	24%
	Consulting	3	8%	22	2%
	Technology Transfer				
	Network				
	Conference	2	6%	22	2%
	Advanced Training	1	3%	174	13%
	Incubation				
	Other				
Execution Status	Started	10	28%	340	26%
	Continuation	9	25%	359	28%
	Started and Concluded within the year	2	6%	22	2%
	Concluded	15	42%	569	44%
Total		36		1.290	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	19	18	20	33	33	35
International Conference Proceedings with scientific referees	50	45	42	51	70	50
Books - Author				1		
Chapter in books	2	3	3		5	5
Publications (Editor)	2	2				
Other Publications		13				3
Total	73	81	65	85	108	93

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	74
Doctoral	10
Total	84

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
MC-WMNs	Manuel Ricardo	RES	PROG - NAT	FCT	PROJ IC&DT		PAR	2012-03	FIN
SIVIC	José Machado da Silva	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2013-05	FIN
Creation	João Canas Ferreira	RES	PROG - NAT	FCT	PROJ IC&DT	NAT	PAR	2013-05	CONT
TWAVE	Henrique Salgado	RES	PROG - NAT	FCT	PROJ IC&DT	NAT	PAR	2014-03	FIN
SEAD	José Machado da Silva	RES	PROG - NAT	FCT	PROJ CMU	INT	PROP	2014-11	CONT
RETAIL_PRO	Pedro Miguel Carvalho	DES	PROG - NAT	POR Norte	PROJ CO-PROM	NAT	PAR	2012-09	FIN
MAT	Paula Viana	RES	PROG - NAT	POR Norte		NAT	PROP	2013-01	FIN
FOUREYES	Paula Viana	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START
BLUECOM+	Rui Lopes Campos	RES	PROG - EU	EEA		EU	PAR	2015-07	START
ENDURE	Luís Pessoa	RES	PROG - EU	EEA		EU	PAR	2015-07	START
SENSEIVER	Vitor Grade Tavares	FORM	PROG - EU	FP7		EU	PAR	2011-12	FIN
PICTURE	Jaime Cardoso	RES	PROG - EU	FP7		EU	PAR	2013-02	CONT
Confine	Rui Lopes Campos	RES	PROG - EU	FP7		EU	PAR	2013-02	FIN
iBROW	Luís Pessoa	RES	PROG - EU	H2020		EU	PAR	2015-01	START
SCREEN	Henrique Salgado	RES	PROG - EU	H2020		EU	PAR	2015-01	START
MTGrid	Manuel Ricardo	DEV	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2012-09	FIN
ASSIST	Pedro Miguel Carvalho	DEV	SERV - NAT				CONT	2012-11	CONT
HiperWireless	Henrique Salgado	DEV	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
ARENA	Pedro Miguel Carvalho	DEV	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2014-01	CONT
MDX	Pedro Guedes Oliveira	DEV	SERV - EU				CONT	2014-07	CONT
PGlobal	Paula Viana	DEV	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
Consultoria	Manuel Ricardo	CONS	SERV - NAT				CONT	2010-01	CONT
Visum_2015	Ana Maria Rebelo	CONF	O				PROP	2015-03	START-FIN
MapBreast	Hélder Filipe Oliveira	CONF	O				PROP	2015-03	START-FIN

Dominant Activity Type:

RES – Research
DEV – Development
CONS - Consulting
TT - Technology Transfer
NET - Network
CONF - Conference
TRAIN - Advanced Training
INC - Incubation
O - Other

Source:

PROG – NAT – National Programmes
PROG – EU – European Union Programmes
SERV - NAT - Supply of Services - National
SERV - EU - Supply of Services - European Union
SERV - INT - Supply of Services - International
ORD - Other R&D Services
O - Other External Services
INT - Internal

Type:

IND – Individual Project
NAT - National Cooperation
EU - European Union Cooperation
(EU+Associated Countries)
INT - Internal Cooperation

Role INESCP:

PROP - Proponent
PAR - Partner
CONT - Prime Contractor
SUB - Subcontractor
MEMB - Member
O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Tiburcio,BD, Fernandes,GM, Monteiro,J, Rodrigues,S, Ferreira,M, Facao,M, Ines Carvalho,MI, Pinto,AN, "EIT IN HOLLOW-CORE FIBERS FOR OPTICAL COMMUNICATIONS DEVICES", MICROWAVE AND OPTICAL TECHNOLOGY LETTERS, vol.57, no.2, pp.348-352, FEB, 2015
2. Oliveira,LM, Carvalho,MI, Nogueira,EM, Tuchin,VV, "Diffusion characteristics of ethylene glycol in skeletal muscle", JOURNAL OF BIOMEDICAL OPTICS, vol.20, no.5, pp.051019, MAY, 2015
3. Bahubalindrani,PG, Tavares,VG, Barquinha,P, Duarte,C, Cardoso,N, de Oliveira,PG, Martins,R, Fortunato,E, "a-GIZO TFT neural modeling, circuit simulation and validation", SOLID-STATE ELECTRONICS, vol.105, pp.30-36, MAR, 2015
4. Monteiro,JC, Cardoso,JS, "A Cognitively-Motivated Framework for Partial Face Recognition in Unconstrained Scenarios", SENSORS, vol.15, no.1, pp.1903-1924, JAN, 2015
5. Facao,M, Rodrigues,S, Carvalho,MI, "Temporal dissipative solitons in a three-level atomic medium confined in a photonic-band-gap fiber", PHYSICAL REVIEW A, vol.91, no.1, JAN 20, 2015
6. Paulino,N, Ferreira,JC, Cardoso,JMP, "A Reconfigurable Architecture for Binary Acceleration of Loops with Memory Accesses", ACM TRANSACTIONS ON RECONFIGURABLE TECHNOLOGY AND SYSTEMS, vol.7, no.4, pp.29:1-29:20, JAN, 2015
7. Cardoso,JS, Domingues,I, Oliveira,HP, "Closed Shortest Path in the Original Coordinates with an Application to Breast Cancer", INTERNATIONAL JOURNAL OF PATTERN RECOGNITION AND ARTIFICIAL INTELLIGENCE, vol.29, no.1, pp.1555002, FEB, 2015
8. Xiao,XH, Peng,MF, Cardoso,JS, Tang,RJ, Zhou,YL, "The failure analysis and lifetime prediction for the solder joint of the magnetic head", APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING, vol.118, no.2, pp.691-697, FEB, 2015
9. Oliveira,CC, Sepulveda,AT, Almeida,N, Wardle,BL, da Silva,JM, Rocha,LA, "Implantable Flexible Pressure Measurement System Based on Inductive Coupling", IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING, vol.62, no.2, pp.680-687, FEB, 2015
10. Castro,H, Andrade,MT, Almeida,F, Tropea,G, Melazzi,NB, Mousas,AS, Kaklamani,DI, Chiariglione,L, Difino,A, "Semantically connected web resources with MPEG-21", MULTIMEDIA TOOLS AND APPLICATIONS, vol.74, no.2, pp.439-462, JAN, 2015
11. Soares,M, Viana,P, "Tuning metadata for better movie content-based recommendation systems", MULTIMEDIA TOOLS AND APPLICATIONS, vol.74, no.17, pp.7015-7036, SEP, 2015
12. Otebolaku,AM, Andrade,MT, "Context-aware media recommendations for smart devices", JOURNAL OF AMBIENT INTELLIGENCE AND HUMANIZED COMPUTING, vol.6, no.1, pp.13-36, FEB, 2015
13. Marnerides,AK, Malinowski,S, Morla,R, Kim,HS, "Fault diagnosis in DSL networks using support vector machines", COMPUTER COMMUNICATIONS, vol.62, pp.72-84, MAY 15, 2015
14. Caridade,CMR, Marcal,ARS, Albuquerque,P, Mendes,MV, Tavares,F, "Automatic Analysis of Dot Blot Images", INTELLIGENT AUTOMATION AND SOFT COMPUTING, vol.21, no.4, pp.607-622, OCT 2, 2015
15. Wen,CH, Rebelo,A, Zhang,J, Cardoso,J, "A new optical music recognition system based on combined neural network", PATTERN RECOGNITION LETTERS, vol.58, pp.1-7, JUN 1, 2015
16. Bahubalindrani,PG, Silva,B, Tavares,VG, Barquinha,P, Cardoso,N, Guedes De Oliveira,P, Martins,R, Fortunato,E, "Analog circuits with high-gain topologies using a-GIZO TFTs on glass", IEEE/OSA Journal of Display Technology, vol.11, no.6, pp.547-553, 2015-6, 2015
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19. Sequeira,AF, Cardoso,JS, "Fingerprint Liveness Detection in the Presence of Capable Intruders", *SENSORS*, vol.15, no.6, pp.14615-14638, JUN, 2015
20. Vidal,AA, Tavares,VG, Principe,JC, "An Adaptive Signal Processing Framework for PV Power Maximization", *CIRCUITS SYSTEMS AND SIGNAL PROCESSING*, vol.34, no.9, pp.2973-2992, SEP, 2015
21. Khoshrou,S, Cardoso,JS, Teixeira,LF, "Learning from evolving video streams in a multi-camera scenario", *MACHINE LEARNING*, vol.100, no.2-3, pp.609-633, SEP, 2015
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23. Facao,M, Carvalho,MI, "Existence and stability of solutions of the cubic complex Ginzburg-Landau equation with delayed Raman scattering", *PHYSICAL REVIEW E*, vol.92, no.2, AUG 24, 2015
24. Albuquerque,P, Marcal,ARS, Caridade,C, Costa,R, Mendes,MV, Tavares,F, "A quantitative hybridization approach using 17 DNA markers for identification and clustering analysis of *Ralstonia solanacearum*", *PLANT PATHOLOGY*, vol.64, no.6, pp.1270-1283, DEC, 2015
25. Caridade,CMR, Marcal,ARS, Albuquerque,P, Mendes,MV, Tavares,F, "Automatic Analysis of Dot Blot Images", *Intelligent Automation and Soft Computing*, vol.21, no.4, pp.607-622, 2015-2-19, 2015
26. Pinto,P, Pinto,A, Ricardo,M, "Cross-Layer Admission Control to Enhance the Support of Real-Time Applications in WSN", *IEEE SENSORS JOURNAL*, vol.15, no.12, pp.6945-6953, DEC, 2015
27. Kandasamy,S, Morla,R, Ricardo,M, "Power Interference Modeling for CSMA/CA based Networks using Directional Antenna", *CoRR*, vol.abs/1509.04203, 2015-10-01, 2015
28. Pereira,EM, Cardoso,JS, Morla,R, "Long-Range Trajectories from Global and Local Motion Representations", *CoRR*, vol.abs/1509.08647, 2015-10-01, 2015
29. Jesus,LMT, Martinez,J, Hall,A, Ferreira,A, "Acoustic Correlates of Compensatory Adjustments to the Glottic and Supraglottic Structures in Patients with Unilateral Vocal Fold Paralysis", *BIOMED RESEARCH INTERNATIONAL*, vol.2015, pp.1-9, 2015, 2015
30. Silva,PFB, Cardoso,JS, "Differential scorecards for binary and ordinal data", *INTELLIGENT DATA ANALYSIS*, vol.19, no.6, pp.1391-1408, 2015-11-3, 2015
31. Derogarian,F, Ferreira,JC, Grade Tavares,VMG, "A time synchronization circuit with sub-microsecond skew for multi-hop wired wearable networks", *MICROPROCESSORS AND MICROSYSTEMS*, vol.39, no.8, pp.1029-1038, NOV, 2015
32. Tavares,VG, Duarte,C, de Oliveira,PG, Principe,JC, "Filter & hold: a mixed continuous-/discrete-time technique for time-constant scaling", *INTERNATIONAL JOURNAL OF CIRCUIT THEORY AND APPLICATIONS*, vol.43, no.12, pp.1832-1844, DEC, 2015
33. Amaral,P, Duarte,C, Costa,P, "On the impact of timer resolution in the efficiency optimization of synchronous buck converters", *International Journal of Power Electronics and Drive Systems*, vol.6, no.4, pp.693-702, 2015
34. Beyls,P, Bernardes,G, Caetano,M, "earGram Actors: An Interactive Audiovisual System Based on Social Behavior", *CITAR Journal - Journal of Science and Technology of the Arts*, vol.7, no.1, pp.43, 2015-11-30, 2015
35. Moreira,R, Magalhães,A, Oliveira,H, "A Kinect-Based System for Upper-Body Function Assessment in Breast Cancer Patients", *Journal of Imaging - J. Imaging*, vol.1, no.1, pp.134-155, 2015-11-5, 2015

G.2. International Conference Proceedings with scientific referees

1. Monica,P, Martins,A, Olivier,A, Matos,A, Almeida,JM, Cruz,N, Alves,JC, Salgado,H, Pessoa,L, Jorge,P, Campos,R, Ricardo,M, Pinho,C, Silva,A, Jesus,S, Silva,E, "TEC4SEA - A modular platform for research, test and validation of technologies supporting a sustainable blue economy", 2014 Oceans - St. John's, OCEANS 2014, 2014-9, 2015
2. Barreto,A, Oliveira,R, Sousa,F, Cardoso,A, Duarte,C, "Environment-aware system for Alzheimer's patients", Proceedings of the 2014 4th International Conference on Wireless Mobile Communication and Healthcare - "Transforming Healthcare Through Innovations in Mobile and Wireless Technologies", MOBIHEALTH 2014, pp.300-303, 2015
3. Alizadeh,H, Khoshrou,S, Zuquete,A, "Application-specific traffic anomaly detection using universal background model", IWSPA 2015 - Proceedings of the 2015 ACM International Workshop on Security and Privacy Analytics, Co-located with CODASPY 2015, pp.11-17, 2015, 2015
4. Navarro,M, Caetano,M, Bernardes,G, de Castro,LN, Manuel Corchado,JM, "Automatic Generation of Chord Progressions with an Artificial Immune System", EVOLUTIONARY AND BIOLOGICALLY INSPIRED MUSIC, SOUND, ART AND DESIGN (EVOMUSART 2015), vol.9027, pp.175-186, 2015, 2015
5. Paulino,N, Ferreira,JC, Bispo,J, Cardoso,JMP, "Transparent acceleration of program execution using reconfigurable hardware", Proceedings -Design, Automation and Test in Europe, DATE, vol.2015-April, pp.1066-1071, 2015
6. Paredes,R, Cardoso,JS, Pardo,XM, "Pattern recognition and image analysis: 7th Iberian conference, IbPRIA 2015 Santiago de Compostela, Spain, June 17-19, 2015 proceedings", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9117, 2015-06-09, 2015
7. Pinto,P, Pinto,A, Ricardo,M, "Reducing WSN Simulation Runtime by using Multiple Simultaneous Instances", PROCEEDINGS OF THE INTERNATIONAL CONFERENCE OF NUMERICAL ANALYSIS AND APPLIED MATHEMATICS 2014 (ICNAAM-2014), vol.1648, 2015, 2015
8. Costa,R, Pinto,A, "A framework for the secure storage of data generated in the IoT", Advances in Intelligent Systems and Computing, vol.376, pp.175-182, 2015, 2015
9. Rodrigues,IV, Pereira,EM, Teixeira,LF, "Analysis of Expressiveness of Portuguese Sign Language Speakers", PATTERN RECOGNITION AND IMAGE ANALYSIS (IBPRIA 2015), vol.9117, pp.708-717, 2015, 2015
10. Ferreira,PM, Sequeira,AF, Rebelo,A, "A Fuzzy C-Means Algorithm for Fingerprint Segmentation", PATTERN RECOGNITION AND IMAGE ANALYSIS (IBPRIA 2015), vol.9117, pp.245-252, 2015, 2015
11. Kandaswamy,C, Silva,LM, Cardoso,JS, "Source-Target-Source Classification Using Stacked Denoising Autoencoders", PATTERN RECOGNITION AND IMAGE ANALYSIS (IBPRIA 2015), vol.9117, pp.39-47, 2015, 2015
12. Da Silva,PM, Dias,J, Ricardo,M, "Storm: Rateless MDS erasure codes", Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering, LNICST, vol.146, pp.153-158, 2015-05-21, 2015
13. Moreira,R, Magalhaes,A, Oliveira,HP, "A Kinect-Based System to Assess Lymphedema Impairments in Breast Cancer Patients", PATTERN RECOGNITION AND IMAGE ANALYSIS (IBPRIA 2015), vol.9117, pp.228-236, 2015, 2015
14. Pinto,P, Pinto,A, Ricardo,M, "Delay accounting optimization procedure to enhance end-to-end delay estimation in WSNs", Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering, LNICST, vol.146, pp.14-19, 2015-05-21, 2015
15. Fernandes,K, Cardoso,JS, Fernandes,J, "Temporal Segmentation of Digital Colposcopies", PATTERN RECOGNITION AND IMAGE ANALYSIS (IBPRIA 2015), vol.9117, pp.262-271, 2015, 2015

16. Pereira,EM, Ciobanu,L, Cardoso,JS, "Social Signaling Descriptor for Group Behaviour Analysis", PATTERN RECOGNITION AND IMAGE ANALYSIS (IBPRIA 2015), vol.9117, pp.13-22, 2015, 2015
17. Conceicao,S, Ribeiro,F, Campos,R, Ricardo,M, "A ns-3 based simulator of TCP/IP Wireless Underground Networks", IFIP Wireless Days, vol.2015-January, no.January, pp.1-6, 2014-11, 2015
18. Ferreira,FT, Cardoso,JS, Oliveira,HP, "Video analysis in indoor soccer using a quadcopter", ICPRAM 2015 - 4th International Conference on Pattern Recognition Applications and Methods, Proceedings, vol.1, pp.77-86, 2015
19. Teixeira,J, Teixeira,L, Fonseca,J, Jacinto,T, "Lung function classification of smartphone recordings comparison of signal processing and machine learning combination sets", HEALTHINF 2015 - 8th International Conference on Health Informatics, Proceedings; Part of 8th International Joint Conference on Biomedical Engineering Systems and Technologies, BIOSTEC 2015, pp.123-130, 2015
20. Monteiro,JC, Cardoso,JS, "Periocular recognition under unconstrained settings with universal background models", BIOSIGNALS 2015 - 8th International Conference on Bio-Inspired Systems and Signal Processing, Proceedings; Part of 8th International Joint Conference on Biomedical Engineering Systems and Technologies, BIOSTEC 2015, pp.38-48, 2015
21. Tavares,JS, Pessoa,LM, Salgado,HM, "Phase conjugated twin waves based transmission in few modes fibers", International Conference on Transparent Optical Networks, vol.2015-August, 2015-7, 2015
22. Semprebom,T, Montez,C, Araujo,G, Portugal,P, "A sleep-scheduling scheme for enhancing QoS and network coverage in IEEE 802.15.4 WSN", IEEE International Workshop on Factory Communication Systems - Proceedings, WFCs, vol.2015-July, 2015-5, 2015
23. Martins,M, Portugal,P, Vasques,F, "A framework to support dependability evaluation of WSNs from AADL models", IEEE International Conference on Emerging Technologies and Factory Automation, ETFA, vol.2015-October, pp.1-6, 2015-11-02, 2015
24. Costa,R, Portugal,P, Vasques,F, Montez,C, Moraes,R, "Limitations of the IEEE 802.11 DCF, PCF, EDCA and HCCA to handle real-time traffic", Proceeding - 2015 IEEE International Conference on Industrial Informatics, INDIN 2015, pp.931-936, 2015-10-12, 2015
25. Costa,DG, Silva,I, Guedes,LA, Vasques,F, Portugal,P, "Optimal sensing redundancy for multiple perspectives of targets in wireless visual sensor networks", Proceeding - 2015 IEEE International Conference on Industrial Informatics, INDIN 2015, pp.185-190, 2015-10-12, 2015
26. Teixeira,JF, Couto,M, "Automatic Distinction of Fernando Pessoas' Heteronyms", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.783-788, 2015, 2015
27. Da Silva,PM, Dias,J, Ricardo,M, "CIDRarchy: CIDR-based ns-3 routing protocol for large scale network simulation", SIMUTOOLS 2015 - 8th EAI International Conference on Simulation Tools and Techniques, pp.267-272, 2015, 2015
28. Oliveira,CC, Dias,R, Da Silva,JM, "A fuzzy logic approach for a wearable cardiovascular and aortic monitoring system", Advances in Intelligent Systems and Computing, vol.399, pp.265-274, 2016, 2015
29. Fontes,H, Campos,R, Ricardo,M, "Improving ns-3 emulation support in real-world networking scenarios", SIMUTOOLS 2015 - 8th EAI International Conference on Simulation Tools and Techniques, pp.261-266, 2015, 2015
30. Ren,X, Tavares,VG, Blanton,RDS, "Detection of illegitimate access to JTAG via statistical learning in chip", Proceedings -Design, Automation and Test in Europe, DATE, vol.2015-April, pp.109-114, 2015
31. Fernandes,K, Vinagre,P, Cortez,P, "A Proactive Intelligent Decision Support System for Predicting the Popularity of Online News", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.535-546, 2015, 2015
32. Wang,C, Kim,H, Morla,R, "QoE Driven Server Selection for VoD in the Cloud", Proceedings - 2015 IEEE 8th International Conference on Cloud Computing, CLOUD 2015, pp.917-924, 2015-6, 2015

33. Kianpour,I, Hussain,B, Tavares,VG, Mendonca,HS, "A Low-Power Multi-Tanh OTA with Very Low Harmonic Distortion", 2015 IEEE INTERNATIONAL SYMPOSIUM ON CIRCUITS AND SYSTEMS (ISCAS), vol.2015-July, pp.645-649, 2015-5, 2015
34. Oliveira,CC, Machado Da Silva,J, "A fuzzy logic approach for highly dependable medical wearable systems", Proceedings of the 2015 IEEE 20th International Mixed-Signals Test Workshop, IMSTW 2015, 2015-6, 2015
35. Teixeira,F, Coutinho,N, Figueira,D, Campos,R, Sargento,S, Ruela,J, "UNIT: Multicast using unicast trees", 2015 IEEE International Conference on Communication Workshop, ICCW 2015, pp.2583-2588, 2015-6, 2015
36. Silva,JMD, Oliveira,C, Mendes,B, Dias,R, Marques,T, "Design for dependability and autonomy of a wearable cardiac and coronary monitor", Proceedings - 18th Euromicro Conference on Digital System Design, DSD 2015, pp.567-570, 2015-8, 2015
37. Trindade,IG, Martins,F, Dias,R, Oliveira,C, Machado Da Silva,J, "Novel textile systems for the continuous monitoring of vital signals: Design and characterization", Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBS, vol.2015-November, pp.3743-3746, 2015-8, 2015
38. Khoshrou,S, Cardoso,JS, Granger,E, Teixeira,LF, "Spatio-temporal fusion for learning of regions of interests over multiple video streams", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9475, pp.509-520, 2015, 2015
39. Teixeira,JF, Teixeira,LF, Fonseca,J, Jacinto,T, "Automatic Analysis of Lung Function Based on Smartphone Recordings", BIOMEDICAL ENGINEERING SYSTEMS AND TECHNOLOGIES, BIOSTEC 2015, vol.574, pp.390-402, 2015, 2015
40. Monteiro,JC, Cardoso,JS, "A Novel Application of Universal Background Models for Periocular Recognition", BIOMEDICAL ENGINEERING SYSTEMS AND TECHNOLOGIES, BIOSTEC 2015, vol.574, pp.291-307, 2015
41. Pinto,JP, Viana,P, "Using the Crowd to Boost Video Annotation Processes: A game based approach", ACM International Conference Proceeding Series, vol.24-25-November-2015, 2015, 2015
42. Teixeira,F, Santos,J, Pessoa,L, Pereira,M, Campos,R, Ricardo,M, "Evaluation of Underwater IEEE 802.11 Networks at VHF and UHF Frequency Bands using Software Defined Radios", Proceedings of the 10th International Conference on Underwater Networks & Systems, WUWNET 2015, Arlington, VA, USA, October 22-24, 2015, pp.16:1-16:5, 2015, 2015
43. Teixeira,F, Campos,R, Ricardo,M, "IEEE 802.11 Rate Adaptation Algorithms in Underwater Environment", Proceedings of the 10th International Conference on Underwater Networks & Systems, WUWNET 2015, Arlington, VA, USA, October 22-24, 2015, pp.28:1-28:2, 2015, 2015
44. Conceição,S, Ribeiro,F, Campos,R, Ricardo,M, "Novel ns-3 model enabling simulation of electromagnetic wireless underground networks", Proceedings of the 2015 Workshop on ns-3 - WNS3 '15, 2015, 2015
45. Azad,MA, Morla,R, "ID-CONNECT: Combining network and call features to link different identities of a user", Proceedings - IEEE 18th International Conference on Computational Science and Engineering, CSE 2015, pp.160-167, 2015-10, 2015
46. Wang,C, Kim,HS, Morla,R, "Users Know Better: A QoE Based Adaptive Control System for VoD in the Cloud", 2015 IEEE Global Communications Conference, GLOBECOM 2015, San Diego, CA, USA, December 6-10, 2015, pp.1-6, 2015-12, 2015
47. Siqueira,JDM, Da Silva,JM, Do Paco,TA, "Smart Orchard Irrigation System", 2015 Conference on Design of Circuits and Integrated Systems, DCIS 2015, 2015-11, 2015
48. Gaddam,NK, Da Silva,JM, "Design of a High Efficiency GaN-HEMT RF Power Amplifier", 2015 Conference on Design of Circuits and Integrated Systems, DCIS 2015, 2015-11, 2015

49. Afonso,M, Teixeira,LF, "Experimental Evaluation of the Bag-of-Features Model for Unsupervised Learning of Images", Proceedings of the British Machine Vision Conference 2015, 2015, 2015
50. Teixeira,J, Teixeira,L, Fonseca,J, Jacinto,T, "Lung Function Classification of Smartphone Recordings - Comparison of Signal Processing and Machine Learning Combination Sets", Proceedings of the International Conference on Health Informatics, 2015, 2015

G.3. Books (Author)

(Void)

G.4. Chapter/Paper in Books

1. Viegas,CMD, Vasques,F, Portugal,P, "Real-Time Communication Support in IEEE 802.11-Based Wireless Mesh Networks", - Encyclopedia of Information Science and Technology, Third Edition, pp.7247-7259, 2015, 2015
2. Leão,EM, Vasques,F, Portugal,P, "Supporting Real-Time Communication in Large-Scale Wireless Sensor Networks", - Encyclopedia of Information Science and Technology, Third Edition, pp.7371-7380, 2015, 2015
3. Pinto,P, Pinto,AA, Ricardo,M, "Reducing simulation runtime in wireless sensor networks: A simulation framework to reduce wsn simulation runtime by using multiple simultaneous instances", Handbook of Research on Computational Simulation and Modeling in Engineering, pp.726-741, 2015
4. Salgado,HM, Neto,RE, Pessoa,LM, Batista,PJ, "OFDM and SC-FDMA over Fiber Using Directly Modulated VCSELs", Optoelectronics - Materials and Devices, 2015-10-7, 2015
5. Mendonça,T, Ferreira,P, Marçal,A, Barata,C, Marques,J, Rocha,J, Rozeira,J, "PH2: A Public Database for the Analysis of Dermoscopic Images", Dermoscopy Image Analysis - Digital Imaging and Computer Vision, pp.419-439, 2015-9-10, 2015

G.5. Publications (Editor)

(Void)

G.6. Other Publications

1. Mico,L, Sanches,JM, Cardoso,JS, "The vitality of pattern recognition and image analysis", NEUROCOMPUTING, vol.150, no.PA, pp.124-125, FEB 20, 2015
2. Costa,DG, Guedes,LA, Vasques,F, Portugal,P, "Research Trends in Wireless Visual Sensor Networks When Exploiting Prioritization", SENSORS, vol.15, no.1, pp.1760-1784, JAN, 2015
3. Oliveira,LM, Carvalho,MI, Nogueira,EM, Tuchin,VV, "Diffusion characteristics of ethylene glycol in skeletal muscle (vol 20, 051019, 2015)", JOURNAL OF BIOMEDICAL OPTICS, vol.20, no.5, MAY, 2015

APPLIED PHOTONICS

A. DESCRIPTION OF THE RESEARCH CENTRE

The CAP activity is organized according to four main research areas: Optical Sensors, Integrated Optics and Microfabrication, Advanced Optical Imaging. In this arrangement optical sensors are organized in Chemical/Biosensors and Physical sensors.

Despite the organization of the activities into four main research areas the idea is not to have hermetic areas of research each one with a certain allocation of researchers but the opposite, i.e, research areas that touch and support each other and researchers whose activities touch the different areas of research.

A good example is the Microfabrication section that is exploring traditional top-down microfabrication techniques and non-traditional based on laser direct writing processes to support the activities of other areas. For example, the design of microfluidics chips is being produced for the implementation of micro and nanostructures; Bragg gratings made by laser direct writing are useful to implement new sensing heads and leading to the development of better and more reliable sensing heads.

Finally the Group has a section of which deals with dissemination activities

The dissemination section deals with all the news related to the Research Group, organization of the weekly scientific meetings for the Group (however, outsiders are welcome!), relation with the Department of Physics and Astronomy (DFA) of the Faculty of Science of University of Porto, scientific dissemination to the general public, etc

Of particular importance is the dissemination within the DFA that hosts the Research Group. In the past the Group implemented a lab which provides advanced experiments that are available for Group researchers but also for advanced lectures for Master and Doctoral classes. These activities lead to better prepared students in these topics and widespread interests on many related subjects.

Research Group management

The Centre for Applied Photonics follows, in its internal organization, the general model adopted at INESC TEC. It is governed by a Coordinator and a Coordinating Council composed of 5 to 7 PhDs, having responsibilities over areas of work and research. The project leaders respond to the Coordinating Council in what refers to the execution of projects and meeting financial sustainability goals as well as scientific productivity targets. This Coordinating Council also suggests to the Direction of INESC TEC the form of the participation of CAP in the Communications and Devices cluster coordination.

Each of the research areas has an appointed leader. Ordinary management meetings are held every fortnight to discuss matters related to the research Group daily life, which includes acquisitions, travel, staff and student movements, and project management. The regular attendants to these meetings are the Research Group leader and co-leader together with the leaders of the research areas. Depending on the subjects to be evaluated during the meetings other research group members can be present.

The CAP has a scientific council which is composed of all researchers holding a PhD. The scientific council meets in quarterly meetings to analyse the progress made on the different areas of research and to discuss future work. It is also incumbency of the scientific council to propose new strategic actions.

The main goal of the research group is to innovate with a good equilibrium between purely scientific advances and applied research.

In particular, high level of scientific and technological achievement that should result in higher competitiveness and international recognition is based on specific and adequate infrastructure and resources, a local qualified team and a network of partners that will pursue the supporting funding opportunities.

INTEGRATED OPTICS AND MICROFABRICATION

- Implementation of a tri-dimensional laser direct writing station based on a femtosecond fiber laser system (second and third harmonics).

- Monolithic integrated optic devices in pure silica, chalcogenide glasses, Lithium Niobate, for communications, integrated sensors, astronomical interferometry, quantum cryptography, etc

- Fabrication of Bragg and long period gratings and also explore “fiber-integrated optics”, i.e, using the fiber cladding as the media to write waveguides and devices. Explore multi-core fibers.
- Hybrid devices that combine optical layers with fluids handling capabilities (opto-fluidics made by femtoetching) for sensing.
- Fabrication of tri-dimensional structures using multi-photon polymerization.

PHYSICAL SENSORS

The new strategic plan in the nanosensors field is proposed for the next five years, targeting ultra-high sensitivity sensors. In this part, active devices will be designed in order to improve the precision of physical parameters measurement and to apply in new platform for new areas of research.

- Fabrication of nanofiber using a new high temperature micro-furnace for modification of standard optical fiber
- Study and development of nanostructures fabricated through the FIB technique
- Modelling of photonic crystal structures in waveguides incorporated in special microstructured fiber Comsol multiphysic
- Development of nano-active tapers targetting very high resolution and accuracy employing metamaterials and SPR for refractive index measurement
- Expand the application of ionizing radiation dosimeters from the radiotherapy scenario to the monitoring of radiation in industrial facilities and reinforce medical physics capabilities and sensing.

BIOSENSORS

The main goal of this research plan is to attain a consolidation of the activity in the field of Biosensors using optical technologies and potentiometric measurements:

- Functional fiber tips
- Analytical Imaging. Imaging based sensor platforms for detection with simple camera or microscope exploring functionalized diffractive structures, differential interferometric interrogation, fluorescence etc.
- Combination of metamaterials with functional layers with focus on structural dependent optical properties for high sensitivity sensing
- Laser assisted functionalization, graphene functionalized structures and nanostructures
- Microfluidics: supporting technology to enable sample handling and conditioning
- Potentiometric sensors for food contaminants determination

These works are targeting single cell diagnostic, optogenetics, food industry, environmental (water quality) and safety - bacterial and viral threats, hazardous chemicals.

ADVANCED OPTICAL IMAGING

Compressive sensing based imaging based in single-pixel cameras, targeting applications such as Security and defense, Quality control: spectroscopic/hyperspectral imaging, 3D LIDAR imaging, Pharmaceuticals, Astronomical imaging;

Reinforce local capabilities in high precision optical imaging, grounded on the knowledge acquired in white light interferometry imaging.

Explore medical and bio-sciences using techniques such as Narrow Band Imaging.

DISSEMINATION & INTERNATIONALIZATION

The participation in doctoral programmes, namely MAP-FIS.

Continue to support the 200m2 cleanroom (ISO6/ISO7) of CEMUP-MNTEC.

However, internationalization is where the Group is making the strongest effort since our international relations have to be enhanced in order to increase the participation in European international consortiums. Participation in short term visits, sponsored by bilateral collaboration projects and others, such as COST projects, will be the key aspects leading to more European projects under the Horizon 2020 programme.

B. MAIN ACHIEVEMENTS

Improvements, as well as novel configurations were obtained in the following areas:

- Implementation of Rayleigh scattering for vibration sensing
- Integrated refractometers based on single and multimode interference
- Fiber cavity ring down for remote sensing and data processing analysis
- Evaluation of the performance of orthodontic devices using optical fiber sensors
- OTDR applications for cavity ring down using chirped FBGs
- Demonstration of utility of suspended core fibers in the implementation of high sensitivity optical sensors
- Development of new interrogation schemes with long period gratings
- Development of tapers based on CO₂ Laser
- New Cavity Fabry-Perot based on microstructured tube combined with glass spheres.
- FBG in Focused ion beam for high temperature sensor
- Laser direct writing of first order gratings with femtosecond pulses (point by point)
- Novel optical fiber geometry designs for sensing purposes (H-shaped, suspended twin core fiber, multi-cores fiber as examples)
- Fabrication of waveguides in pure silica through femtosecond laser writing
- Fabrication of refractive index sensors in slotted multimode integrated devices for chemical and biochemical sensing
- Optical fiber sensor for hydrogen and metals
- Sensors for determination of Quaternary Ammonium Compounds
- Sensors for determination of crotaline
- Sensor for B. cereus and cereulide determination
- Design and synthesis of ionic liquids for future bacterial detection
- Microstructured fiber for vapour and liquid sensing
- Wearable Macrobending Fiber Optic Sensor for Human Joint Angle Determination
- Vibration sensor based on a distributed Bragg reflector fibre laser
- Next generation of Fabry-Perot sensors for high-temperature
- Interrogation sensing scheme based on 'Figure-of-Eight' fiber loop mirror configuration
- Temperature-Independent Torsion Sensor Based on 'Figure-of-Eight' Fiber Loop Mirror
- H₂ sensor Based on a Pd-Coated Tapered-FBG Fabricated by DUV Femtosecond Laser Technique
- Wearable Monitoring Unit for Swimming Performance Analysis
- A Fabry-Perot sensor prototype for low-pressure measurements for medical applications
- Optical Inclinator Based on a Phase-Shifted Bragg Grating in a Taper Configuration
- Advanced Fiber-Optic Acoustic Sensors
- An all-fiber Fabry-Pérot interferometer for pressure sensing in different gaseous environments and high temperature applications.
- Evanescent wave DNA-aptamer biosensor based on long period gratings for the specific recognition of E. coli outer membrane proteins
- Development of a metamaterial for the detection of H₂ Gas
- Development of a software platform for potentiometric data acquisition based on node.js.
- Implementation of subroutines for signal analysis in R.
- Implementation of a compact sampling chamber for portable use of the LPG based biosensor/Validation of the LPG biosensors platform in genomic applications (detection of Vitis Vinifera DNA from samples of leaf, grape and wine)
- Design and implementation of a low cost compact optoelectronics platform for interrogation of dCO₂ sensing membranes in field applications of Aquaculture
- Implementation on novel configurations of optical fiber tweezers: polymer based microlenses, vortices structures, Fresnel lens. /Application of new fiber based tweezer in manipulation of cells and cell organel.
- Development of an electrical current sensor prototype for application in high-power lines-Implementation and validation of several magnetic field sensors, based in fiber lasers and magnetorestrictive elements/Implementation of advance interferometric schemes for interrogation of the fiber-laser based sensors.
- Optimization of low cost plasmonic configuration using Modal filtering in multimode plastic optical fibers
- Polymer optical fibers for sensing applications

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	208	74	273	202	113	-44%
European Union Programmes	17	43	177	153	51	-67%
R&D Services and Consulting	144	22	117	204	30	-85%
Other R&D sources	6	22	1			
Other external sources					28	
Total	375	161	568	559	222	-60%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	3	19%	47	24%
	National Programmes - QREN				
	National Programmes – P2020				
	National Programmes - PICT	4	25%	66	34%
	European Union Programmes – FP7	1	6%	14	7%
	European Union Programmes – H2020	1	6%	13	7%
	European Union Programmes - Other	3	19%	24	12%
	R&D Services and Consulting - National	2	13%	30	15%
	R&D Services and Consulting – European Union				
	R&D Services and Consulting - International				
	Other R&D sources	1	6%		
	Other external sources	1	6%	28	14%
	Internal				
Dominant Activity type	Basic Research	11	69%	160	82%
	Applied Research and Development	2	13%	30	15%
	Consulting				
	Technology Transfer				
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other	2	13%	4	2%
Execution Status	Started	3	19%	13	7%
	Continuation	4	25%	18	9%
	Started and Concluded within the year	1	6%	28	14%
	Concluded	8	50%	163	84%
Total		16		194	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	42	53	50	57	40	33
International conference Proceedings with scientific referees	46	38	37	52	54	26
Books - Author						
Chapter in books		2	4		1	
Publications (Editor)			1			
Other Publications		4			2	2
Total	88	97	92	109	97	61

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	3
Doctoral	2
Total	5

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
IORT	Carla Carmelo Rosa	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PAR	2012-05	FIN
WineBioCode	José Ramiro Fernandes	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PAR	2012-03	FIN
Spin_Fonão	José Ramiro Fernandes	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PAR	2013-07	FIN
Sensing	Paulo Vicente Marques	RES	PROG - NAT	POR Norte		NAT	PROP	2013-01	FIN
CostActions	José Luís Santos	O	PROG - EU	COST		EU	PROP	2008-01	CONT
Ecoal-MGT	José Manuel Batista	RES	PROG - EU	INTERREG		EU	PAR	2012-11	FIN
SNIFFER	Gerardo Aguilar	RES	PROG - EU	FP7		EU	PAR	2013-05	CONT
TunLas	José Luís Santos	DES	SERV - NAT				CONT	2009-01	CONT
TunLas	José Luís Santos	DES	SERV - NAT				CONT	2009-01	CONT
Coop-Transnacional	José Luís Santos	O	OID	COOP TRANSN			PROP	2010-01	CONT
ASCOS2015	Pedro Jorge		O			INT	PROP	2015-07	START-FIN

Dominant Activity Type:

RES – Research
 DEV – Development
 CONS - Consulting
 TT - Technology Transfer
 NET - Network
 CONF - Conference
 TRAIN – Advanced Training
 INC - Incubation
 O - Other

Source:

PROG – NAT – National Programmes
 PROG – EU – European Union Programmes
 SERV - NAT - Supply of Services - National
 SERV - EU - Supply of Services - European Union
 SERV - INT - Supply of Services - International
 ORD - Other R&D Services
 O - Other External Services
 INT - Internal

Type:

IND – Individual Project
 NAT - National Cooperation
 EU - European Union Cooperation
 (EU+Associated Countries)
 INT - Internal Cooperation

Role INESCP:

PROP - Proponent
 PAR - Partner
 CONT - Prime Contractor
 SUB - Subcontractor
 MEMB - Member
 O - Other

G. LIST OF PUBLICATIONS

G.1. International Journal with scientific referees

- Gouveinhas,I, Machado,N, Carvalho,T, de Almeida,JMMM, Barros,AIRNA, "Short wavelength Raman spectroscopy applied to the discrimination and characterization of three cultivars of extra virgin olive oils in different maturation stages", TALANTA, vol.132, pp.829-835, JAN 15, 2015
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- Xavier,J, Fernandes,JRA, Frazao,O, Morais,JJL, "Measuring mode I cohesive law of wood bonded joints based on digital image correlation and fibre Bragg grating sensors", COMPOSITE STRUCTURES, vol.121, pp.83-89, MAR, 2015

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10. Rocco Giraldi,MTMR, Fernandes,CS, Ferreira,MS, de Sousa,MJ, Jorge,P, Costa,JCWA, Santos,JL, Frazao,O, "FIBER OPTIC DISPLACEMENT SENSOR BASED ON A DOUBLE-REFLECTING OTDR TECHNIQUE", MICROWAVE AND OPTICAL TECHNOLOGY LETTERS, vol.57, no.6, pp.1312-1315, JUN, 2015
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12. Viveiros,D, Ferreira,J, Silva,SO, Ribeiro,J, Flores,D, Santos,JL, Frazao,O, Baptista,JM, "Ammonia sensing system based on wavelength modulation spectroscopy", Photonic Sensors, vol.5, no.2, pp.109-115, 2015-4-12, 2015
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16. Miranda Rocco Giraldi,MTMR, Fernandes,CS, Ferreira,MS, de Sousa,MJ, Jorge,PAS, Weyl Albuquerque Costa,JCWA, Campos Oliveira Santos,JLCO, Frazao,O, "Fiber Loop Mirror Sensors Interrogated and Multiplexed by OTDR", JOURNAL OF LIGHTWAVE TECHNOLOGY, vol.33, no.12, pp.2580-2584, JUN 15, 2015
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18. Ferreira,MS, Roriz,P, Bierlich,J, Kobelke,J, Wondraczek,K, Aichele,C, Schuster,K, Santos,JL, Frazao,O, "Fabry-Perot cavity based on silica tube for strain sensing at high temperatures", OPTICS EXPRESS, vol.23, no.12, pp.16063-16070, JUN 15, 2015

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21. Rodrigues Ribeiro,RSR, Soppera,O, Oliva,AG, Guerreiro,A, Jorge,PAS, "New Trends on Optical Fiber Tweezers", JOURNAL OF LIGHTWAVE TECHNOLOGY, vol.33, no.16, pp.3394-3405, AUG 15, 2015
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23. Cennamo,N, Coelho,L, Santos,DF, Baptista,JM, Guerreiro,A, Jorge,PAS, Zeni,LG, "Modal Filtering for Optimized Surface Plasmon Resonance Sensing in Multimode Plastic Optical Fibers", IEEE SENSORS JOURNAL, vol.15, no.11, pp.6306-6312, NOV, 2015
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G.2. International Conference Proceedings with scientific referees

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2. Silva,V, Marques,M, Moreira,J, Ramos,I, "Effects of Radiofrequencies in Magnetic Resonance Imaging - a short review", SHO2015: INTERNATIONAL SYMPOSIUM ON OCCUPATIONAL SAFETY AND HYGIENE, pp.365-367, 2015
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4. Janeiro,R, Flores,R, Ribeiro,AR, Jorge,P, Viegas,J, "Focused Ion beam 3D nano-patterned optical fiber tips for advanced beam profile engineering", ADVANCED FABRICATION TECHNOLOGIES FOR MICRO/NANO OPTICS AND PHOTONICS VIII, vol.9374, 2015-3-13, 2015
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7. Coelho,L, Viegas,D, Santos,JL, Marques Martins de Almeida,JMMM, "Monitoring of high refractive index edible oils using coated long period fiber grating sensors", OPTICAL SENSORS 2015, vol.9506, 2015-5-5, 2015
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20. Ferreira,MS, Roriz,P, Bierlich,J, Kobelke,J, Wondraczek,K, Aichele,C, Schuster,K, Santos,JL, Frazao,O, "Measuring strain at extreme temperatures with a Fabry-Perot optical fiber sensor", 24TH INTERNATIONAL CONFERENCE ON OPTICAL FIBRE SENSORS, vol.9634, 2015-9-28, 2015
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23. Viveiros,D, Ribeiro,J, Ferreira,J, Lopez Aldaba,A, Pinto,AMR, Perez Herrera,RA, Diaz,S, Lopez Gil,A, Dominguez Lopez,A, Esteban,O, Martin Lopez,S, Auguste,JL, Jamier,R, Rougier,S, Silva,SO, Frazao,O, Santos,JL, Flores,D, Roy,P, Gonzalez Herraes,M, Lopez Amo,M, Baptista,JM, "Fiber Optic Sensing System for Temperature and Gas Monitoring in Coal Waste Pile Combustion Environments", 24TH INTERNATIONAL CONFERENCE ON OPTICAL FIBRE SENSORS, vol.9634, 2015-9-28, 2015
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25. Marques,MB, Rosa,CC, Marques,PVS, "Eight year experience in open ended instrumentation laboratory", EDUCATION AND TRAINING IN OPTICS AND PHOTONICS: ETOP 2015, vol.9793, 2015-10-8, 2015
26. Rodrigues,M, Marques,MB, Simeao Carvalho,PS, "Measuring and teaching light spectrum using Tracker as a spectrometer", EDUCATION AND TRAINING IN OPTICS AND PHOTONICS: ETOP 2015, vol.9793, 2015-10-8, 2015

G.3. Books (Author)

(Void)

G.4. Chapter/Paper in Books

(Void)

G.5. Publications (Editor)

(Void)

G.6. Other Publications

1. Miguel Lopez Higuera,JM, Jones,J, Lopez Amo,M, Santos,JL, "SPECIAL ISSUE ON INTERNATIONAL CONFERENCE ON OPTICAL FIBER SENSORS Introduction", JOURNAL OF LIGHTWAVE TECHNOLOGY, vol.33, no.12, pp.2342-2343, JUN 15, 2015
2. Carvalho,L, Roriz,P, Simoes,J, Frazao,O, "New Trends in Dental Biomechanics with Photonics Technologies", APPLIED SCIENCES-BASEL, vol.5, no.4, pp.1350-1378, DEC, 2015

ENTERPRISE SYSTEMS ENGINEERING

A. DESCRIPTION OF THE RESEARCH CENTRE

CESE follows, in its internal organization, the general model adopted at INESC TEC. It is governed by two Coordinators and a Coordinating Council including 5 PhDs and 4 senior area leaders, having responsibilities over the areas of research and consultancy.

The project leaders respond to the Coordinating Council in what refers to the execution of projects and meeting financial sustainability goals as well as scientific productivity targets. This Coordinating Council also suggests to the Board of INESC TEC the form of the participation of CESE in the Industry and Innovation cluster coordination.

A dedicated administrative and secretarial support is in place

The Centre is structured in the following four main RESEARCH VECTORS:

- 1 – Operations Management and Logistics
- 2 – Collaborative Networks
- 3 – Decision Support and Business Analytics
- 4 – Enterprise Information Systems

An additional area for consultancy and technology transfer complements the research activities, mainly with the purpose of supporting the transfer and valorisation of the research results, and of identifying new research opportunities arising from real business environments.

The Centre is committed to conduct high quality research, with a strong application focus, responding to new technical and scientific challenges with clear industrial and social relevance. Research activities are related to Operations Management / Operations Research and Enterprise Information Systems, applied to industrial companies and business networks.

Research objectives in Operations Management and Logistics:

they are related to methods and tools for the optimization of complex and dynamic production systems, including the inter-relations in the life cycle of products, processes, and resources, from design and engineering to recycling/disposal and re-use. The research lines to be explored will address highly adaptive systems allowing dynamic reactions to order-driven production environments. Another research line will address the development of approaches to assess the performance of complex manufacturing environments, with the design of innovative performance estimation models.

Research objectives in the collaborative networks area:

they include governance models for business communities, IT platforms for focused collaboration and knowledge management, simulation models for performance management or network operations design, models for the network process formation and for networking support policies. This research requires a deep empirical knowledge on inter-organizational networking. Following previous work in the area, a research line is being setup for this type of projects. Another research direction will be to explore the technologies of linked data and business analytics in the design and management of collaborative networks. Exploratory work is already being done within this topic.

Research objectives in the Decision Support and Business Analytics area:

the research recently initiated in the Centre, to integrate business intelligence and analytics methods, will be consistently pursued. This research will address several areas in data sciences, including data warehousing, data mining, web mining, text mining, social network analysis, recommender systems, stream mining, in-database mining, model management and data science project management and methodologies. Successful applications of these general approaches are expected in many sectors.

Research objectives in the Enterprise Information Systems area:

- on another direction, the design of advanced decision support approaches, based on the integration of simulation, optimization, and multi-criteria techniques, is not only a way to tackle complex, high impact operations management and logistics problems, but also an excellent opportunity for setting up new innovative research projects. Building up from a rich previous experience, several application domains will be favoured, in supply-chain management and design, in manufacturing systems, in internal logistics, or in operations scheduling and planning. But emergent research areas will also be fostered such as logistics and multi-modal transportation systems, distribution problems, or vehicle routing.

B. MAIN ACHIEVEMENTS

During the period under analysis (2015) the centre has reinforced its strong links with industry while increasing its scientific output. In terms of publication in peer-reviewed journals, the group has published 14 journal papers in 2015. Another 15 papers were published in indexed proceedings of international conferences with full-paper review.

3 PhD theses were concluded during the period, strongly contributing to the positive scientific performance of the group.

The centre has a strong tradition of participation in large European research projects. These projects have highly contributed to achieving critical mass in the fields of Enterprise Collaborative Networks and Operations Management and to strengthening partnerships with leader research organisations in Europe. During this period the group has initiated 3 new H2020 projects, and 9 remain active, representing a total funding of about 525 K Euro.

The very active participation in the MANUFUTURE European Technology Platform led to the establishment of important partnerships at a European level. These partnerships have played an important role in the preparation and set-up of several European projects that strongly contributed to the results of the group.

At the national level, including research projects funded by FCT, RTD projects in partnership with technology based companies and consultancy firms funded by the P2020 programme, a total of 11 projects were active, representing a total funding of 204 KEuros.

During the period under analysis a total of 13 research, development and consulting projects directly contracted by companies were active, representing a total income of 355 k Euros.

A number of relevant outcomes can be highlighted:

- In the European project STAMINA "Sustainable and Reliable Robotics for Part Handling in Manufacturing Automation" (a collaboration with another INESC TEC centre - CRIS), a software component Logistic Planner was developed allowing the technicians responsible for logistic supermarkets in the automotive industry to model the geometry and location of physical objects in the space (racks, small and large boxes, conveyors and kitting boxes) and subsequently to provide this logistic world model to a fleet of robots that aim to pick automotive parts stored in the logistic supermarket and to build kitting boxes that are then sent to the assembly line. The component defines service oriented interfaces through which interactions with the robot fleet are established in order to plan, assign and monitor the execution of robots' missions.
- In the Portuguese project Adira MicroFábrica - a Portuguese co-funded collaborative R&D project between INESC TEC, INEGI and ADIRA - a mobile factory in set of containers dedicated to the manufacturing of metal sheet based products was designed and built. The main achievement was the development of a bundle of IT applications dedicated to the architecture configuration of each mobile factory instance, upon the characteristics of the products to be manufactured (number and type of machines, number of containers), remote production planning and management of the MICROFACTORY and tele-maintenance of critical equipment.
- Under the PLM4all project, an innovative low cost IT web platform for mechatronic products complete lifecycle management was developed. This was a Portuguese co-funded collaborative R&D project between INESC TEC, INEGI, DREAMO and ADIRA that designed, developed, implemented and tested a tool dedicated to the management of activities throughout the life cycle of complex mechatronic products, (machinery for metal sheet processing, composed with mechanical, electronic and software), covering the phases of ideation, engineering design, manufacturing, use, maintenance, retrofitting and end of life. The main achievement was the development of the systemic concept approach for product design, that rationalizes and normalizes the use of common components between different product families and development of a interoperability stub capable to transfer and record product structures from CAD tools to ERP systems.
- The apps4aME - an European project that aimed to develop engineering applications for advanced manufacturing engineering, has set out to produce a set of engineering applications and an integrating architecture to support the shift from mass production to on-demand production. The project addressed the

problem associated with the difficulty of conventional IT systems adapting to support the application needs of changing situation. While all the required data is within the system, getting it in the form required can be difficult and/or time consuming. In the Apps4aME paradigm, tablet and smartphone devices are ubiquitous in the shop floor environment and aim to speed the design to manufacturing process by providing appropriate information to each domain in the design-to-manufacture process.

- During this period, the centre has collaborated with VW Autoeuropa implementing an innovative approach and tool to calculate key performance indicators in the industrial management department, mainly related to productivity. A number of relevant outcomes can be highlighted: a novel application was designed and developed (hybrid process manager), to support the management of knowledge intensive collaborative environments; the application was implemented at VW Autoeuropa plant with quite good results. The collaboration with VW Autoeuropa has added real value for VW Autoeuropa, reducing substantial effort to calculate KPIs and eliminating errors on the calculation process. This process fostered the good relations between the centre and the company and several peer-reviewed scientific articles were produced and published in international conferences and journals resulting from this collaboration.

- The Newalk project aimed at researching a Flexible and Integrated Logistic system - FlexiFlowSupplyProduction - a novel concept supporting the storage and distribution of materials and components in a shoe manufacturing production system. It enables to manage, store and distribute an high mix of materials, in a pair-to-pair production logic, coping with the growing diversity of shoe models that compose the today's collections.

- In the research line on predictive maintenance, the centre has completed the GNOSIS project, by completing the Big Data infrastructure to predict anomalous events in stone cutting machines. The infrastructure collects the data using Hadoop/Spark technology, manages predictive models to maximize the quality of the predictions generated using SPARK MLlib and R technologies and implemented an interface to provide those predictions using RESTful technology. We have also conducted empirical studies to analyze the data collected. In the MANTIS project, we have continued this line of work by consolidating and extending the data collection and storage infrastructure, improving the model management techniques and applying to a different case study, with machining equipment.

- Forecasting future sales is one of the most important issues that is beyond all strategic and planning decisions in effective operations of retail businesses. For profitable retail businesses, accurate demand forecasting is crucial in organizing and planning production, purchasing, transportation and labor force. In a collaborative work with the Jerónimo Martins Group the forecasting performance of several models was studied using fixed and rolling schemes to generate forecasts. The empirical results show that the global forecast accuracy can be improved with a multi-model system that automatically selects the best prediction model for each SKU.

- Also in the forecasting topic, this time applied to the wireless networks management research area, and in the context of a collaboration with CTM Centre of INESC TEC, a statistic model was specified to establish a relationship between an improved metric to quantize the interference of the network and the throughput. The model can be used to predict the performance of networks similar to IEEE 802.11 based wireless networks and to decide the best configuration a network operator could use for planning his network.

- In January 2015, CESE organized the first edition of the Innovation in Aeronautics Roundtables under the theme "Fostering Global Supply Networks for the Aeronautics Industry in Portugal", within the scope of the project of the CMU Portugal Program E4value (<http://www.cmuportugal.org/tiercontent.aspx?id=5222>). This Workshop gathered the project's partners with companies and associations to discuss the challenges of the Portuguese aeronautic sector and establish lines of cooperation. Another research cooperation has been established with the University of Warwick, to study supply network configurations in the Global Aeronautic industry. This cooperation has resulted, so far, in the preparation and submission of one journal paper and one conference paper. Also, during 2015 the collaboration with the Carnegie Mellon University was extended from Pittsburgh to the Silicon Valley Campus. This collaboration has been focused on the study of startups in the wearable technologies industry, in collaboration with C-BER in the project of the CMU Portugal Program VR2Market (<http://www.cmuportugal.org/tiercontent.aspx?id=5238>).

- Several relevant consulting projects with multinational companies have been successfully initiated and concluded this year. It should be emphasized the contract-based services delivered to IKEA Industry Portugal and Lithuania, and to Yazaki Saltano. These projects represent an intensification of the services activity oriented to the design of factories and operations planning, which has been effectively sustained by the research work performed by PhD and Master Students. For a Portuguese SME, a low-cost Automated Guided Vehicle easy to install and use as well as highly configurable and was developed. This AGV concept is prone to be generalised to other SMEs as it can be software integrated with the organisation's management systems. In another contract, a tool to estimate the reliability of eolic turbines using advanced statistical models was developed. The tool promptly identifies the factors affecting the reliability of these equipment's.

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	367	502	486	468	309	-34%
European Union Programmes	576	541	380	386	525	36%
R&D Services and Consulting	361	445	384	504	480	-5%
Other R&D sources						
Other external sources			62			
Total	1.304	1.488	1.312	1.358	1.314	-3%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	3	7%	63	5%
	National Programmes - QREN	3	7%	90	7%
	National Programmes – P2020	1	2%	20	2%
	National Programmes - PICT	3	7%	136	10%
	European Union Programmes – FP7	4	10%	362	28%
	European Union Programmes – H2020	3	7%	87	7%
	European Union Programmes - Other	2	5%	76	6%
	R&D Services and Consulting - National	21	50%	436	33%
	R&D Services and Consulting – European Union	2	5%	44	3%
	R&D Services and Consulting - International				
	Other R&D sources				
	Other external sources				
	Internal				
Dominant Activity type	Basic Research	19	45%	756	58%
	Applied Research and Development	8	19%	97	7%
	Consulting	13	31%	355	27%
	Technology Transfer	1	2%	86	7%
	Network				
	Conference	1	2%	20	2%
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	11	26%	204	16%
	Continuation	22	52%	664	51%
	Started and Concluded within the year				
	Concluded	9	21%	446	34%
Total		42		1.314	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	9	6	16	15	8	38
International Conference Proceedings with scientific referees	24	36	35	40	17	14
Books - Author						
Chapter in books	1		1	5	4	9
Publications (Editor)				1		
Other Publications				0	1	3
Total	34	42	52	61	30	64

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	39
Doctoral	3
Total	42

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
Serow	José Soeiro Ferreira	RES	PROG - NAT	FCT	PROJ IC&DT	NAT	PAR	2012-01	FIN
E2Web	Ana Barros	RES	PROG - NAT	FCT	PROJ CMU	INT	PAR	2014-06	CONT
Micro-Fab	António Correia Alves	RES	PROG - NAT	POR Norte	PROJ CO-PROM	NAT	PAR	2013-07	FIN
GNOSIS	António Correia Alves	RES	PROG - NAT	POFC	PROJ CO-PROM	NAT	PAR	2014-01	FIN
PLM4all	António Correia Alves	RES	PROG - NAT	POFC	PROJ CO-PROM	NAT	PAR	2014-01	FIN
FASCOM	Rui Diogo Rebelo	RES	PROG - NAT	POCI	PROJ CO-PROM	NAT	PAR	2015-10	START
SmartManufacturing	Jorge Pinho de Sousa	RES	PROG - NAT	POR Norte		NAT	PROP	2013-01	FIN
iMAN	Américo Azevedo	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START
MOFFS	Alexandra Sofia Marques	RES	PROG - EU	FP7		EU	PAR	2014-01	FIN
MANTIS	Hugo Ferreira	RES	PROG - EU	H2020		EU	PAR	2015-05	START
APPS4aME	Américo Azevedo	RES	PROG - EU	FP7		EU	PAR	2012-12	FIN
FOCUS	Alexandra Sofia Marques	RES	PROG - EU	FP7		EU	PROP	2014-01	CONT
EXPLORE	José Carlos Caldeira	TT	PROG - EU	FP7		EU	PROP	2013-09	FIN
EU-GREAT	Luís Carneiro	RES	PROG - EU	H2020		EU	PAR	2015-01	START
WMF2015	Luís Carneiro	CONF	PROG - EU	H2020		EU	PAR	2015-02	START
BEinCPPS	César Toscano	RES	PROG - EU	H2020		EU	PAR	2015-10	START
IzaroGrey	António Correia Alves	DES	SERV - UE				CONT	2007-01	CONT
ParqueEscolar	Luís Guardão	DES	SERV - NAT				CONT	2009-11	CONT
Creative_Retail	Rui Diogo Rebelo	RES	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2013-06	CONT
ProdExport	António Correia Alves	CONS	SERV - NAT	POFC / POR	VALE INOV		SUB	2013-07	CONT
FLUPLAN	Pedro Ribeiro	CONS	SERV - NAT	POFC / POR	VALE INOV		SUB	2013-11	FIN
COOL	Jorge Pinho de Sousa	DES	SERV - NAT				CONT	2013-12	CONT
RCE	Luís Carneiro	DES	SERV - NAT	POFC / POR			SUB	2014-01	CONT
Cap@CIDADE	António Lucas Soares	CONS	SERV - NAT				CONT	2014-08	CONT
PFF_SIM	Rui Diogo Rebelo	CONS	SERV - NAT				CONT	2014-08	CONT
N&N-ESPP	António Correia Alves	CONS	SERV - NAT				CONT	2014-08	CONT
MSAC	António Correia Alves	CONS	SERV - NAT				CONT	2014-07	CONT

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
FLOW-SIM-LT	Samuel Moniz	RES	SERV - EU				CONT	2014-11	CONT
SPI	António Correia Alves	CONS	SERV - NAT				CONT	2014-06	CONT
Opti-calçado	Rui Diogo Rebelo	CONS	SERV - NAT				CONT	2015-01	START
GlassWind	António Correia Alves	DES	SERV - NAT				CONT	2014-12	CONT
SMARTVALV	Pedro Ribeiro	DES	SERV - NAT				CONT	2014-11	CONT
BI4UPX	Luís Guardão	DES	SERV - NAT				CONT	2014-12	CONT
CASMOV2	Luís Guardão	DES	SERV - NAT				CONT	2014-12	CONT
BM2PIS	António Correia Alves	CONS	SERV - NAT				CONT	2014-12	CONT
PRODUTECH_Plann	António Correia Alves	CONS	SERV - NAT				CONT	2015-06	START
SGM	António Correia Alves	CONS	SERV - NAT				CONT	2015-02	START
SmartSL	Rui Diogo Rebelo	CONS	SERV - NAT				CONT	2015-07	START
Consultoria	Luís Carneiro	CONS	SERV - NAT				CONT	2009-01	CONT

Dominant Activity Type:

RES – Research
DEV – Development
CONS - Consulting
TT - Technology Transfer
NET - Network
CONF - Conference
TRAIN - Advanced Training
INC - Incubation
O - Other

Source:

PROG – NAT – National Programmes
PROG – EU – European Union Programmes
SERV - NAT - Supply of Services - National
SERV - EU - Supply of Services - European Union
SERV - INT - Supply of Services - International
ORD - Other R&D Services
O - Other External Services
INT - Internal

Type:

IND – Individual Project
NAT - National Cooperation
EU - European Union Cooperation (EU+Associated Countries)
INT - Internal Cooperation

Role INESCP:

PROP - Proponent
PAR - Partner
CONT - Prime Contractor
SUB - Subcontractor
MEMB - Member
O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Mendes Moreira,J, Jorge,AM, de Sousa,JF, Soares,C, "Improving the accuracy of long-term travel time prediction using heterogeneous ensembles", NEUROCOMPUTING, vol.150, no.PB, pp.428-439, FEB 20, 2015
2. Da Costa,JP, Roque,LAC, Soares,C, "The weighted rank correlation coefficient in the case of ties", STATISTICS & PROBABILITY LETTERS, vol.99, pp.20-26, APR, 2015
3. Rodrigues,AM, Ferreira,JS, "Waste Collection Routing-Limited Multiple Landfills and Heterogeneous Fleet", NETWORKS, vol.65, no.2, pp.155-165, MAR, 2015
4. Ramos,P, Santos,N, Rebelo,R, "Performance of state space and ARIMA models for consumer retail sales forecasting", ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING, vol.34, pp.151-163, AUG, 2015

5. Del Monego,M, Ribeiro,PJ, Ramos,P, "Comparing the performance of geostatistical models with additional information from covariates for sewage plume characterization", ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, vol.22, no.8, pp.5850-5863, APR, 2015
6. Donauer,M, Pecas,P, Azevedo,AL, "Nonconformity tracking and prioritisation matrix: an approach for selecting nonconformities as a contribution to the field of TQM", PRODUCTION PLANNING & CONTROL, vol.26, no.2, pp.131-149, JAN 25, 2015
7. Dinis Carvalho,J, Moreira,F, Braganca,S, Costa,E, Alves,A, Sousa,R, "Waste identification diagrams", PRODUCTION PLANNING & CONTROL, vol.26, no.3, pp.235-247, FEB 17, 2015
8. Parragh,SN, de Sousa,JP, Almada Lobo,B, "The Dial-a-Ride Problem with Split Requests and Profits", TRANSPORTATION SCIENCE, vol.49, no.2, pp.311-334, MAY, 2015
9. Donauer,M, Pecas,P, Azevedo,A, "Identifying nonconformity root causes using applied knowledge discovery", ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING, vol.36, pp.84-92, DEC, 2015
10. Brito,PQ, Soares,C, Almeida,S, Monte,A, Byvoet,M, "Customer segmentation in a large database of an online customized fashion business", ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING, vol.36, pp.93-100, DEC, 2015
11. Braganca,S, Costa,E, "An application of the lean production tool standard work", Jurnal Teknologi, vol.76, no.1, pp.47-53, 2015
12. Pinto,F, Soares,C, Brazdil,P, "Combining regression models and metaheuristics to optimize space allocation in the retail industry", INTELLIGENT DATA ANALYSIS, vol.19, no.s1, pp.S149-S162, 2015-11-03, 2015
13. Azevedo,A, Almeida,A, "Editorial", Robotics and Computer-Integrated Manufacturing, vol.36, pp.1, 2015-12, 2015
14. Pinto Da Costa,J, Roque,LA, Soares,C, "The weighted rank correlation coefficient r_{W2} in the case of ties", Statistics & Probability Letters, vol.99, pp.20-26, 2015-4, 2015

G.2. International Conference Proceedings with scientific referees

1. Ferreira,F, Shamsuzzoha,A, Azevedo,A, Helo,P, "Virtual Enterprise Process Monitoring: An Approach towards Predictive Industrial Maintenance", PROGRESS IN SYSTEMS ENGINEERING, vol.366, pp.285-291, 2014-8-6, 2015
2. Faria,JA, Novoa,H, "An Agile BPM System for Knowledge-Based Service Organizations", EXPLORING SERVICES SCIENCE, IESS 2015, vol.201, pp.65-79, 2015, 2015
3. Vilaca,A, Aguiar,A, Soares,C, "Estimating Fuel Consumption from GPS Data", PATTERN RECOGNITION AND IMAGE ANALYSIS (IBPRIA 2015), vol.9117, pp.672-682, 2015-06-09, 2015
4. Pinto,F, Soares,C, Mendes Moreira,J, "Pruning bagging ensembles with metalearning", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9132, pp.64-75, 2015-06-03, 2015
5. Moniz,S, Barbosa Pova,AP, de Sousa,JP, "On the complexity of production planning and scheduling in the pharmaceutical industry: the Delivery Trade-offs Matrix", 12TH INTERNATIONAL SYMPOSIUM ON PROCESS SYSTEMS ENGINEERING AND 25TH EUROPEAN SYMPOSIUM ON COMPUTER AIDED PROCESS ENGINEERING, PT C, vol.37, pp.1865-1870, 2015, 2015
6. Félix,C, Soares,C, Jorge,A, "Metalearning for multiple-domain transfer learning", CEUR Workshop Proceedings, vol.1455, pp.67-79, 2015-10-06, 2015
7. Mendes,J, Fernandes,P, Pereira,CS, "An Information System for the Cutting Stock Problem with Optimization of Retail Materials in Stock", PROCEEDINGS OF THE 2015 10TH IBERIAN CONFERENCE ON INFORMATION SYSTEMS AND TECHNOLOGIES (CISTI 2015), 2015
8. de Sa,CR, Rebelo,C, Soares,C, Knobbe,A, "Distance-Based Decision Tree Algorithms for Label Ranking", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.525-534, 2015-08-26, 2015

9. Zarmehri,MN, Soares,C, "Using metalearning for prediction of taxi trip duration using different granularity levels", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9385, pp.205-216, 2015-10-13, 2015
10. Zarmehri,MN, Soares,C, "Metalearning to Choose the Level of Analysis in Nested Data: A Case Study on Error Detection in Foreign Trade Statistics", 2015 INTERNATIONAL JOINT CONFERENCE ON NEURAL NETWORKS (IJCNN), vol.2015-September, pp.1-8, 2015-7, 2015
11. Costa,E, Soares,AL, de Sousa,JP, "A New Insight in the SMEs Internationalization Process", RISKS AND RESILIENCE OF COLLABORATIVE NETWORKS, vol.463, pp.398-410, 2015, 2015
12. Sadic,S, de Sousa,JP, Crispim,JA, "Flexibility in the Formation and Operational Planning of Dynamic Manufacturing Networks", RISKS AND RESILIENCE OF COLLABORATIVE NETWORKS, vol.463, pp.604-611, 2015, 2015
13. Bastos,J, Azevedo,A, Avila,P, "Towards a Customer-Driven Value Chain Framework - A Set-Based Oriented Approach", RISKS AND RESILIENCE OF COLLABORATIVE NETWORKS, vol.463, pp.209-222, 2015, 2015
14. Sousa,C, Soares,A, "A Conceptual Relations Reference Model to the Construction and Assessment of Lightweight Ontologies", ON THE MOVE TO MEANINGFUL INTERNET SYSTEMS: OTM 2015 WORKSHOPS, vol.9416, pp.502-511, 2015
15. Saleiro,P, Amir,S, Silva,M, Soares,C, "POPmine: Tracking political opinion on the web", Proceedings - 15th IEEE International Conference on Computer and Information Technology, CIT 2015, 14th IEEE International Conference on Ubiquitous Computing and Communications, IUCC 2015, 13th IEEE International Conference on Dependable, Autonomic and Se, pp.1521-1526, 2015
16. Santos,C, Araujo,M, Correia,N, "Towards a Classification of Technology Strategy Frameworks", PROCEEDINGS OF 9TH EUROPEAN CONFERENCE ON IS MANAGEMENT AND EVALUATION (ECIME 2015), pp.180-187, 2015

G.3. Books (Author)

(Void)

G.4. Chapter/Paper in Books

1. Moniz,S, Barbosa Póvoa,AP, De Sousa,JP, "Recent trends and challenges in planning and scheduling of chemical-pharmaceutical plants", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.123-130, 2015, 2015
2. Rodrigues,AM, Ferreira,JS, "Measures in sectorization problems", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.203-211, 2015
3. Rocha,P, Rodrigues,R, Miguel Gomes,A, Alves,C, "GPU-based computing for nesting problems: The importance of sequences in static selection approaches", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.195-202, 2015
4. Rodrigues,AM, Ferreira,JS, "Sectors and Routes in Solid Waste Collection", Operational Research - CIM Series in Mathematical Sciences, pp.353-375, 2015, 2015

G.5. Publications (Editor)

1. Appice,A, Rodrigues,PP, Costa,VS, Soares,C, Gama,J, Jorge,A, "Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2015, Porto, Portugal, September 7-11, 2015, Proceedings, Part I", ECML/PKDD (1), vol.9284, 2015, 2015
2. Appice,A, Rodrigues,PP, Costa,VS, Gama,J, Jorge,A, Soares,C, "Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2015, Porto, Portugal, September 7-11, 2015, Proceedings, Part II", ECML/PKDD (2), vol.9285, 2015, 2015

G.6. Other Publications

1. Matopoulos,A, Barros,AC, van der Vorst,JGAJ, "Resource-efficient supply chains: a research framework, literature review and research agenda", SUPPLY CHAIN MANAGEMENT-AN INTERNATIONAL JOURNAL, vol.20, no.2, pp.218-236, 2015-3-9, 2015
2. Azevedo,A, Almeida,A, "Editorial", Robotics and Computer-Integrated Manufacturing, vol.36, pp.1, 2015
3. Azevedo,A, Almeida,A, "SPECIAL ISSUE: Sustaining Resilience in Today's Demanding Environments", ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING, vol.36, pp.1-1, DEC, 2015

POWER AND ENERGY SYSTEMS

A. DESCRIPTION OF THE RESEARCH CENTRE

The operational and strategic issues regarding the centre are addressed within the Coordination Council, constituted by the group Coordinator, the Coordination Assistant (full contract) and the Area Leaders. This follows the general organization structure within INESC TEC. Support is provided by a secretary and an assistant for monitoring and reporting. A monthly meeting of all the PhD holders (CPES Council) completes the structure.

The Centre for Power and Energy Systems is organized in five application areas, described below:

Network Studies and RES & DER integration

Steady-state, dynamic and transient stability (isolated and interconnected power systems). Renewables' integration, Grid codes, Ancillary services from RES. New technologies for flexible transmission and distribution grids, Reduced scale laboratorial testing for power converters (power-hardware-in-the-loop)

DMS/EMS and System Operation

Specification, development and integration of advanced computational tools for network management systems, such as: Topology processors, Load allocation, Fuzzy state estimation, Voltage and reactive power control, Fault location with fuzzy inference, Isolation and Restoration (FDIR), Optimal network reconfiguration, Optimal power flow, Contingency analysis, Dispatch Training System, Distribution State Estimator including unbalanced networks

System Planning and Reliability

Load research, loss reduction, load pattern analysis, classification and management.

Transmission and distribution system planning. Security of supply, reserves adequacy, transmission and distribution reliability.

Electricity Markets and Regulation

Cost allocation for electricity grid users including short and long-term marginal cost methods and estimating marginal compensation. Methodologies for generation expansion in a market environment. New markets and services and new tariff schemes.

Energy Analytics and Forecasting

Forecasting of load, RES and market variables, Demand response. Power system and end-users data analytics. HEMS (Home Energy Management Systems) integration. Inclusion of uncertainty in decision-making and optimization problems

B. MAIN ACHIEVEMENTS

Within the Smart Grid paradigm, the Centre for Power and Energy Systems consolidated the research achievements with different activities, from fundamental research to prototyping and technology transfer. The activity of the Smart Grid and Electric Vehicle Laboratory supported external demonstrations like the one in the Évora demonstration site, in the framework of FP7 project Sustainable.

The main achievements in 2015 were:

- Identification and development of management and control solutions for large scale EV and microgeneration deployment with a strong presence of active demand response
- Development of new advanced management functionalities for distribution grids with large-scale deployment of DER
- Demonstration of advanced control tools in the real smart grids pilot in Évora, namely a voltage control algorithm for LV grids in Graça do Divor, a state estimation algorithm for estimating MV quantities based on smart meter readings at the Montemor Substation and a PV forecasting algorithm for individual LV clients and aggregated also at the MV level for the Évora region.
- Assessment of sympathetic tripping occurrence in distribution grids with different DG technologies connected to it
- Development of protective relay function for allowing DG on providing fault ride-through capability
- Risk analysis performed to stationary Li-ion batteries.
- Participation on the development of an online dashboard tool for cities, in the SusCity project
- Definition of the overall methodology for integration and validation of the iTesla platform involving the integration of several software modules while supporting the TSOs in the validation of the use different use-cases, in the framework of the EU FP7 project iTesla.
- Development of the Fuzzy Power Flow module for the iTesla platform that enables contingency filtering taking into account fuzzy active and reactive power injections.
- Experimental validation of MG service restoration procedures and coordinated control strategies exploiting the role of EV, storage devices, microgeneration units and responsive loads, in order to ensure a seamless transition to islanding operation while increasing its resilience.
- Identification of innovative procedures for power system restoration following a general blackout in electric power systems with by a large share of renewable-based energy sources connected the transmission and distribution levels
- Validation of dynamic simulation models for variable speed pumped storage units, operating either in turbine or pump mode, together with the specification of control functionalities for the provision of specific grid services
- Application for estimating the amounts of mandatory (regulatory) investments in the distribution network, for each voltage level and region. Integration of new features (sensitivity analysis, extension of the outcomes to the municipalities' areas and incorporation of the most recent DSO network expansion guidelines)
- Development and implementation of a decision-aid tool for selecting the best network reinforcement strategies, through the analysis of the long term impact (30 years) of the investment deferral allowed by smart grids.
- Tool for assessing the impact of investments on the quality of service, network losses and operational efficiency of the distribution network. Results were integrated in the Distribution Network Development and Investments Plan (a regulation instrument required by the Portuguese regulatory authority)
- The loss profiles computed by CPES for EDP Distribuição were adopted by the Portuguese regulatory authority to be used in the electricity market in the years of 2015 and 2016.
- Integration and validation in DSO networks of the new algorithm for state estimation on networks with insufficient information, using an autoencoder trained using historical data
- Development of a new upscaling algorithm for wind power forecasting aiming to estimate the total wind power generation in Portugal, using a subset of wind farms. This new algorithm was transferred to a company (Prewind), which is now providing the service to EDP.

- Development and technology transfer of a probabilistic forecasting methodology that produces upscaled forecasts for solar, small-hydro, CHP and wind power, using information from a poor man's ensemble prediction system
- Development of a renewable energy probabilistic forecasting methodology that combines quantile regression in the Reproducing Kernel Hilbert Space (RKHS) with online gradient based learning
- Development of a robust optimal power flow (OPF) algorithm that integrates information about spatial-temporal trajectories (i.e., renewable energy uncertainty)
- Formulation of an optimization problem for variable speed pump storage power (PSP) participating in the frequency restoration reserve market. Detailed modelling of PSP units for optimization problems.
- Development of new market models adapted to generation systems with a large share of hydro systems, as for instance the Brazilian generation system;
- Development of models regarding the implementation of new tariffs, namely Dynamic Tariffs, as a way to induce more efficient uses of the networks.
- Development of new algorithms to deal with the combinatorial nature of transmission expansion planning problems, namely to reduce the search space;

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	77	173	339	318	166	-48%
European Union Programmes	357	278	434	706	1.254	78%
R&D Services and Consulting	1.104	651	447	499	677	36%
Other R&D sources	397	437	40			
Other external sources	54	97		15	23	53%
Total	1.989	1.636	1.260	1.538	2.120	38%

Number of Projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	2	5%	66	3%
	National Programmes - QREN				
	National Programmes – P2020				
	National Programmes - PICT	2	5%	100	5%
	European Union Programmes – FP7	6	14%	752	35%
	European Union Programmes – H2020	4	9%	502	24%
	European Union Programmes - Other				
	R&D Services and Consulting - National	23	52%	609	29%
	R&D Services and Consulting – European Union	1	2%		
	R&D Services and Consulting - International	3	7%	68	3%
	Other R&D sources				
	Other external sources	2	5%	23	1%
	Internal	1	2%		
Dominant Activity type	Basic Research	14	32%	1.420	67%
	Applied Research and Development	6	14%	290	14%
	Consulting	21	48%	387	18%
	Technology Transfer				
	Network				
	Conference	1	2%	23	1%
	Advanced Training	1	2%		
	Incubation				
	Other	1	2%		
Execution Status	Started	14	32%	537	25%
	Continuation	13	30%	848	40%
	Started and Concluded within the year	3	7%	51	2%
	Concluded	14	32%	684	32%
Total		44		2.120	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	17	12	33	18	20	15
International Conference Proceedings with scientific referees	38	80	45	49	56	28
Books - Author			4	1	1	
Chapter in books		1	3	9	4	
Publications (Editor)			1			
Other Publications	2		1	1		1
Total	57	93	87	78	81	44

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	45
Doctoral	4
Total	49

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
Comute-DC	Carlos Moreira	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2013-07	FIN
SusCity	Manuel Matos	RES	PROG - NAT	FCT	PROJ MIT	INT	PROP	2015-01	START
SmartGrids	João Peças Lopes	RES	PROG - NAT	POR Norte		NAT	PROP	2013-01	FIN
iTESLA	André Madureira	RES	PROG - EU	FP7		EU	PAR	2012-01	CONT
STABALID	Filipe Joel Soares	RES	PROG - EU	FP7		EU	PAR	2012-10	FIN
SuSAINABLE	Luís Seca	RES	PROG - EU	FP7		EU	PAR	2013-01	CONT
evolvDSO	Manuel Matos	RES	PROG - EU	FP7		EU	PAR	2013-09	CONT
Hyperbole	Carlos Moreira	RES	PROG - EU	FP7		EU	PROP	2013-09	CONT
EleCtra	José Nuno Fidalgo	RES	PROG - EU	FP7		EU	PAR	2013-12	CONT
SENSIBLE	Ricardo Bessa	RES	PROG - EU	H2020		EU	PAR	2015-02	START
UPGRID	Luís Seca	RES	PROG - EU	H2020		EU	PAR	2015-02	START
AnyPLACE	David Rua	RES	PROG - EU	H2020		EU	PROP	2015-02	START
SmarterEMC2	David Rua	RES	PROG - EU	H2020		EU	PAR	2015-02	START
EFACEC-DMS	Jorge Correia Pereira	DES	SERV - NAT				CONT	2001-04	CONT
Enercon-WindStudies	Carlos Moreira	CONS	SERV - NAT				CONT	2007-11	FIN
EFACEC-OPF	Jorge Correia Pereira	DES	SERV - NAT				CONT	2006-10	FIN
PROB	José Nuno Fidalgo	CONS	SERV - NAT				CONT	2012-04	CONT
SCADA-BT	Jorge Correia Pereira	DES	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2012-09	FIN
Prev_Agreg	Ricardo Bessa	CONS	SERV - NAT				CONT	2013-03	FIN
Madeirarenov_2014	Luís Seca	CONS	SERV - NAT				CONT	2014-01	CONT
OTGEN	João Tomé Saraiva	CONS	SERV - NAT				CONT	2014-03	CONT
3Phase	Jorge Correia Pereira	CONS	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
Ruanda_Solar	Luís Seca	CONS	SERV - NAT				CONT	2014-05	FIN
Prev_PRE	Luís Seca	CONS	SERV - NAT				CONT	2014-06	FIN
Perfis_Perdas_2015	José Nuno Fidalgo	CONS	SERV - NAT				CONT	2014-05	FIN
PrevSol	Ricardo Bessa	CONS	SERV - NAT				CONT	2014-01	FIN
SiMicrogrids	Carlos Moreira	CONS	SERV - NAT				CONT	2015-01	START-FIN
CP_T_Dinamicas	João Tomé Saraiva	CONS	SERV - NAT				CONT	2015-02	START
CVE	Bernardo Amaral Silva	CONS	SERV - NAT				CONT	2015-06	START-FIN
ReservaProb	Ricardo Bessa	CONS	SERV - NAT				CONT	2015-10	START
Tarif_Dinam_Acores	João Saraiva	CONS	SERV - NAT				CONT	2015-12	START

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
Estim_Invest_Dist	José Nuno Fidalgo	CONS	SERV - NAT				CONT	2015-09	START
Segur_Abast_Madeira	João Saraiva	CONS	SERV - NAT				CONT	2015-10	START
Terceira_Renov	Bernardo Amaral Silva	CONS	SERV - NAT				CONT	2015-09	START
Meteo_NMP_Forecast	Ricardo Bessa	CONS	SERV - UE				CONT	2015-12	START
BIOGAS	João Peças Lopes	CONS	SERV - NAT				CONT	2015-11	START
Consultoria	Manuel Matos	CONS	SERV - NAT				CONT	2008-01	CONT
Parafuzzy	Jorge Correia Pereira	DES	SERV - INT				CONT	2008-09	FIN
SIMULESP	Jorge Correia Pereira	DES	SERV - INT				CONT	2011-01	FIN
SECRETS	Luís Seca	DES	SERV - INT				CONT	2013-12	CONT
CoordEES-UETP	João Peças Lopes	TRAIN	O			INT	PROP	2007-04	CONT
ISAP2015	Vladimiro Miranda	CONF	O			INT	PROP	2015-06	START-FIN
SGEVL	Carlos Moreira	O	INT				PROP	2014-01	CONT

Dominant Activity Type:

RES – Research
 DEV – Development
 CONS - Consulting
 TT - Technology Transfer
 NET - Network
 CONF - Conference
 TRAIN - Advanced Training
 INC - Incubation
 O - Other

Source:

PROG – NAT – National Programmes
 PROG – EU – European Union Programmes
 SERV - NAT - Supply of Services - National
 SERV - EU - Supply of Services - European Union
 SERV - INT - Supply of Services - International
 ORD - Other R&D Services
 O - Other External Services
 INT - Internal

Type:

IND – Individual Project
 NAT - National Cooperation
 EU - European Union Cooperation
 (EU+Associated Countries)
 INT - Internal Cooperation

Role INESCP:

PROP - Proponent
 PAR - Partner
 CONT - Prime Contractor
 SUB - Subcontractor
 MEMB - Member
 O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Carvalho,M, Pedroso,JP, Saraiva,J, "ELECTRICITY DAY-AHEAD MARKETS: COMPUTATION OF NASH EQUILIBRIA", JOURNAL OF INDUSTRIAL AND MANAGEMENT OPTIMIZATION, vol.11, no.3, pp.985-998, JUL, 2015
2. Moura,AP, Lopes,JAP, de Moura,AAF, Sumaili,J, Moreira,CL, "IMICV fault analysis method with multiple PV grid-connected inverters for distribution systems", ELECTRIC POWER SYSTEMS RESEARCH, vol.119, pp.119-125, FEB, 2015
3. Gouveia,C, Rua,D, Soares,FJ, Moreira,C, Matos,PG, Peças Lopes,JAP, "Development and implementation of Portuguese smart distribution system", ELECTRIC POWER SYSTEMS RESEARCH, vol.120, pp.150-162, MAR, 2015
4. Lima,SL, Saavedra,OR, Miranda,V, "A Two-Level Framework to Fault Diagnosis and Decision Making for Power Transformers", IEEE TRANSACTIONS ON POWER DELIVERY, vol.30, no.1, pp.497-504, FEB, 2015
5. Kamel,S, Jurado,F, Peças Lopes,JAP, "Comparison of various UPFC models for power flow control", ELECTRIC POWER SYSTEMS RESEARCH, vol.121, pp.243-251, APR, 2015

6. Moura,AP, Pegas Lopes,JAP, de Moura,AAF, "Sequence networks to the calculation of two-simultaneous faults at the same location", INTERNATIONAL JOURNAL OF ELECTRICAL POWER & ENERGY SYSTEMS, vol.69, pp.414-420, JUL, 2015
7. Heleno,M, Matos,MA, Lopes,JAP, "Availability and Flexibility of Loads for the Provision of Reserve", IEEE TRANSACTIONS ON SMART GRID, vol.6, no.2, pp.667-674, MAR, 2015
8. Pereira Barbeiro,PNP, Teixeira,H, Krstulovic,J, Pereira,J, Soares,FJ, "Exploiting autoencoders for three-phase state estimation in unbalanced distributions grids", ELECTRIC POWER SYSTEMS RESEARCH, vol.123, pp.108-118, JUN, 2015
9. Bessa,RJ, Trindade,A, Miranda,V, "Spatial-Temporal Solar Power Forecasting for Smart Grids", IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS, vol.11, no.1, pp.232-241, FEB, 2015
10. Soares,FJ, Carvalho,L, Costa,IC, Iria,JP, Bodet,JM, Jacinto,G, Lecocq,A, Roessner,J, Caillard,B, Salvi,O, "The STABALID project: Risk analysis of stationary Li-ion batteries for power system applications", RELIABILITY ENGINEERING & SYSTEM SAFETY, vol.140, pp.142-175, AUG, 2015
11. Bessa,RJ, Trindade,A, Silva,CSP, Miranda,V, "Probabilistic solar power forecasting in smart grids using distributed information", INTERNATIONAL JOURNAL OF ELECTRICAL POWER & ENERGY SYSTEMS, vol.72, pp.16-23, NOV, 2015
12. Rocha Almeida,PMR, Soares,FJ, Pegas Lopes,JAP, "Electric vehicles contribution for frequency control with inertial emulation", ELECTRIC POWER SYSTEMS RESEARCH, vol.127, pp.141-150, OCT, 2015
13. Pereira Barbeiro,PNP, Moreira,C, Keko,H, Teixeira,H, Rosado,N, Moreira,J, Rodrigues,R, "Sizing and siting static synchronous compensator devices in the Portuguese transmission system for improving system security", IET GENERATION TRANSMISSION & DISTRIBUTION, vol.9, no.10, pp.957-965, JUL, 2015
14. Strbac,G, Hatzigiorgiou,N, Lopes,JP, Moreira,C, Dimeas,A, Papadaskalopoulos,D, "Microgrids: Enhancing the Resilience of the European Megagrid", IEEE Power and Energy Magazine - IEEE Power and Energy Mag., vol.13, no.3, pp.35-43, 2015-5, 2015
15. Moutinho,J, Araújo,R, Freitas,D, "Indoor localization with audible sound ? Towards practical implementation", Pervasive and Mobile Computing, 2015-10, 2015

G.2. International Conference Proceedings with scientific referees

1. Marcelino,CG, Carvalho,LM, Almeida,PEM, Wanner,EF, Miranda,V, "Application of Evolutionary Multiobjective Algorithms for Solving the Problem of Energy Dispatch in Hydroelectric Power Plants", EVOLUTIONARY MULTI-CRITERION OPTIMIZATION, PT II, vol.9019, pp.403-417, 2015-03-18, 2015
2. Barreras,JV, Pinto,C, De Castro,R, Schaltz,E, Andreasen,SJ, Rasmussen,PO, Araújo,RE, "A novel BEV concept based on fixed and swappable li-ion battery packs", 2015 10th International Conference on Ecological Vehicles and Renewable Energies, EVER 2015, 2015-3, 2015
3. Fernandes,R, Campos,P, Rita Gaio,AR, "An Agent-Based MicMac Model for Forecasting of the Portuguese Population", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.702-707, 2015, 2015
4. Heleno,M, Soares,R, Sumaili,J, Bessa,RJ, Seca,L, Matos,MA, "Estimation of the flexibility range in the transmission-distribution boundary", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
5. Iria,JP, Soares,FJ, Bessa,RJ, "Optimized Demand Response Bidding in the Wholesale Market under Scenarios of Prices and Temperatures", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
6. Souza,SSF, Romero,R, Pereira,J, Saraiva,JT, "Specialized genetic algorithm of Chu-Beasley applied to the Distribution System Reconfiguration problem considering several demand scenarios", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
7. Heymann,F, Bessa,R, "Power-to-Gas potential assessment of Portugal under special consideration of LCOE", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015

8. Heleno,M, Rua,D, Gouveia,C, Madureira,A, Matos,MA, Lopes,JP, Silva,N, Salustio,S, "Optimizing PV self-consumption through electric water heater modeling and scheduling", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
9. Calabria,FA, Saraiva,JT, Rocha,AP, "A new electricity market design for power systems with large share of hydro: Improving flexibility and ensuring efficiency and security in the Brazilian case", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015
10. Barbeiro,PNP, Teixeira,H, Pereira,J, Bessa,R, "An ELM-AE State Estimator for real-time monitoring in poorly characterized distribution networks", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
11. Brandao,RFM, Carvalho,JAB, Barbosa,FPM, "Intelligent system for fault detection in wind turbines gearbox", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
12. Gomes,PV, Saraiva,JT, "Static transmission expansion planning using Heuristic and metaheuristic techniques", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
13. Pinto,R, Carvalho,LM, Sumaili,J, Pinto,MSS, Miranda,V, "Coping with wind power uncertainty in Unit Commitment: A robust approach using the new hybrid metaheuristic DEEPSO", 2015 IEEE Eindhoven PowerTech, PowerTech 2015, 2015-6, 2015
14. Calabria,FA, Saraiva,JT, Rocha,AP, "A virtual reservoir electricity market design applied to the Brazilian system using an Agent Based Model", International Conference on the European Energy Market, EEM, vol.2015-August, 2015
15. Metz,D, Saraiva,JT, "Evaluation of the impact of storage systems on grid electricity demand in the German context", International Conference on the European Energy Market, EEM, vol.2015-August, 2015
16. Soares,RA, Saraiva,JT, Fidalgo,JN, Martins,BC, "Forecast of the bidding curve of generation players in the Iberian electricity market", International Conference on the European Energy Market, EEM, vol.2015-August, 2015
17. Soares,RA, Saraiva,JT, "Economic evaluation of generation and storage solutions in low voltage end user installations", International Conference on the European Energy Market, EEM, vol.2015-August, 2015
18. Pereira,J, Alves,J, Matos,M, "Optimization of electrical distribution network operation based on EPSO", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015-9, 2015
19. Frutuoso De Souza,SS, Romero,R, Pereira,JMC, Saraiva,JPT, "Distribution System Reconfiguration with variable demands using the Clonal selection Algorithm", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015-9, 2015
20. Monteiro Pereira,RM, Machado Ferreira,CM, Maciel Barbosa,FP, "Reactive power management of a wind farm to prevent voltage collapse of an electric power system", Proceedings of the Universities Power Engineering Conference, vol.2015-November, 2015-9, 2015
21. Valdez,MT, Ferreira,CM, Martins,MJM, Barbosa,FPM, "3D virtual reality experiments to promote electrical engineering education", 2015 International Conference on Information Technology Based Higher Education and Training, ITHET 2015, 2015-6, 2015
22. Moutinho,J, Freitas,D, Araújo,RE, "Spread spectrum audio indoor localization", Proceedings - IEEE 18th International Conference on Computational Science and Engineering, CSE 2015, pp.66-71, 2015-10, 2015
23. Carvalho,LM, Loureiro,F, Sumaili,J, Keko,H, Miranda,V, Marcelino,CG, Wanner,EF, "Statistical tuning of DEEPSO soft constraints in the Security Constrained Optimal Power Flow problem", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015-9, 2015

24. Lima,FPA, Minussi,CR, Bessa,RB, Fidalgo,JN, "A modified negative selection algorithm applied in the diagnosis of voltage disturbances in distribution electrical systems", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015-9, 2015
25. Filipe,JM, Bessa,RJ, Sumaili,J, Tomé,R, Sousa,JN, "A hybrid short-term solar power forecasting tool", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015-9, 2015
26. Keko,H, Miranda,V, "Impact of clustering-based scenario reduction on the perception of risk in unit commitment problem", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015
27. Krstulovi?,J, Miranda,V, "Denoising auto-associative measurement screening and repairing", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015
28. Bessa,RJ, "From marginal to simultaneous prediction intervals of wind power", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015

G.3. Books (Author)

(Void)

G.4. Chapter/Paper in Books

(Void)

G.5. Publications (Editor)

(Void)

G.6. Other Publications

1. Vasconcelos,H, Moreira,C, Madureira,A, Lopes,JP, Miranda,V, "Advanced Control Solutions for Operating Isolated Power Systems: Examining the Portuguese islands", IEEE Electrification Magazine, vol.3, no.1, pp.25-35, 2015-3, 2015

INFORMATION SYSTEMS AND COMPUTER GRAPHICS

A. DESCRIPTION OF THE RESEARCH CENTRE

CSIG follows the general model adopted in INESC TEC: it is led by a Coordination board, which is assisted by an advisory RG Council, and is organized in 5 Research Areas.

CSIG is composed by professors, students, and staff. Professors and students come from four different institutions, the Faculty of Engineering of the University of Porto, the University of Trás-os-Montes e Alto Douro, Open University/Universidade Aberta and the Polytechnic of Porto. The RG is organized in five areas: Computer Graphics and Virtual Environments, Special Purpose Computing Systems, Accessibility, Information Management and Systems, and Software Engineering.

CSIG is led by a two-member Coordination, sharing the responsibility of managing the RG. Gabriel David is more in charge of the scientific coordination and António Gaspar is more in charge of the contractual activity and administrative issues. Gabriel David was named for the board of Directors and was replaced in November 2015 by Angelo Martins

Each of the five research areas has a coordinator: Augusto Sousa for the Computer Graphics and Virtual Environments area, João Paiva Cardoso for the Special Purpose Computing Systems area, João Barroso for the Accessibility area, Cristina Ribeiro for the Information Management and Systems area, and Pascoal Faria for the Software Engineering area.

CSIG main research goals are organized as follows:

INNOVATIVE METHODS IN COMPUTER GRAPHICS AND VIRTUAL ENVIRONMENTS - Research innovative methods in computer graphics and multimodal, multi-sensorial virtual environments, as well as in natural user interfaces, especially with applications in serious games, including immersive and interactive urban planning, based on virtual environments. Special focus has been given to mobile devices, to modeling and visualization of large scenes for immersive environments, and to image synthesis.

INFORMATION MANAGEMENT, RETRIEVAL AND PROCESSING - Investigate frameworks for information management, retrieval and processing in contexts such as web mining, recommender systems, social web, semantic web, information retrieval and text mining. This leads to the development of innovative systems such as federated libraries of semantically socially assisted annotated documents, digital cultural heritage portfolios and e-learning environments and tools.

DIGITAL PRESERVATION - Devise models, methods and tools for digital preservation particularly in the area of database preservation and scientific data repository management. Preliminary work has already taken place on the transformation of databases into preservation-friendly representations under the framework established by the OAIS, and on the development of tools for descriptions of scientific datasets.

SOFTWARE DEVELOPMENT METHODOLOGIES - Improve and innovate on current software development methodologies with particular emphasis on model-driven development with formal methods, agile and collaborative development methodologies, and software quality assurance based on software testing, verification and certification.

LANGUAGES FOR RECONFIGURABLE COMPUTING ARCHITECTURES - Develop compilation techniques to map computations to reconfigurable computing architectures, design of domain-specific languages (DSLs) and development of tools to assist all stages of a design cycle to implement energy efficient, high-performance embedded computing systems.

LARGE SCALE INFORMATION SYSTEMS - Develop methodologies and architectures for large-scale information systems, focusing on system integration and interoperability. The activity is also driven by applications with

particular emphasis in the areas of public administration (e-Government), healthcare (e-Health), telecommunications, transport and industry.

B. MAIN ACHIEVEMENTS

The group maintains its research production, despite the difficult conditions caused by research budget cuts that reduced the number of projects and PhD students.

In 2015 and in comparison with the previous year, the budget increased 49%, slightly surpassing 1,4 M€. All lines of activity increased: services increased 9%, national programmes increased 130% and European projects increased 58%. The Centre maintained its three EU FP7 projects (ICARUS, E-COMPARED and LeanBigData) and gained two more EEA projects (STOPDEPRESSION and SEABIODATA). Most services contracts were also maintained and were reinforced by three new ones (RTE, DIGITAVE and DRIW2020). National projects were joined by CE4Blind.

Prototypes were produced in MASSIVE, ICARUS, E-COMPARED, LeanBigData, SARA, RAIA.TEC, EYEFYRY, INMERSE. Pilot installations were deployed in AAL4ALL, OASRN, 3PORT, PGLOBAL, WIDERMOS, DIGITAVE. MASSIVE also has created a Virtual Reality Laboratory which is based in Vila Real at INESC TEC's UTAD pole.

The group continued its involvement in industrial fora, like CEDT – Excellence Center for Transaction Dematerialization (membership of the Board of Directors), HCP - Health Cluster Portugal (representation of INESC TEC), DANOTEC – New Technologies and Defense Association (representation of INESC Porto), AIFF – Forest Industries Association (representation of INESC TEC, ITS Portugal – Intelligent Transportation Systems (membership of the Board of Directors), ELANET – European Local Authorities Association (membership of the Board of Directors) and Hillside Group – Non-Profit Corporation for Software Patterns promotion (vice-Presidency of the Board of Directors).

As a result of the successful MIELE and WiderMoS projects, a spin-off will be created in 2016 by team members to exploit the results of these two TEN-T projects, creating a new web platform for intermodal logistics contracting.

The cooperation with other INESC Centres has increased, both through joint participation in R&D projects (CONTEXTWA, LeanBigData, E-COMPARED, ICARUS, SARA, VCARDID, EYEFYRY, CAP@CIDADE, PGLOBAL and RTE) and by submitting new projects, like FOUREYES, SMILES, CORAL and NANOSTIMA

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	309	423	137	118	194	64%
European Union Programmes	300	185	80	191	310	62%
R&D Services and Consulting	295	282	438	580	619	7%
Other R&D sources		5	8	12		-100%
Other external sources			8		39	
Total	904	895	671	901	1.162	29%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	2	6%	181	16%
	National Programmes - QREN	1	3%	8	1%
	National Programmes – P2020				
	National Programmes - PICT	6	19%	5	0%
	European Union Programmes – FP7	3	9%	201	17%
	European Union Programmes – H2020				
	European Union Programmes - Other	2	6%	109	9%
	R&D Services and Consulting - National	16	50%	619	53%
	R&D Services and Consulting – European Union				
	R&D Services and Consulting - International				
	Other R&D sources	1	3%		
	Other external sources	1	3%	39	3%
	Internal				
Dominant Activity type	Basic Research	14	44%	506	44%
	Applied Research and Development	6	19%	386	33%
	Consulting	11	34%	231	20%
	Technology Transfer				
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other	1	3%	39	3%
Execution Status	Started	12	38%	285	25%
	Continuation	11	34%	507	44%
	Started and Concluded within the year				
	Concluded	9	28%	370	32%
Total		32		1.162	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	11	7	9	23	29	28
International Conference Proceedings with scientific referees	39	39	57	57	61	71
Books - Author	1		2			
Chapter in books	1	2	1	13	1	4
Publications (Editor)	1	1	3	2	1	4
Other Publications		2	2	13	3	7
Total	53	51	74	108	95	114

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	41
Doctoral	13
Total	54

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
MASSIVE	Maximino Bessa	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2013-01	FIN
CE4Blind	João Barroso	RES	PROG - NAT	FCT	PROJ UT Austin	INT	PROP	2015-05	INI
AAL4ALL	Ângelo Martins	CONS	PROG - NAT	POFC	PROJ MOBIL	NAT	PAR	2011-01	FIN
SIBILA	Rui Barros	RES	PROG - NAT	POR Norte		NAT	PROP	2013-01	FIN
NanoStima-RL2	João Barroso	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START
StopDepression	Artur Rocha	RES	PROG - EU	EEA		EU	PAR	2015-04	START
SeaBioData	Artur Rocha	RES	PROG - EU	EEA		EU	PAR	2015-07	START
E-Compared	Artur Rocha	RES	PROG - EU	FP7		EU	PAR	2014-01	CONT
CCDRN-EA	António Gaspar	CONS	SERV - NAT				CONT	2010-10	CONT
SARA	José Correia	CONS	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2012-05	FIN
OASRN	Rui Barros	CONS	SERV - NAT				CONT	2013-01	CONT
IPMAPS	Rui Barros	DES	SERV - NAT				CONT	2013-05	CONT
3Port	Lino Oliveira	CONS	SERV - NAT				CONT	2013-07	CONT
RAIA.TEC	Artur Rocha	DES	SERV - NAT				CONT	2014-01	FIN
vCardID	José Correia	DES	SERV - NAT				CONT	2014-01	CONT
EYEFY	Rui Barros	DES	SERV - NAT				CONT	2014-01	FIN
InMERSE	Benjamim Fonseca	RES	SERV - NAT				CONT	2014-07	FIN
WiderMOS	Rui Barros	DES	SERV - NAT				CONT	2014-09	CONT
RTE	José Correia	CONS	SERV - NAT				CONT	2015-05	START
DIGITAVE	Rui Barros	CONS	SERV - NAT				CONT	2015-04	START
DRIW2020	António Gaspar	CONS	SERV - NAT				CONT	2015-12	START
Consultoria	António Gaspar	CONS	SERV - NAT				CONT	2008-01	CONT
APDIC	Gabriel David	CONS	ORD	GULBENKIAN		NAT	CONT	2013-01	FIN
ACESSWEB	Ramiro Gonçalves	O	O				CONT	2015-01	START

Dominant Activity Type:

RES – Research
 DEV – Development
 CONS - Consulting
 TT - Technology Transfer
 NET - Network
 CONF - Conference
 TRAIN - Advanced Training
 INC - Incubation
 O - Other

Source:

PROG – NAT – National Programmes
 PROG – EU – European Union Programmes
 SERV - NAT - Supply of Services - National
 SERV - EU - Supply of Services - European Union
 SERV - INT - Supply of Services - International
 ORD - Other R&D Services
 O - Other External Services
 INT - Internal

Type:

IND – Individual Project
 NAT - National Cooperation
 EU - European Union Cooperation (EU+Associated Countries)
 INT - Internal Cooperation

Role INESCP:

PROP - Proponent
 PAR - Partner
 CONT - Prime Contractor
 SUB - Subcontractor
 MEMB - Member
 O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Martins,M, Cunha,A, Oliveira,I, Morgado,L, "Usability test of 3Dconnexion 3D mice versus keyboard plus mouse in Second Life undertaken by people with motor disabilities due to medullary lesions", UNIVERSAL ACCESS IN THE INFORMATION SOCIETY, vol.14, no.1, pp.5-16, MAR, 2015
2. Bianchi Piccinini,GFB, Rodrigues,CM, Leitao,M, Simoes,A, "Reaction to a critical situation during driving with Adaptive Cruise Control for users and non-users of the system", SAFETY SCIENCE, vol.72, pp.116-126, FEB, 2015
3. Sels,V, Coelho,J, Dias,AM, Vanhoucke,M, "Hybrid tabu search and a truncated branch-and-bound for the unrelated parallel machine scheduling problem", COMPUTERS & OPERATIONS RESEARCH, vol.53, pp.107-117, JAN, 2015
4. Paulino,N, Ferreira,JC, Cardoso,JMP, "A Reconfigurable Architecture for Binary Acceleration of Loops with Memory Accesses", ACM TRANSACTIONS ON RECONFIGURABLE TECHNOLOGY AND SYSTEMS, vol.7, no.4, pp.29:1-29:20, JAN, 2015
5. Barbosa,SM, Lopes,F, Correia,AD, Barbosa,S, Pereira,AC, Neves,LF, "Temporal variability of radon in a remediated tailing of uranium ore processing - the case of Urgeirica (central Portugal)", JOURNAL OF ENVIRONMENTAL RADIOACTIVITY, vol.142, pp.14-23, APR, 2015
6. Carvalho,DCM, Bessa,MEC, Magalhaes,LGM, Carrapatoso,EMEM, "Interaction Paradigms Versus Age-Related User Profiles: an Evaluation on Content Selection", IEEE LATIN AMERICA TRANSACTIONS, vol.13, no.2, pp.532-539, FEB, 2015
7. Cruz,G, Costa,A, Martins,P, Goncalves,R, Barroso,J, "Toward Educational Virtual Worlds: Should Identity Federation Be a Concern?", EDUCATIONAL TECHNOLOGY & SOCIETY, vol.18, no.1, pp.27-36, JAN, 2015
8. Freire,H, de Moura Oliveira,PBD, Solteiro Pires,EJS, Bessa,M, "Many-objective optimization with corner-based search", MEMETIC COMPUTING, vol.7, no.2, pp.105-118, JUN, 2015
9. Martins,J, Barroso,J, Goncalves,R, Sousa,A, Bacelar,M, Paredes,H, "Transforming e-procurement platforms for PEPPOL and WCAG 2.0 compliance the anogov-PEPPOL project", Lecture Notes in Electrical Engineering, vol.339, pp.973-980, 2015, 2015
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11. Pinto,P, Abreu,R, Cardoso,JMP, "Fault Detection in C Programs using Monitoring of Range Values: Preliminary Results", CoRR, vol.abs/1505.01878, 2015-06-01, 2015
12. Lopes,CT, Ribeiro,C, "Effects of terminology on health queries: An analysis by user's health literacy and topic familiarity", Advances in Librarianship, vol.39, pp.145-184, 2015-6-12, 2015
13. Herrador,M, Carvalho,A, Feito,FR, "An Incentive-Based Solution of Sustainable Mobility for Economic Growth and CO2 Emissions Reduction", SUSTAINABILITY, vol.7, no.5, pp.6119-6148, MAY, 2015
14. Silva,PB, Eisemann,E, Bidarra,R, Coelho,A, "Procedural Content Graphs for Urban Modeling", INTERNATIONAL JOURNAL OF COMPUTER GAMES TECHNOLOGY, vol.2015, pp.1-15, 2015, 2015
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16. Nogueira,PA, Torres,V, Rodrigues,R, Oliveira,E, "An annotation tool for automatically triangulating individuals' psychophysiological emotional reactions to digital media stimuli", Entertainment Computing, vol.9-10, pp.19-27, 2015-6, 2015

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18. Freitas,CF, Meireles,A, Figueiredo,L, Barroso,J, Silva,A, Ramos,C, "Context aware middleware in ambient intelligent environments", International Journal of Computational Science and Engineering, vol.10, no.4, pp.347-358, 2015-08-28, 2015
19. Kar,M, Nunes,S, Ribeiro,C, "Summarization of changes in dynamic text collections using Latent Dirichlet Allocation model", INFORMATION PROCESSING & MANAGEMENT, vol.51, no.6, pp.809-833, NOV, 2015
20. Nogueira,PA, Rodrigues,R, Oliveira,E, Nacke,LE, "Modelling human emotion in interactive environments: Physiological ensemble and grounded approaches for synthetic agents", Web Intelligence, vol.13, no.3, pp.195-214, 2015-08-27, 2015
21. Melo,M, Bessa,M, Debattista,K, Chalmers,A, "Evaluation of Tone-Mapping Operators for HDR Video Under Different Ambient Luminance Levels", COMPUTER GRAPHICS FORUM, vol.34, no.8, pp.38-49, DEC, 2015
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25. Barroso,I, Hartmann,N, Ribeiro,C, "Metadata Crosswalk for a museum collection in a Thematic digital library", Journal of Library Metadata, vol.15, no.1, pp.36-49, 2015-1-2, 2015
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27. Velasco,C, Weber,G, Barroso,J, Mohamad,Y, Paredes,H, "Preface", Procedia Computer Science, vol.67, pp.1, 2015, 2015
28. Martins,J, Gonçalves,R, Santos,V, Cota,MP, Oliveira,T, Branco,F, "A proposal for a social e-Learning model [Proposta de um modelo de e-learning social]", RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao, vol.2015, no.16, pp.92-107, 2015

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1. Freire,HF, de Moura Oliveira,PBD, Solteiro Pires,EJS, Bessa,M, "Many-Objective PSO PID Controller Tuning", CONTROLO'2014 - PROCEEDINGS OF THE 11TH PORTUGUESE CONFERENCE ON AUTOMATIC CONTROL, vol.321, pp.183-192, 2015, 2015
2. Oliveira,PM, Vrancic,D, Freire,HF, "Dual Mode Feedforward-Feedback Control System", CONTROLO'2014 - PROCEEDINGS OF THE 11TH PORTUGUESE CONFERENCE ON AUTOMATIC CONTROL, vol.321, pp.241-250, 2015, 2015
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6. Almeida,R, Maio,P, Oliveira,P, Joao,B, "Towards reusing data cleaning knowledge", Advances in Intelligent Systems and Computing, vol.353, pp.143-150, 2015, 2015
7. Moreira,F, Cota,MP, Goncalves,R, "The influence of the use of mobile devices and the cloud computing in organizations", Advances in Intelligent Systems and Computing, vol.353, pp.275-284, 2015, 2015
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13. Moreira,RMLM, Paiva,ACR, "A novel approach using Alloy in domain-specific language engineering", MODELSWARD 2015 - 3rd International Conference on Model-Driven Engineering and Software Development, Proceedings, pp.157-164, 2015-08-06, 2015
14. Cruz,A, Morgado,L, Paredes,H, Fonseca,B, Martins,P, "Fitting three dimensional virtual worlds into CSCW", Proceedings of the 2015 IEEE 19th International Conference on Computer Supported Cooperative Work in Design, CSCWD 2015, pp.419-424, 2015-09-07, 2015
15. Fernandes,H, Sousa,A, Paredes,H, Filipe,V, Barroso,J, "Feature Detection Applied to Context-Aware Blind Guidance Support", UNIVERSAL ACCESS IN HUMAN-COMPUTER INTERACTION: ACCESS TO THE HUMAN ENVIRONMENT AND CULTURE, UAHCI 2015, PT IV, vol.9178, pp.129-138, 2015-07-20, 2015
16. Nunes,RR, Pedrosa,D, Fonseca,B, Paredes,H, Cravino,J, Morgado,L, Martins,P, "Enhancing Students' Motivation to Learn Software Engineering Programming Techniques: A Collaborative and Social Interaction Approach", UNIVERSAL ACCESS IN HUMAN-COMPUTER INTERACTION: ACCESS TO LEARNING, HEALTH AND WELL-BEING, UAHCI 2015, PT III, vol.9177, pp.189-201, 2015-07-20, 2015
17. Paredes,H, Fernandes,H, Sousa,A, Fortes,R, Koch,F, Filipe,V, Barroso,J, "CanIHelp: A platform for inclusive collaboration", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9176, pp.474-483, 2015-07-20, 2015
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19. Faria,AR, Martins,C, Almeida,A, Goncalves,R, "Learning Platform Emotional Learning", PROCEEDINGS OF THE 2015 10TH IBERIAN CONFERENCE ON INFORMATION SYSTEMS AND TECHNOLOGIES (CISTI 2015), 2015-6, 2015
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21. Ribeiro,TPB, Paiva,ACR, "ILearnTest: Educational game for learning software testing [ILearnTest: Jogo Educativo para Aprendizagem de Teste de Software]", 2015 10th Iberian Conference on Information Systems and Technologies, CISTI 2015, 2015
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26. Carvalho,S, Pavia,J, Queiros,A, Rocha,NP, Costa,V, "Platform to Develop Applications to Support Care Providing", PROCEEDINGS OF THE 2015 10TH IBERIAN CONFERENCE ON INFORMATION SYSTEMS AND TECHNOLOGIES (CISTI 2015), 2015-6, 2015
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29. Branco,F, Martins,J, Goncalves,R, Alves,J, "Amplified Sensing System to Support Decision A Proposal for an Extension to a Mushroom Farm Process Control System", INNOVATION VISION 2020: FROM REGIONAL DEVELOPMENT SUSTAINABILITY TO GLOBAL ECONOMIC GROWTH, VOL I-VI, pp.2020-2030, 2015
30. Leong,PHW, Amano,H, Anderson,J, Bertels,K, Cardoso,JMP, Diessel,O, Gogniat,G, Hutton,M, Lee,J, Luk,W, Lysaght,P, Platzner,M, Prasanna,VK, Rissa,T, Silvano,C, So,H, Wang,Y, "Significant papers from the first 25 years of the FPL conference", 25th International Conference on Field Programmable Logic and Applications, FPL 2015, pp.1-3, 2015-9, 2015
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32. Bispo,J, Reis,L, Cardoso,JMP, "Techniques for efficient MATLAB-to-C compilation", Proceedings of the 2nd ACM SIGPLAN International Workshop on Libraries, Languages, and Compilers for Array Programming, ARRAY@PLDI, Portland, OR, USA, June 15 - 17, 2015, pp.7-12, 2015-06-23, 2015
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34. Carvalho,T, Pinto,P, Cardoso,JMP, "Programming strategies for contextual runtime specialization", Proceedings of the 18th International Workshop on Software and Compilers for Embedded Systems, SCOPES 2015, pp.3-11, 2015, 2015
35. Nobre,R, Martins,LGA, Cardoso,JMP, "Use of previously acquired positioning of optimizations for phase ordering exploration", Proceedings of the 18th International Workshop on Software and Compilers for Embedded Systems, SCOPES 2015, pp.58-67, 2015, 2015

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G.3. Books (Author)

(Void)

G.4. Chapter/Paper in Books

1. Coelho,J, Vanhoucke,M, "The multi-mode resource-constrained project scheduling problem", Handbook on Project Management and Scheduling Vol. 1, pp.491-511, 2014-10-8, 2015
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3. Paredes,H, Fernandes,H, Sousa,A, Fernandes,L, Koch,F, Fortes,R, Filipe,V, Barroso,J, "Exploring smart environments through human computation for enhancing blind navigation", Communications in Computer and Information Science, vol.541, pp.66-76, 2015, 2015
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G.5. Publications (Editor)

1. Velasco,CA, Weber,G, Barroso,J, Mohamad,Y, Paredes,H, "Proceedings of the 6th International Conference on Software Development for Enhancing Accessibility and Fighting Info-exclusion, DSAI 2015, Sankt Augustin, Germany, June 10-12, 2015", DSAI, vol.67, 2015-11-14, 2015
2. Plessl,C, Baz,DE, Cong,G, Cardoso,JMP, Veiga,L, Rauber,T, "18th IEEE International Conference on Computational Science and Engineering, CSE 2015, Porto, Portugal, October 21-23, 2015", CSE, 2015
3. Bozorgzadeh,E, Cardoso,JMP, Abreu,R, Memik,SO, "13th IEEE International Conference on Embedded and Ubiquitous Computing, EUC 2013, Porto, Portugal, October 21-23, 2015", EUC, 2015
4. Agosta,G, Silvano,C, Cardoso,JMP, Hübner,M, "Proceedings of the 6th Workshop on Parallel Programming and Run-Time Management Techniques for Many-core Architectures and the 4th

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G.6. Other Publications

1. Morgado,L, Fernandez Manion,BF, Guetl,C, "Guest Editorial: Overcoming the Technological Hurdles Facing Virtual Worlds in Education: The Road to Widespread Deployment", EDUCATIONAL TECHNOLOGY & SOCIETY, vol.18, no.1, pp.1-2, JAN, 2015
2. Barroso,J, Sandnes,FE, Paredes,H, Hadjileontiadis,L, Martins,P, "Software for enhancing accessibility and fighting info-exclusion", UNIVERSAL ACCESS IN THE INFORMATION SOCIETY, vol.14, no.1, pp.1-3, MAR, 2015
3. Cardoso,JMP, Diniz,PC, Morrow,K, "Guest Editorial FPL 2013", ACM TRANSACTIONS ON RECONFIGURABLE TECHNOLOGY AND SYSTEMS, vol.8, no.2, pp.8, APR, 2015
4. Barbosa,SM, Donner,RV, Steinitz,G, "Radon applications in geosciences - Progress & perspectives", EUROPEAN PHYSICAL JOURNAL-SPECIAL TOPICS, vol.224, no.4, pp.597-603, MAY, 2015
5. Goehringer,D, Santambrogio,MD, Cardoso,JMP, Bertels,K, "Guest editorial ARC 2014", ACM Transactions on Reconfigurable Technology and Systems, vol.9, no.1, pp.5, 2015-11-2, 2015
6. Goehringer,D, Santambrogio,MD, Cardoso,JMP, Bertels,K, "SPECIAL SECTION ON THE 2014 INTERNATIONAL SYMPOSIUM ON APPLIED RECONFIGURABLE COMPUTING", ACM TRANSACTIONS ON RECONFIGURABLE TECHNOLOGY AND SYSTEMS, vol.9, no.1, NOV, 2015
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ROBOTICS AND INTELLIGENT SYSTEMS

A. DESCRIPTION OF THE RESEARCH CENTRE

The Centre for Robotics and Intelligent Systems will follow, in its internal organization, the general model adopted at INESC TEC. It will be governed by two Coordinators and a Coordinating Council composed of 3 to 5 PhDs, having responsibilities over areas of work and research. The Co-coordinators will be António Paulo Gomes Mendes Moreira (indicated as the PI) and Eduardo Alexandre Pereira da Silva.

The project leaders will respond to the Coordinating Council in what refers to the execution of projects and meeting financial sustainability goals as well as scientific productivity targets.

This Coordinating Council will also suggest to the Direction of INESC TEC the form of the participation of CROB in the Industrial and Innovation cluster and the Networked Intelligent Systems cluster coordination.

This council has meetings every two weeks. It supports the coordinators taking decisions and allows important information to flow.

The group has also a secretariat and a technical support for hardware development.

SCIENTIFIC GOALS

The main goal of CROB is the development of innovative robotic solutions and intelligent systems for different application areas where standard platforms are not optimal. Research activities address not only relevant problems in robotics but also application areas where technologies used in robotics play an important role, like control, automation, simulation, modeling, intelligent systems, etc.

The activity is grounded in the following scientific domains:

- Mobile Robotics: Robotic platforms; Control of mobile robots; AGVs.
- Marine Robotics: Design of surface and underwater autonomous vehicles; underwater positioning and navigation, multiple platform systems, supervision of autonomous platforms, robotic based environment monitoring.
- Cooperative robotics: human-machine cooperation and co-working.
- Industrial Mobile Robots: Warehouses and Logistics applications.
- Industrial Manipulators: Rapid teaching and programming interfaces; Hyper-flexible cells.
- Intelligent sensors: Smart sensors; Adaptive sampling strategies in environment monitoring.
- Intelligent control and simulation: control algorithms for complex dynamics systems. Simulation applications.

The CROB is engaged in discovering and developing fundamental scientific principles and practices, such as perception, control and planning, which are applicable to intelligent robot systems and other complex dynamic systems. In addition, the goal of this group is to facilitate the technology transfer of its research to solutions to real world problems for a wide range of application domains, namely, robots that navigate through complex indoor and outdoor spaces and advanced flexible manufacturing support systems.

Finally, there is the awareness that the challenges that CROB faces may only be met in alliance with other Research Groups at INESC TEC. This is why CROB will be involved in both the clusters of Industrial and Innovation and the Networked Intelligent Systems.

STRATEGIC GOALS

Among distinct objectives, it is worth mentioning the big challenge of the Deep Sea exploration, motivated by partnerships in Portugal and Europe with raw materials technology industry and by the extremely large EEZ of Portugal (10th in the world). INESC TEC has designed a roadmap for the coming 5 years where CROB plays an important role.

It is due to this strategic goal that important structural investment is foreseen in the period 2014-2020. The acquisition of vital equipment to allow the development of devices and tests compatible with deep sea stressing conditions is a must (e.g., a hyperbaric chamber – which, however, will serve not only CROB but also

other research centres at INESC TEC. For example, the Centre for Applied Photonics CAP will also benefit from this infrastructure and will use it in testing sensing system behavior under deep sea pressure and temperature).

Other strategic goal is to establish INESC TEC as an international reference in the industrial robotics sector making bridges between internationally relevant research centres and local industry. The main research lines are closely related with European research initiatives (the Robotics PPP and the Factories of the Future PPP), and include mobile robotics for logistics, mobile manipulators, human-robot collaboration scenarios and dual-arm robot manipulators. Applications scenarios will go from traditional settings such as assembly welding or painting, to new cases including agriculture harvesting, applications for civil engineering among others.

ADVANCED EDUCATION

CROB will reinforce its contribution to the PhD joint Programme in EEC of FEUP together with CMU (Carnegie Mellon University) and MIT (Massachusetts Institute of Technology).

B. MAIN ACHIEVEMENTS

CARLoS - CooperAtive Robot for Large Spaces manufacturing (2013-2015) - 7th Framework Programme for Research; Funding Scheme : Research for SMEs: a mobile robot as co-worker for fit-out operations inside blocks of ship superstructures.

FOCUS - Advances in FOestry Control and AUtomatic Systems in Europe; 7th Framework Programme for Research; Funding Scheme : SME-targeted collaborative projects: advancing forestry control and automation through the development of an integrated technological solution that combines predictive control with processing and planning processes.

STAMINA - Sustainable and Reliable Robotics for Part Handling in Manufacturing Automation; 7th Framework Programme for Research; Funding Scheme : ICT – Information and communication technologies: holistic approach by partnering with experts in each necessary key fields, thus building on previous R&D to develop a fleet of autonomous and mobile industrial robots with different sensory, planning and physical capabilities for jointly solving three logistic and handling tasks: De-palletizing, Bin-Picking and Kitting.

CLARiSSA - Cooperative Dual-Arm Robot for Structural Steel fAbriCation; 7th Framework Programme for Research; Funding Scheme SMERobotics: path planning for dual arm robotic welding.

ICARUS - Integrated Components for Assisted Rescue and Unmanned Search operations; FP7: unmanned SAR technologies for detecting, locating and rescuing humans.

SUNNY - Smart UNmanned aerial vehicle sensor Network for detection of border crossing; FP7: new tool for collecting real-time information in operational scenarios, capable of improving the effectiveness of the EU border monitoring.

iVAMOS! designs and manufacture innovative automated excavation equipment and environmental impact monitoring tools that will be used to perform field tests in four mine sites across Europe with a range of rock hardness and pit morphology.

TURTLE – Autonomous Support System for SubSea Operations: robotic ascend and descent energy efficient technologies to be incorporated in robotic vehicles used for dual-use (civil and military).

SCAN – Aquaculture Calibration System- aims to develop a robotic system for biomass and calibration of Pleuronectiformes species in underwater aquaculture tanks. The system works completely autonomous and its partially submerge, being the first non-intrusive and without fish injuries. It can be adjust dynamically and is built using laser and computer vision techniques to obtain underwater perception capabilities.

RobArq - Robotic Technologies for Non-Standard Design and Construction in Architecture: robotic fabrication of complex geometries and variable customized assemblies employing Portuguese materials (e.g. cork, ceramics, wood);

OCHERA - Optimal Control: Health, Energy and Robotics Applications: analyze, simulate and solve numerically various problems modeling situations in areas as different as health, energy and robotics.

BEST CASE - Better Science Through Cooperative Advanced Synergetic Efforts; Research Line 4 – Cooperation and perception for augmented autonomy: application of new concepts of autonomous systems (robots).

Produtech – Systems and applications for mobile and flexible robotics, organized in three activities.

The Centre established large cooperation with other Centres through projects and proposal submission as well as participation in other cross-centres activities.

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2013 - 2014
	2011	2012	2013	2014	2015	
National Programmes	107	208	238	278	233	-16%
European Union Programmes		77	332	523	876	67%
R&D Services and Consulting	332	297	131	120	138	15%
Other R&D sources					4	
Other external sources						
Total	439	582	701	921	1.251	36%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	2	8%	18	1%
	National Programmes - QREN	1	4%	114	9%
	National Programmes – P2020	1	4%		
	National Programmes - PICT	3	12%	101	8%
	European Union Programmes – FP7	6	23%	699	56%
	European Union Programmes – H2020	1	4%	177	14%
	European Union Programmes - Other	3	12%		
	R&D Services and Consulting - National	5	19%	138	11%
	R&D Services and Consulting – European Union	2	8%		
	R&D Services and Consulting - International	1	4%		
	Other R&D sources	1	4%	4	0%
	Other external sources				
	Internal				
Dominant Activity type	Basic Research	18	69%	1.113	89%
	Applied Research and Development	3	12%	15	1%
	Consulting	4	15%	123	10%
	Technology Transfer	1	4%		
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	5	19%	55	4%
	Continuation	8	31%	528	42%
	Started and Concluded within the year	5	19%	181	14%
	Concluded	8	31%	487	39%
Total		26		1.251	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	5	6	10	21	19	27
International Conference Proceedings with scientific referees	35	24	31	49	43	100
Books - Author		1		1	1	1
Chapter in books	1	3	1	4	4	3
Publications (Editor)				1		
Other Publications					6	4
Total	41	34	42	76	73	135

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	63
Doctoral	5
TOTAL	68

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
OCHERA	António Paulo Moreira	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PAR	2013-07	FIN
ROBARQ	António Paulo Moreira	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PAR	2013-07	FIN
TURTLE	Eduardo Silva	RES	PROG - NAT	POFC	PROJ CO-PROM	NAT	PAR	2014-01	FIN
CoopWeld	Germano Veiga	RES	PROG - NAT	NORTE2020	PROJ CO-PROM	NAT	PAR	2015-12	START
Cooperation	António Paulo Moreira	RES	PROG - NAT	POR Norte		NAT	PROP	2013-01	FIN
MarineEye	Eduardo Silva	RES	PROG - EU	EEA		NAT		2015-07	START-FIN
ICARUS	Aníbal Matos	RES	PROG - EU	FP7		UE	PAR	2012-02	CONT
SUNNY	Eduardo Silva	RES	PROG - EU	FP7		UE	PAR	2014-01	CONT
STAMINA	Germano Veiga	RES	PROG - EU	FP7		UE	PAR	2013-10	CONT
CARLoS	Germano Veiga	RES	PROG - EU	FP7		UE	PAR	2013-09	FIN
CLARISSA	Germano Veiga	RES	PROG - EU	FP7		UE	PAR	2014-01	CONT
VAMOS	Eduardo Silva	RES	PROG - EU	H2020		UE	PAR	2015-02	START-FIN
EDA-SAVEWATE	Nuno Cruz	DEV	SERV - EU				CONT	2012-01	CONT
Evologics	Nuno Cruz	TT	SERV - EU				CONT	2013-05	CONT
SCAN	Eduardo Silva	CONS	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2014-01	FIN
AutoClassII	António Paulo Moreira	CONS	SERV - NAT				CONT	2015-01	START
Submarino_Whale	António Paulo Moreira	DEV	SERV - NAT				CONT	2015-04	START
Consultoria	António Paulo Moreira	CONS	SERV - NAT				CONT	2014-01	CONT
Demo_Drone	José Miguel Almeida	CONS	SERV - NAT				CONT	2015-05	START
SUB.2	Aníbal Matos	DEV	SERV - INT				CONT	2012-01	START
CINMarS	Eduardo Silva	RES	ORD	ESA				2015-03	START-FIN

Dominant Activity Type:

RES – Research
 DEV – Development
 CONS - Consulting
 TT - Technology Transfer
 NET - Network
 CONF - Conference
 TRAIN - Advanced Training
 INC - Incubation
 O - Other

Source:

PROG – NAT – National Programmes
 PROG – EU – European Union Programmes
 SERV - NAT - Supply of Services - National
 SERV - EU - Supply of Services - European Union
 SERV - INT - Supply of Services - International
 ORD - Other R&D Services
 O - Other External Services
 INT - Internal

Type:

IND – Individual Project
 NAT - National Cooperation
 EU - European Union Cooperation (EU+Associated Countries)
 INT - Internal Cooperation

Role INESCP:

PROP - Proponent
 PAR - Partner
 CONT - Prime Contractor
 SUB - Subcontractor
 MEMB - Member
 O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Aparicio,J, Jimenez,A, Alvarez,FJ, Urena,J, De Marziani,C, de Diego,D, Cruz,N, Campos,H, "Accurate detection of spread-spectrum modulated signals in reverberant underwater environments", APPLIED ACOUSTICS, vol.88, pp.57-65, FEB, 2015
2. Lima,PU, Ahmad,A, Dias,A, Conceicao,AGS, Moreira,AP, Silva,E, Almeida,L, Oliveira,L, Nascimento,TP, "Formation control driven by cooperative object tracking", ROBOTICS AND AUTONOMOUS SYSTEMS, vol.63, no.P1, pp.68-79, JAN, 2015
3. Morgado,ML, Morgado,LF, Silva,N, Morais,R, "Mathematical modelling of cylindrical electromagnetic vibration energy harvesters", INTERNATIONAL JOURNAL OF COMPUTER MATHEMATICS, vol.92, no.1, pp.101-109, JAN 2, 2015
4. Oliveira,M, Domingo Sappa,AD, Santos,V, "A Probabilistic Approach for Color Correction in Image Mosaicking Applications", IEEE TRANSACTIONS ON IMAGE PROCESSING, vol.24, no.2, pp.508-523, FEB, 2015
5. Silva,H, Bernardino,A, Silva,E, "Probabilistic Egomotion for Stereo Visual Odometry", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.77, no.2, pp.265-280, FEB, 2015
6. Faria,BM, Reis,LP, Lau,N, "Adapted Control Methods for Cerebral Palsy Users of an Intelligent Wheelchair", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.77, no.2, pp.299-312, FEB, 2015
7. Pinto,AM, Moreira,AP, Costa,PG, "A Localization Method Based on Map-Matching and Particle Swarm Optimization", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.77, no.2, pp.313-326, FEB, 2015
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9. Freire,H, de Moura Oliveira,PBD, Solteiro Pires,EJS, Bessa,M, "Many-objective optimization with corner-based search", MEMETIC COMPUTING, vol.7, no.2, pp.105-118, JUN, 2015
10. Nascimento,TP, Costa,LFS, Conceição,AGS, Moreira,AP, "Nonlinear Model Predictive Formation Control: An Iterative Weighted Tuning Approach", Journal of Intelligent and Robotic Systems: Theory and Applications, vol.80, no.3-4, pp.441-454, 2015
11. Silva,P, Santiago,C, Reis,LP, Sousa,A, Mota,J, Welk,G, "Assessing physical activity intensity by video analysis", PHYSIOLOGICAL MEASUREMENT, vol.36, no.5, pp.1037-1046, MAY, 2015
12. Malheiro,B, Silva,M, Ribeiro,MC, Guedes,P, Ferreira,P, "The European Project Semester at ISEP: the challenge of educating global engineers", European Journal of Engineering Education, vol.40, no.3, pp.328-346, 2014-10-16, 2015
13. Neto,P, Mendes,N, Paulo Moreira,AP, "Kalman filter-based yaw angle estimation by fusing inertial and magnetic sensing: a case study using low cost sensors", SENSOR REVIEW, vol.35, no.3, pp.244-250, 2015-6-15, 2015
14. de Moura Oliveira,PBD, Solteiro Pires,EJS, Novais,P, "Design of Posicast PID control systems using a gravitational search algorithm", NEUROCOMPUTING, vol.167, pp.18-23, NOV 1, 2015
15. Pinto,T, Barreto,J, Praca,I, Sousa,TM, Vale,Z, Solteiro Pires,EJS, "Six thinking hats: A novel metalearner for intelligent decision support in electricity markets", DECISION SUPPORT SYSTEMS, vol.79, pp.1-11, NOV, 2015
16. Faria,BM, Goncalves,J, Reis,LP, Rocha,A, "A Clinical Support System Based on Quality of Life Estimation", JOURNAL OF MEDICAL SYSTEMS, vol.39, no.10, pp.114:1-114:11, OCT, 2015
17. Veloso,B, Malheiro,B, Carlos Burguillo,JC, "A MULTI-AGENT BROKERAGE PLATFORM FOR MEDIA CONTENT RECOMMENDATION", INTERNATIONAL JOURNAL OF APPLIED MATHEMATICS AND COMPUTER SCIENCE, vol.25, no.3, pp.513-527, AUG, 2015

18. Pinto,T, Vale,Z, Praca,I, Solteiro Pires,EJS, Lopes,F, "Decision Support for Energy Contracts Negotiation with Game Theory and Adaptive Learning", ENERGIES, vol.8, no.9, pp.9817-9842, SEP, 2015
19. Faria,BM, Reis,LP, Lau,N, "A Methodology for Creating an Adapted Command Language for Driving an Intelligent Wheelchair", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.80, no.3-4, pp.609-623, DEC, 2015
20. Nascimento,TP, Costa,LFS, Conceicao,AGS, Moreira,AP, "Nonlinear Model Predictive Formation Control: An Iterative Weighted Tuning Approach", JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.80, no.3-4, pp.441-454, DEC, 2015
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1. Moreira,AP, Matos,A, Veiga,G, "CONTROLO?2014 ? Proceedings of the 11th Portuguese Conference on Automatic Control", Lecture Notes in Electrical Engineering, 2015

G.4. Chapter/Paper in Books

1. Ferreira,P, Malheiro,B, Guedes,P, Silva,M, "Towards Active Course Marks for Autonomous Sailing Competitions", Robotic Sailing 2014, pp.67-75, 2015, 2015
2. Costa,CM, Sobreira,HM, Sousa,AJ, Veiga,G, "3 DoF/6 DoF Localization System for Low Computing Power Mobile Robot Platforms", Cutting Edge Research in Technologies, 2015-10-21, 2015
3. Reis,LP, Moreira,AP, Lima,PU, Montano,L, Muñoz Martinez,V, "Robot 2015: second iberian robotics conference: Advances in robotics, volume 2", Advances in Intelligent Systems and Computing, vol.418, 2015

G.5. Publications (Editor)

(Void)

G.6. Other Publications

1. Moreira,AP, Matos,A, Veiga,G, "Lecture Notes in Electrical Engineering: Preface", Lecture Notes in Electrical Engineering, vol.321 LNEE, 2015
2. Lau,N, Moreira,AP, Ventura,R, Faria,BM, "Special Issue Robótica 2014", Journal of Intelligent and Robotic Systems: Theory and Applications, vol.80, no.3-4, pp.363-364, 2015-9-16, 2015
3. Costa,AP, Faria,BM, Reis,LP, "Research through development: When words "Count" [Investigação através do desenvolvimento: Quando as palavras "Contam"]", RISTI - Revista Iberica de STI, vol.2015,
4. Valente,A, Morais,R, Marques,L, Almeida,L, "Message from the chairs", Proceedings - 2015 IEEE International Conference on Autonomous Robot Systems and Competitions, ICARSC 2015, pp.ix, 2015

INNOVATION, TECHNOLOGY AND ENTREPRENEURSHIP

A. DESCRIPTION OF THE RESEARCH CENTRE

With the joint coordination of João Claro and Alexandra Xavier, in 2015, the Center for Innovation, Technology, and Entrepreneurship – CITE – focused its R&D activities in the following areas:

- Technology Management & Technology Policy
- Technology Entrepreneurship
- Innovation Management & Fuzzy Front End of Innovation

CITE carries out R&D, advanced consulting, and executive education broadly in the areas of Technology Management, Innovation Management, and Technology Entrepreneurship. The center seeks to promote the valorization of the knowledge it creates, by developing conceptual frameworks, methodologies, tools, and executive programs, to be provided to private and public organizations.

The specific objectives for CITE, in 2015-2020, are the following:

Technology Management & Technology Policy :

- look into the ways companies create, appropriate, and deliver value from technology, to improve the understanding of how it can be used to create and sustain competitive advantage; a particular attention is to be dedicated to the topics of technology roadmapping, and implementation of technological innovations;
- study strategies and policies for the use and control of technology for the benefit of communities; priority is to be given to the design of complex networked infrastructures with flexibility, to enhance their performance in relation to uncertain future conditions of operation, and to improving methods for the design of engineering systems aiming at achieving a better integration of engineering, management and social sciences aspects that are traditionally considered individually.

Technology Entrepreneurship:

- improve the knowledge of how new technological businesses form, survive and grow; a focus is to be placed on understanding the factors that support, delay, or block entrepreneurial intentions and activities of university researchers, in the earliest stages of entrepreneurial ventures, and the ways different organisational solutions, such as pre-incubation and proof-of-concept centres address the equity gap problem in early stages of commercialisation.

Innovation Management & Fuzzy Front End of Innovation:

- study the best practices on innovation management, methodologies and tools, that allow companies and organizations to implement and manage their innovation systems in an efficient and responsible way;
- look into how to combine methods and tools based on advanced concepts and trends in various areas, such as IT business systems, business integration, information and communication technologies and business analysis and modelling, to develop multidisciplinary approaches suited to the Fuzzy Front End of Innovation.

B. MAIN ACHIEVEMENTS

In 2015, in the area of research, CITE completed a very successful project, developed in the scope of the MIT Portugal Program, focused on the problem of forest fires in Portugal, adopting an Engineering Systems perspective. The project created guidelines and tools to support the improvement of the performance of the forest fire management system, which cover, in a cohesive and integrated manner, prevention, suppression, and even forest management. FIRE-ENGINE was considered by the members of its Stakeholder Committee, by the academic community, and by well-informed forest and fire managers, the first research project to develop an integrated image of the Portuguese forest fire management system, in particular from the point of view of technology management and policy.

Still in the area of research, the postdoctoral researcher Sérgio Costa, received the Heizer Award, from the Academy of Management's Entrepreneurship Division, which recognizes the best dissertation worldwide in the area of entrepreneurship. Sérgio Costa's PhD research, conducted in the University of Strathclyde, in the UK, and hosted in part at INESC TEC, studied the evolution of business models in early stage academic spinoffs.

An additional important recognition of the research carried out in CITE is the fact that the paper "Forest fire management to avoid unintended consequences: A case study of Portugal using system Dynamics", co-authored by João Claro and Abílio Pacheco in the scope of the FIRE-ENGINE project, became a required reading in the first class of the "Introduction to System Dynamics" course, in the Sloan School of Management, at MIT, the birthplace of System Dynamics.

In 2015, it was also of high relevance the strengthening of the research collaborations between CITE and other centers of INESC TEC, in particular with the new projects SCREEN-DR (CMU Portugal Program), with C-BER, SafeCloud (H2020), with HASLab, and the horizontal research line in Technology Management and Policy cutting across all INESC TEC's integrated projects proposed and approved in 2015.

Finally, in the area of advanced consulting, in 2015 CITE maintained, under the leadership of Alexandra Xavier, a very expressive and dynamic participation in the national consortium of the Enterprise Europe Network, as well as an active collaboration with ANJE, Universidade do Porto, UPTEC, and UPIN, in the support to entrepreneurship events

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	89	253	155	28		-100%
European Union Programmes		62	55	16	147	819%
R&D Services and Consulting	81	24	23	47	63	34%
Other R&D sources						
Other external sources	4	10		-3		-100%
Total	174	349	233	88	210	139%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	1	6%		
	National Programmes - QREN				
	National Programmes – P2020	1	6%		
	National Programmes - PICT	7	44%		
	European Union Programmes – FP7				
	European Union Programmes – H2020	2	13%	33	16%
	European Union Programmes - Other	2	13%	114	54%
	R&D Services and Consulting - National	2	13%	63	30%
	R&D Services and Consulting – European Union				
	R&D Services and Consulting - International				
	Other R&D sources				
	Other external sources	1	6%		
	Internal				
Dominant Activity type	Basic Research	11	69%	53	25%
	Applied Research and Development				
	Consulting	2	13%	63	30%
	Technology Transfer				
	Network	2	13%	94	45%
	Conference				
	Advanced Training				
	Incubation	1	6%		
	Other				
Execution Status	Started	11	69%	94	45%
	Continuation	2	13%	33	16%
	Started and Concluded within the year				
	Concluded	3	19%	83	40%
Total		16		210	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	21	21	22	19	19	6
International Conference Proceedings with scientific referees	13	10	11	22	9	1
Books - Author	3		1		1	1
Chapter in books	1		2			3
Publications (Editor)	1		1			
Other Publications	16	13	2	9	2	2
Total	55	44	39	50	31	13

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	10
Doctoral	3
Total	13

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
IN&OUT	Alexandra Xavier	RES	PROG - NAT	NORTE2020		NAT	PAR	2015-12	START
STAMAR	Alexandra Xavier	RES	PROG - EU	INTERREG		EU	PAR	2014-03	FIN
EEN	Alexandra Xavier	NET	PROG - EU	COSME		EU	PAR	2015-01	START
KAM	Alexandra Xavier	NET	PROG - EU	H2020		EU	PAR	2015-01	START
PASS	Alexandra Xavier	CONS	SERV - NAT				CONT	2014-01	FIN
Consultoria	Alexandra Xavier	CONS	SERV - NAT				CONT	2008-01	CONT
Let-in	Alexandra Xavier	INC	O				CONT	2008-01	FIN

Dominant Activity Type:

RES – Research
DEV – Development
CONS - Consulting
TT - Technology Transfer
NET - Network
CONF - Conference
TRAIN - Advanced Training
INC - Incubation
O - Other

Source:

PROG – NAT – National Programmes
PROG – EU – European Union Programmes
SERV - NAT - Supply of Services - National
SERV - EU - Supply of Services - European Union
SERV - INT - Supply of Services - International
ORD - Other R&D Services
O - Other External Services
INT - Internal

Type:

IND – Individual Project
NAT - National Cooperation
EU - European Union Cooperation (EU+Associated Countries)
INT - Internal Cooperation

Role INESCP:

PROP - Proponent
PAR - Partner
CONT - Prime Contractor
SUB - Subcontractor
MEMB - Member
O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Loureiro,MV, Claro,J, Pereira,PJ, "Capacity expansion in transmission networks using portfolios of real options", INTERNATIONAL JOURNAL OF ELECTRICAL POWER & ENERGY SYSTEMS, vol.64, pp.439-446, JAN, 2015
2. Castro,H, Andrade,MT, Almeida,F, Tropea,G, Melazzi,NB, Mousas,AS, Kaklamani,DI, Chiariglione,L, Difino,A, "Semantically connected web resources with MPEG-21", MULTIMEDIA TOOLS AND APPLICATIONS, vol.74, no.2, pp.439-462, JAN, 2015
3. Cruz,SS, Teixeira,AAC, "The neglected heterogeneity of spatial agglomeration and co-location patterns of creative employment: evidence from Portugal", ANNALS OF REGIONAL SCIENCE, vol.54, no.1, pp.143-177, JAN, 2015
4. Almeida,F, Bolaert,H, Dowdall,S, Lourenco,J, Milczarski,P, "The WalkAbout framework for contextual learning through mobile serious games", Education and Information Technologies, vol.20, no.3, pp.415-428, 2013-11-8, 2015
5. Teixeira,AAC, Caiado,A, Africano,AP, "The usefulness of state trade missions for the internationalization of firms: An econometric Analysis", The Hague Journal of Diplomacy, vol.10, no.2, pp.139-171, 2015-4-22, 2015
6. Cruza,SS, Teixeira,AA, "The magnitude of creative industries in Portugal: What do the distinct industry-based approaches tell us?", Creative Industries Journal, vol.8, no.1, pp.85-102, 2015-1-2, 2015

G.2. International conference proceedings with scientific referees

1. Barradas,LCS, Rodrigues,EM, Pinto Ferreira,JJ, "Supporting Collaborative Innovation Networks for New Concept Development Through Web Mashups", RISKS AND RESILIENCE OF COLLABORATIVE NETWORKS, vol.463, pp.357-365, 2015, 2015

G.3. Books (Author)

1. Teixeira,AAC, Pimenta,C, Maia,A, Moreira,JA, "Corruption, economic growth and globalization", Corruption, Economic Growth and Globalization, pp.1-266, 2015

G.4. Chapter/Paper in Books

1. Teixeira,AAC, "Corruption, economic growth and globalization: An introduction", Corruption, Economic Growth and Globalization, pp.1-10, 2015
2. Teixeira,AAC, Silva,ST, "Economic growth and the economics of corruption: A merge between tribes?", Corruption, Economic Growth and Globalization, pp.13-39, 2015
3. Monteiro,J, Santos,JD, Almeida,F, "The involvement of new ideas in products and services innovation: A technological approach", Handbook of Research on Effective Project Management through the Integration of Knowledge and Innovation, pp.159-176, 2015

G.5. Publications (Editor)

(Void)

G.6. Other Publications

1. Pacheco,AP, Claro,J, Fernandes,PM, de Neufville,R, Oliveira,TM, Borges,JG, Rodrigues,JC, "Cohesive fire management within an uncertain environment: A review of risk handling and decision support systems", FOREST ECOLOGY AND MANAGEMENT, vol.347, pp.1-17, JUL 1, 2015
2. Schell,KR, Claro,J, Fischbeck,P, "Geographic attribution of an electricity system renewable energy target: Local economic, social and environmental tradeoffs", RENEWABLE & SUSTAINABLE ENERGY REVIEWS, vol.50, pp.884-902, OCT, 2015

BIOMEDICAL ENGINEERING

A. DESCRIPTION OF THE RESEARCH CENTRE

The Center for Biomedical Engineering Research (CBER) represents the recognition from INESC TEC that Biomedical Engineering has been a growing area within the institution and is now mature enough to generate an autonomous research group. It is organized in three main Labs: BioInstrumentation, Biomedical Imaging and NeuroEngineering. Each lab is organized in Teams with specific research activities.

The Coordination of the RG will follow the general scheme at INESC TEC. It will be governed by a Coordinator and a Coordinating Council composed of 3 to 5 PhDs, having responsibilities over areas of work and research. The project leaders will respond to the Coordinating Council in what refers to the execution of projects and meeting financial sustainability goals as well as scientific productivity targets. This Coordinating Council will also suggest to the Direction of INESC TEC the form of the participation of C-BER in the Networked Intelligent Systems cluster coordination.

An administrative and secretarial support will be provided.

The BioInstrumentation Lab is organized in the following Teams:

Wearable Monitoring Systems

Embedded Visual Sensing

The Biomedical Imaging Lab is organized in the following Teams:

Retina CAD (CAD - Computer Aided Diagnosis)

Carotid CAD

Lung CAD

The NeuroEngineering Lab has four Teams:

NeuroImaging – Brain Imaging Technologies

NeuroMove – Movement Quantification in Neurological Diseases

NeuroStress – Stress and Fatigue Sensing Technologies

Brain-Computer Interfaces (BCI) – Neuro-interfaces

Researchers may belong to one or more labs and work with one or more Team. Labs and Teams have a physical meaning, i.e., a Lab exists with Teams inside. A Team may be in a Lab but also depend on cooperation with other labs or even other centers.

There are intra-center activities, namely on rehabilitation and inter-center research within the context of INESC-TEC. All this internal cooperation fosters an international networking, that is planned to expand the existing international contacts and cooperation of the members of the group, namely with the University of Utrecht, NL, and Carnegie Mellon University, USA, among others.

The three research labs of C-BER plan to expand and enhance their national and international contacts. In particular the computer-aided diagnosis methods and tools developed by the Biomedical Imaging Lab will be validated in a clinical context and further technological transfer of the products is foreseen, both at national and international levels. The NeuroEng Lab plans to foster and enhance research synergy across U.Porto medical and engineering groups involved in neurology related R&D at clinical and basic levels by developing neurotechnology projects. This will also involve other partners namely international R&D groups and industry. The Bioinstrumentation lab also seeks the technological transfer of tools and methods in continuation of previous practice and developed products already available in the market.

B. MAIN ACHIEVEMENTS

2015 was the second year of activity of C-BER. Naturally, it has an impact on the achievements herein reported, some of them being a result of activities developed in a different environment.

During 2015 the following important achievements can be highlighted in different areas of activity as in publications, in supervision, projects and others.

PATENTS

J. P. S. Cunha and P. M. Costa, "Wrist Rigidity Assessment Device for Use in Deep Brain Stimulation Surgery," Portugal Patent 20151000030856 (pending), 2015.

PUBLICATIONS

As reported in section G – List of Publications.

AWARDS

- Esteemed Paper for 2015 of journal Computers in Biology and Medicine, listed as top 5% in 2015, for the paper "Dashtbozorg, Ana Maria Mendonça, Aurelio Campilho, Optic Disc Segmentation Using the Sliding Band Filter, Computers in Biology and Medicine, vol. 56, pp 1-12, 2015."
- Nominated for the best paper award of poster "Tiago Freitas, Aurélio Campilho, An improved method for juxta-vascular nodule candidate detection, Recpad 2015 - 21st Edition of the Portuguese Conference on Pattern Recognition pp. 36-37, 2015. "
- 2nd position in the Grand Challenge in Digital Pathology, BioImaging 2015 for the system developed by Eduardo Castro, Guilherme Aresta, Teresa Araújo, José Rouco, Aurélio Campilho, Breast Cancer Histology Images Classification using Convolutional Neural Networks, Bioimaging 2015.

PROJECTS

- SCREEN-DR: Image Analysis and Machine Learning Platform for Innovation in Diabetic Retinopathy Screening, CMUP-ERI/TIC/0028/2014, April 2016 – March 2020, (552.044 Euros). (Aurélio Campilho Principal Investigator).
- LNDetector - Automatic Detection, Segmentation and Classification of Pulmonary Nodules System in Computed Tomography Images, PTDC/EEI-SII/6599/2014, Jan 2016 – Dec 2018 (198.189 Euros). (Aurélio Campilho Principal Investigator).
- Analisis Automatico de Imagenes De Retina y Carotida: Correlacion Entre Microcirculacion Retiniana y Macrocirculacion Cerebro-Vascular, TIN2011-25476, 01/01/2012-31/12/2014 (76 KEuros), with University of Coruña, Spain
- NanoSTIMA - Macro-to-Nano Human Sensing: Towards Integrated Multimodal Health Monitoring and Analytic, NORTE-01-0145-FEDER-000016 – Coordinator of Research Line 1 – Macro-to-Nano Human Sensing Technologies (2015-2018) 1,260,765.70 € (Aurélio Campilho Coordinator of Research Line 5.).

POST-DOCTORAL

Phd Supervision

- Title: “Automatic characterization of atherosclerotic plaque in ultrasound images”, Bolsa de pós-doutoramento da FCT, contrato SFRH/BPD/79154/2011. Researcher: José Rouco Maseda, Starting date: 1-Jan-2012; End date: 31-Dec-2017
- Title: “Measurement of vascular biomarkers in retinal images”, Bolsa de pós-doutoramento do INESC TEC. Researcher: Beatriz Remeseiro López (Spain), Position: Post-doctoral grant, Dates: May 1, 2015; Dec 31, 2015

Ph.D. Theses – Concluded

Antonio José Salazar Escobar, Mixed-signal Test and Measurement Framework for Wearable Monitoring System, Ph.D. in Electrical and Computer Engineering, 2015. Supervisor: Miguel Velhote Correia.

Maria João Medeiros de Vasconcelos, Computational algorithms for image analysis: Applications on human vocal tract and silhouette, Programa Doutoral em Engenharia Informática, 2015. Co-supervisor: Miguel Velhote Correia.

Behdad Dashtbozorg, Advanced Image Analysis for the Assessment of Retinal Vascular Changes, Ph.D. in Electrical and Computer Engineering, 2015. Supervisor: Ana Maria Mendonça, Co-supervisor: Aurélio Campilho.

Ph.D. Theses – under development

- Daniela Marisa da Silva Campos, “Lung nodule characterization and follow-up assessment”, FEUP. Supervisors: Aurélio Campilho, Ana Maria Mendonça.
- José Ricardo Ferreira de Castro Ramos, “Content based image retrieval as a computer aided diagnosis tool for radiologists”, FEUP. Supervisors: Aurélio Campilho.
- Maria do Carmo Vilas-Boas, “Motor impairment assessment in TTR Familial Amyloid Polyneuropathy”, FEUP. Supervisor: João Paulo Cunha
- Dustin Axman, “Stress and Fatigue detection in Hazardous Professionals”, CMU/FEUP (CMU-Portugal), Supervisors: João Paulo Cunha (FEUP) / Fernando de La Torre (CMU)

OTHER

Aurélio Campilho is Associate Editor of the Machine Vision and Applications Elsevier Journal and is a member of Editorial Advisory Board of JTACS - Journal of Theoretical and Applied Computer Science, Polish Academy of Science. <http://www.jtacs.org/sciboard>.

Aurélio Campilho was chair and editor of the book of abstracts of the DCE 2015 - Doctoral Congress in Engineering, Doctoral Symposium in Electrical and Computer Engineering, FEUP, 2015.

João Paulo Cunha was member of the external evaluation committee for the Biomedical Engineering area of the National Agency for Higher Education Accreditation (A3ES) that evaluated most of the degrees in the area in Portugal.

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes			12	117	178	52%
European Union Programmes						
R&D Services and Consulting				18	38	111%
Other R&D sources				15	17	13%
Other external sources						
Total			12	150	233	55%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	4	36%	126	54%
	National Programmes - QREN	1	9%	52	22%
	National Programmes – P2020				
	National Programmes - PICT	3	27%		
	European Union Programmes – FP7				
	European Union Programmes – H2020				
	European Union Programmes - Other				
	R&D Services and Consulting - National	2	18%	38	16%
	R&D Services and Consulting – European Union				
	R&D Services and Consulting - International				
	Other R&D sources	1	9%	17	7%
	Other external sources				
	Internal				
Dominant Activity type	Basic Research	9	82%	195	84%
	Applied Research and Development	2	18%	38	16%
	Consulting				
	Technology Transfer				
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	4	36%	20	9%
	Continuation	1	9%	37	16%
	Started and Concluded within the year				
	Concluded	6	55%	176	76%
Total		11		233	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year				
	2010	2011	2012	2013	2014
Papers in International Journals with scientific referees				2	11
International Conference Proceedings with scientific referees				5	22
Books - Author					1
Chapter in books				1	2
Publications (Editor)					3
Other Publications					4
Total				8	43

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	22
Doctoral	3
Total	25

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
VitalResponder2	João Paulo Cunha	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2013-07	FIN
ASD-MD	João Paulo Cunha	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PAR	2013-07	FIN
STePMotion	Sandra Silva Mouta	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2014-04	FIN
VR2Market	João Paulo Cunha	RES	PROG - NAT	FCT	PROJ CMU	INT	PROP	2014-07	CONT
HERMES	João Paulo Cunha	RES	PROG - NAT	POFC	PROJ CO-PROM	NAT	PAR	2013-07	FIN
SMILES-1	João Paulo Cunha	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START
EcoDrive	João Paulo Cunha	DEV	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2014-04	FIN
Bio-Early	João Paulo Cunha	DEV	SERV - NAT				CONT	2015-03	START
Re-Learning	Sandra Silva Mouta	RES	ORD				CONT	2014-01	FIN

Dominant Activity Type:

RES – Research
DEV – Development
CONS - Consulting
TT - Technology Transfer
NET - Network
CONF - Conference
TRAIN - Advanced Training
INC - Incubation
O - Other

Source:

PROG – NAT – National Programmes
PROG – EU – European Union Programmes
SERV - NAT - Supply of Services - national
SERV - EU - Supply of Services - European Union
SERV - INT - Supply of Services - International
ORD - Other R&D Services
O - Other External Services
INT - Internal

Type:

IND – Individual Project
NAT - National Cooperation
EU - European Union Cooperation (EU+Associated Countries)
INT - Internal Cooperation

Role INESCP:

PROP - Proponent
PAR - Partner
CONT - Prime Contractor
SUB - Subcontractor
MEMB - Membre
O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

- Martins,M, Cunha,A, Oliveira,I, Morgado,L, "Usability test of 3Dconnexion 3D mice versus keyboard plus mouse in Second Life undertaken by people with motor disabilities due to medullary lesions", UNIVERSAL ACCESS IN THE INFORMATION SOCIETY, vol.14, no.1, pp.5-16, MAR, 2015
- Faria,C, Silva,J, Campilho,A, "Rehab@home: A tool for home-based motor function rehabilitation", Disability and Rehabilitation: Assistive Technology, vol.10, no.1, pp.67-74, 2015-1, 2015
- Dashtbozorg,B, Mendonca,AM, Campilho,A, "Optic disc segmentation using the sliding band filter", COMPUTERS IN BIOLOGY AND MEDICINE, vol.56, pp.1-12, JAN 1, 2015
- Remeseiro,B, Oliver,KM, Tomlinson,A, Martin,E, Barreira,N, Mosquera,A, "Automatic grading system for human tear films", Pattern Analysis and Applications, vol.18, no.3, pp.677-694, 2015-07-15, 2015
- Remeseiro,B, Mosquera,A, Gonzalez Penedo,M, "CASDES: a computer-aided system to support dry eye diagnosis based on tear film maps", IEEE Journal of Biomedical and Health Informatics - IEEE J. Biomed. Health Inform., pp.1-1, 2015, 2015
- Rodrigues,JGP, Kaiseler,M, Aguiar,A, Silva Cunha,JPS, Barros,J, "A Mobile Sensing Approach to Stress Detection and Memory Activation for Public Bus Drivers", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.16, no.6, pp.3294-3303, DEC, 2015

7. Canedo,VB, Remeseiro,B, Maroño,NS, Betanzos,AA, "Real-Time Tear Film Classification Through Cost-Based Feature Selection", Transactions on Computational Collective Intelligence XX, vol.20, pp.78-98, 2015, 2015

G.2. International Conference proceedings with scientific referees

1. Remeseiro,B, Fernandez,A, Lira,M, "Automatic Eye Blink Detection Using Consumer Web Cameras", ADVANCES IN COMPUTATIONAL INTELLIGENCE, PT II, vol.9095, pp.103-114, 2015-06-09, 2015
2. Da Silva,NM, Rozanski,VE, Cunha,JPS, "A 3D multimodal approach to precisely locate DBS electrodes in the basal ganglia brain region", International IEEE/EMBS Conference on Neural Engineering, NER, vol.2015-July, pp.292-295, 2015-4, 2015
3. Novo,J, Goncalves,L, Mendonca,AM, Campilho,A, "3D lung nodule candidate detection in multiple scales", Proceedings of the 14th IAPR International Conference on Machine Vision Applications, MVA 2015, pp.61-64, 2015-07-14, 2015
4. González López,A, Remeseiro,B, Ortega,M, Penedo,MG, "Choroid characterization in EDI OCT retinal images based on texture analysis", ICAART 2015 - 7th International Conference on Agents and Artificial Intelligence, Proceedings, vol.2, pp.269-276, 2015, 2015
5. Araujo,T, Aresta,G, Rouco,J, Ferreira,C, Azevedo,E, Campilho,A, "Optical Flow Based Approach for Automatic Cardiac Cycle Estimation in Ultrasound Images of the Carotid", IMAGE ANALYSIS AND RECOGNITION (ICIAR 2015), vol.9164, pp.360-367, 2015, 2015
6. Dashtbozorg,B, Mendonca,AM, Campilho,A, "Assessment of Retinal Vascular Changes Through Arteriolar-to-Venular Ratio Calculation", IMAGE ANALYSIS AND RECOGNITION (ICIAR 2015), vol.9164, pp.335-343, 2015-07-06, 2015
7. González López,A, Remeseiro,B, Ortega,M, Penedo,MG, Charlón,P, "A texture-based method for choroid segmentation in retinal EDI-OCT images", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9520, pp.487-493, 2015, 2015
8. Pinto Silva,PMP, Silva Cunha,JPS, "SenseMyHeart: A Cloud Service and API for Wearable Heart Monitors", 2015 37TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC), vol.2015-November, pp.4986-4989, 2015-8, 2015
9. Costa,P, Rosas,MJ, Vaz,R, Cunha,JP, "Wrist Rigidity Assessment During Deep Brain Stimulation Surgery", 2015 37TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC), vol.2015-November, pp.3423-3426, 2015-8, 2015
10. Moreira,HT, Silva,IM, Sousa,M, Sampaio,P, Silva Cunha,JPS, "Neurotransmitter Vesicle Movement Dynamics in Living Neurons", 2015 37TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC), vol.2015-November, pp.6265-6268, 2015-8, 2015
11. Borges,DM, Cunha,JP, "Telemedicine multimedia system to support Neurodegenerative diseases participatory management", 2015 37TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC), vol.2015-November, pp.4982-4985, 2015-8, 2015
12. Rocha,AP, Choupina,H, Fernandes,JM, Rosas,MJ, Vaz,R, Silva Cunha,JPS, "Kinect v2 Based System for Parkinson's Disease Assessment", 2015 37TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC), vol.2015-November, pp.1279-1282, 2015-8, 2015

G.3. Books (Author)

1. Kamel,M, Campilho,A, "Image Analysis and Recognition", Lecture Notes in Computer Science, 2015, 2015

G.4. Chapter/Paper in Books

(Void)

G.5. Publications (Editor)

1. Kamel,M, Campilho,AJC, "Image Analysis and Recognition - 12th International Conference, ICIAR 2015, Niagara Falls, ON, Canada, July 22-24, 2015, Proceedings", ICIAR, vol.9164, 2015-07-06, 2015

G.6. Other Publications

1. Ferreira,C, Castro,P, Penas,S, Monteiro,A, Martins,L, Campilho,A, Azevedo,E, Polonia,J, "Better stroke preventive effect of calcium channel blockers is not explained by its effect in macro and microvascular disease markers", INTERNATIONAL JOURNAL OF STROKE, vol.10, pp.99-99, APR, 2015
2. Castro,P, Monteiro,A, Penas,S, Ferreira,C, Martins,L, Campilho,A, Polonia,J, Azevedo,E, "Carotid intima-medial thickness, aortic stiffness and retinal microvascular signs provide evidence for optimal blood pressure target in hypertensive patients", INTERNATIONAL JOURNAL OF STROKE, vol.10, pp.100-101, APR, 2015
3. Monteiro,A, Castro,P, Penas,S, Ferreira,C, Martins,L, Campilho,A, Azevedo,E, Polonia,J, "Relationship between blood pressure control and arterial stiffness, carotid artery and retinal damage in hypertensive patients with and without type 2 diabetes mellitus", INTERNATIONAL JOURNAL OF STROKE, vol.10, pp.233-233, APR, 2015

ARTIFICIAL INTELLIGENCE AND DECISION SUPPORT

A. DESCRIPTION OF THE RESEARCH CENTRE

LIAAD's aggregating focus is decision support, data science and decision modeling. Current scientific lines are organized in three main divisions:

- Data Mining (including mostly machine learning and artificial intelligence approaches);
- Data Analysis and Statistical Methods;
- Modeling and Optimization (including operations research, mathematical modeling and artificial intelligence approaches).

Within INESC TEC, LIAAD has a horizontal range of skills that are useful for the development of application and research projects in different areas of application. Starting collaborations are often done through the coordinator, who matches the right skills within LIAAD with the required needs for each project. LIAAD increasingly benefits from the support of the industrial liaison service SAPE.

LIAAD has one secretary, dedicated 50% and one scientific manager(50%). For technical support, LIAAD uses a part-time collaborator who articulates with the software support service SAS.

LIAAD's research lines can be summarized as "Intelligent and Adaptive Systems and Mathematical Modeling in Decision Support".

LIAAD's aims are to produce high quality cutting-edge research, to be in the international forefront of our research areas and promote transfer of knowledge and technology. LIAAD is in the very strategic area of Data Science. The huge amounts of collected data (Big Data) and the ubiquity of devices with sensors and/or processing power offer opportunities and challenges to scientists and engineers. On the other hand, the demand for complex models for objective decision support is spreading in business, health, science, e-government and e-learning, reinforcing our investment in different approaches to modeling. Our overall strategy is to take advantage of the data flood and data diversification and invest in research lines that will help shorten the gap between collected data and useful data, as well as offering diverse modeling solutions.

The lines of work related to Data Science that we will continue addressing in the near future are:

- Data streams: allow the treatment of continuous and voluminous streams of data generated by sensors or other sources;
- Temporal and Spatial data analysis: the ubiquitous and permanent data collection implies awareness of time and space; new algorithms are needed for prediction and monitoring of unusual events within spatio-temporal context converting predictions into useful decisions in subsequent decision making steps;
- Web, Text and Media data analysis: the growth of the size and importance of the web and social networks, and the increasing variety of contents require increasing data analysis capabilities of huge and complex data that enable powerful applications (including: sentiment analysis, information retrieval, recommender systems, social network analysis);
- Complex data analysis: data comes in varied and new formats, containing more and more information, from domains ranging from genetics to urban mobility (including ILP, symbolic data analysis, network data, data fusion, variable selection and grouping, active learning);
- Meta learning: the growing dynamics of data requires systems that are self-aware and capable of adapting to new problems with little human intervention.

The lines in Modeling are:

- Simulation and optimization: focusing on solutions for decision problems in management science and other application areas; Exploiting meta-heuristics and optimization techniques based on genetic algorithms, ant colony systems, among others; methods using AI-based approaches, such as multi-agent framework, that enable the simulation of the society or the economy and the interplay between their agents;
- Mathematical modeling focusing on dynamical systems and game theory: applicable to mathematical physics, mathematical biology, time series analysis, mathematical economy and finances and models of industrial organization.

B. MAIN ACHIEVEMENTS

In 2015 the group had a high number of publications (45) in international journals. We also counted 27 articles in highly ranked conferences (CORE $\geq$ B or indexed in ISI or SCOPUS), including IJCNN, IDA and SAC. Overall the group published more than 100 articles in journals, conferences and books. Researchers from the group have participated in the organization of many international conferences, as organization committee members, track chairs, area chairs and program committee members. 9 new books and 5 special issues of journals were released with collections of articles. 7 PhD theses and 44 MSc dissertations with supervision or co-supervision of LIAAD members were concluded and defended last year. Many of our researchers participate as members of editorial boards of scientific journals and scientific committees of international conferences.

Two LIAAD members were the Conference chairs of ECML/PKDD 2015, the main European conference on Machine Learning and Data Mining with more than 600 participants. Other LIAAD members participated in different roles of the organization. Other events organized: Artificial Economics 2015, FEP, Porto, 3 to 4 September, 2015, <http://ae2015.inescporto.pt/> and various workshops and special tracks in international conferences.

LIAAD cooperated in projects with CEGI, CESE, CPES, ROBIS and CRACS.

Some books and articles authored by LIAAD researchers have a very high number of citations: the book "Knowledge discovery from data streams" by João Gama (2010) reached 442 citations by the end of 2015 (source Google Scholar). "Data Mining with R, learning with case studies" by Luís Torgo (2010) has reached 184 citations, 49 of which in 2015 only (source Google Scholar). One single article by José Fernando Gonçalves reached 517 citations, 52 of which in 2015 (source Google Scholar).

Papers were published in high impact journals such as Human Mutation (IF: 5.144), Information Sciences (3.242), Obesity Surgery (3.747).

Alberto Pinto is editor-in-chief of the Journal of Dynamics and Games published by the American Institute of Mathematical Sciences. We had special issues in the Machine Learning Journal, Data Mining and Knowledge Discovery and Information Processing and management, among others.

Software was made available to the community: AMRULES is available in MOA and SAMOA; the R package "performanceEstimation" for performance estimation and comparison of predictive models.

We had a knowledge transfer contract with an important Portuguese book publishing company and another on a Business Intelligence solution for the University of Porto. We participated in one H2020 project.

Elements of LIAAD continue to have prominent roles in scientific societies: Paula Brito as president of IASC, International Association for Statistical Computing; Alberto Pinto is President of the International Center of Mathematics CIM, Portugal.

The Center established large cooperation with other Centers through projects and proposal submission as well as participation in other cross-center activities. This is reported in the Research Lines report sections.

As main results of the cooperation of this research group with other competences we highlight:

CRACS - joint project for knowledge transfer;

CESE – an upgrade of a business intelligence solution has been deployed at Universidade do Porto; joint papers published; joint supervision of students;

CEGI - joint papers published.

CPES - co-supervision of an MSc dissertation.

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	71	50	15	42	53	26%
European Union Programmes	7	40	61	193	41	-79%
R&D Services and Consulting	4	5	8	25	73	192%
Other R&D sources						
Other external sources				7	65	829%
Total	82	95	84	267	232	-13%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	2	12%	1	0%
	National Programmes - QREN				
	National Programmes – P2020				
	National Programmes - PICT	9	53%	52	22%
	European Union Programmes – FP7	1	6%	41	18%
	European Union Programmes – H2020				
	European Union Programmes - Other	1	6%		
	R&D Services and Consulting - National	2	12%	73	31%
	R&D Services and Consulting – European Union				
	R&D Services and Consulting - International	1	6%		
	Other R&D sources				
	Other external sources	1	6%	65	28%
	Internal				
Dominant Activity type	Basic Research	13	76%	94	41%
	Applied Research and Development	2	12%	21	9%
	Consulting	1	6%	52	22%
	Technology Transfer				
	Network				
	Conference	1	6%	65	28%
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	9	53%	52	22%
	Continuation	3	18%	127	55%
	Started and Concluded within the year				
	Concluded	5	29%	53	23%
Total		17		232	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	23	40	43	40	34	48
International Conference Proceedings with scientific referees	57	72	60	44	66	39
Books - Author	3	1	1			3
Chapter in books	12	5	4	4	12	3
Publications (Editor)	3	4	1	3	1	5
Other Publications			50	4	9	6
Total	98	122	159	95	122	104

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	57
Doctoral	7
Total	64

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
Dynamics	Alberto Pinto	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2012-03	FIN
MAESTRA	João Gama	RES	PROG - EU	FP7		EU	PAR	2014-02	CONT
SEA	Alípio Jorge	CONS	SERV - NAT				CONT	2015-01	START
ECML/ PKDD	João Gama	CONF	O			INT	PROP	2014-07	CONT
Dynamics	Alberto Pinto	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2012-03	FIN

Dominant Activity Type:

RES – Research
DEV – Development
CONS - Consulting
TT - Technology Transfer
NET - Network
CONF - Conference
TRAIN - Advanced Training
INC - Incubation
O - Other

Source:

PROG – NAT – National Programmes
PROG – EU – European Union Programmes
SERV - NAT - Supply of Services - National
SERV - EU - Supply of Services - European Union
SERV - INT - Supply of Services - International
ORD - Other R&D Services
O - Other External Services
INT - Internal

Type:

IND – Individual Project
NAT - National Cooperation
EU - European Union Cooperation
(EU+Associated Countries)
INT - Internal Cooperation

Role INESCP:

PROP - Proponent
PAR - Partner
CONT - Prime Contractor
SUB - Subcontractor
MEMB - Member
O – Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Ferreira,FA, Ferreira,F, Ferreira,M, Pinto,AA, "Flexibility in a Stackelberg leadership with differentiated goods", OPTIMIZATION, vol.64, no.4, pp.877-893, APR 3, 2015
2. Campos,R, Dias,G, Jorge,AM, Jatowt,A, "Survey of Temporal Information Retrieval and Related Applications", ACM COMPUTING SURVEYS, vol.47, no.2, pp.15, JAN, 2015
3. Poinhos,R, Alves,D, Vieira,E, Pinhao,S, Oliveira,BMPM, Correia,F, "Eating behaviour among undergraduate students. Comparing nutrition students with other courses", APPETITE, vol.84, pp.28-33, JAN 1, 2015
4. Brito,PQ, Pratas,J, "Tourism brochures: Linking message strategies, tactics and brand destination attributes", TOURISM MANAGEMENT, vol.48, pp.123-138, JUN, 2015
5. Mendes Moreira,J, Moreira Matias,L, Gama,J, de Sousa,JF, "Validating the coverage of bus schedules: A Machine Learning approach", INFORMATION SCIENCES, vol.293, pp.299-313, FEB 1, 2015
6. Rambocas,M, Meneses,R, Monteiro,C, Brito,PQ, "Direct or indirect channel structures. Evaluating the impact of channel governance structure on export performance", INTERNATIONAL BUSINESS REVIEW, vol.24, no.1, pp.124-132, FEB, 2015
7. Mendes Moreira,J, Jorge,AM, de Sousa,JF, Soares,C, "Improving the accuracy of long-term travel time prediction using heterogeneous ensembles", NEUROCOMPUTING, vol.150, no.PB, pp.428-439, FEB 20, 2015
8. Ikononovska,E, Gama,J, Dzeroski,S, "Online tree-based ensembles and option trees for regression on evolving data streams", NEUROCOMPUTING, vol.150, no.PB, pp.458-470, FEB 20, 2015

9. Santos,DM, Rodrigues,SSP, Oliveira,BMPM, de Almeida,MDV, "Dietary availability in elderly Portuguese households", PUBLIC HEALTH NUTRITION, vol.18, no.3, pp.392-402, FEB, 2015
10. Poinhos,R, Oliveira,BMPM, Correia,F, "Eating behavior in Portuguese higher education students: The effect of social desirability", NUTRITION, vol.31, no.2, pp.310-314, FEB, 2015
11. Monteiro,MSR, Fontes,DBMM, Fontes,FACC, "The hop-constrained minimum cost flow spanning tree problem with nonlinear costs: an ant colony optimization approach", OPTIMIZATION LETTERS, vol.9, no.3, pp.451-464, MAR, 2015
12. Brito,P, Pedro Duarte Silva,APD, Dias,JG, "Probabilistic clustering of interval data", INTELLIGENT DATA ANALYSIS, vol.19, no.2, pp.293-313, 2015-04-19, 2015
13. Dias,S, Brito,P, "Linear regression model with histogram-valued variables", Statistical Analysis and Data Mining, vol.8, no.2, pp.75-113, 2015-05-18, 2015
14. Fernandez Garcia,MP, Teixeira,JM, Machado,P, Oliveira,MRFF, Maia,JM, Pereira,C, Pereira,AM, Freire,C, Araujo,JP, "Automatized and desktop AC-susceptometer for the in situ and real time monitoring of magnetic nanoparticles' synthesis by coprecipitation", REVIEW OF SCIENTIFIC INSTRUMENTS, vol.86, no.4, pp.043904, APR, 2015
15. Kosina,P, Gama,J, "Very fast decision rules for classification in data streams", DATA MINING AND KNOWLEDGE DISCOVERY, vol.29, no.1, pp.168-202, JAN, 2015
16. de Araujo Burgos,MGPD, Cabral,PC, Maio,R, Oliveira,BMPM, Oliveira Dias,MSO, de Figueiredo Melim,DBD, Correia,MF, "Prevalence of Alcohol Abuse Before and After Bariatric Surgery Associated With Nutritional and Lifestyle Factors: A Study Involving a Portuguese Population", OBESITY SURGERY, vol.25, no.9, pp.1716-1722, SEP, 2015
17. Morte,R, Pereira,T, Fontes,DBMM, "MCDA applied to performance appraisal of short-haul truck drivers: A case study in a Portuguese trucking company", International Journal for Quality Research, vol.9, no.1, pp.65-76, 2015
18. Goncalves,JF, Resende,MGC, "A biased random-key genetic algorithm for the unequal area facility layout problem", EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, vol.246, no.1, pp.86-107, OCT 1, 2015
19. Vinagre,J, Jorge,AM, Gama,J, "Evaluation of recommender systems in streaming environments", CoRR, vol.abs/1504.08175, 2015-05-02, 2015
20. Fanaee T,H, Gama,J, "EigenEvent: An algorithm for event detection from complex data streams in syndromic surveillance", INTELLIGENT DATA ANALYSIS, vol.19, no.3, pp.597-616, 2015-6-9, 2015
21. Fanaee T,H, Gama,J, "Eigenspace method for spatiotemporal hotspot detection", EXPERT SYSTEMS, vol.32, no.3, pp.454-464, JUN, 2015
22. Saez,C, Rodrigues,P, Gama,J, Robles,M, Garcia Gomez,JM, "Probabilistic change detection and visualization methods for the assessment of temporal stability in biomedical data quality", DATA MINING AND KNOWLEDGE DISCOVERY, vol.29, no.4, pp.950-975, JUL, 2015
23. Branco,P, Torgo,L, Ribeiro,RP, "A Survey of Predictive Modelling under Imbalanced Distributions", CoRR, vol.abs/1505.01658, 2015-06-01, 2015
24. Torgo,L, Branco,P, Ribeiro,RP, Pfahringer,B, "Resampling strategies for regression", EXPERT SYSTEMS, vol.32, no.3, pp.465-476, JUN, 2015
25. Valizadeh,M, Brazdil,P, "Density-based graph model summarization: Attaining better performance and efficiency", INTELLIGENT DATA ANALYSIS, vol.19, no.3, pp.617-629, 2015-11-03, 2015
26. Brito,PQ, Soares,C, Almeida,S, Monte,A, Byvoet,M, "Customer segmentation in a large database of an online customized fashion business", ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING, vol.36, pp.93-100, DEC, 2015

27. Figueiredo,A, Gomes,P, "Clustering of Variables Based on Watson Distribution on Hypersphere: A Comparison of Algorithms", COMMUNICATIONS IN STATISTICS-SIMULATION AND COMPUTATION, vol.44, no.10, pp.2622-2635, 2014-4-7, 2015
28. Oliveira,BMPM, Figueiredo,IP, Burroughs,NJ, Pinto,AA, "Approximate equilibria for a T cell and treg model", Applied Mathematics and Information Sciences, vol.9, no.5, pp.2221-2231, 2015
29. Moreira Matias,L, Mendes Moreira,J, de Sousa,JF, Gama,J, "Improving Mass Transit Operations by Using AVL-Based Systems: A Survey", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.16, no.4, pp.1636-1653, AUG, 2015
30. Moniz,N, Torgo,L, "Socially Driven News Recommendation", CoRR, vol.abs/1506.01743, 2015-07-01, 2015
31. Valeria Uriarte Arcia,AV, Lopez Yanez,I, Yanez Marquez,C, Gama,J, Camacho Nieto,O, "Data Stream Classification Based on the Gamma Classifier", MATHEMATICAL PROBLEMS IN ENGINEERING, vol.2015, pp.1-17, 2015, 2015
32. Pinto,AA, Parreira,T, "Price competition in the Hotelling model with uncertainty on costs", OPTIMIZATION, vol.64, no.11, pp.2477-2493, NOV 2, 2015
33. Teles,P, Brito,P, "Modeling Interval Time Series with Space-Time Processes", COMMUNICATIONS IN STATISTICS-THEORY AND METHODS, vol.44, no.17, pp.3599-3627, 2013-4, 2015
34. Valizadeh,M, Brazdil,P, "Exploring actor-object relationships for query-focused multi-document summarization", SOFT COMPUTING, vol.19, no.11, pp.3109-3121, NOV, 2015
35. Cavadas,B, Soares,P, Camacho,R, Brandao,A, Costa,MD, Fernandes,V, Pereira,JB, Rito,T, Samuels,DC, Pereira,L, "Fine Time Scaling of Purifying Selection on Human Nonsynonymous mtDNA Mutations Based on the Worldwide Population Tree and Mother-Child Pairs", HUMAN MUTATION, vol.36, no.11, pp.1100-1111, NOV, 2015
36. Hora,J, Campos,P, "A review of performance criteria to validate simulation models", EXPERT SYSTEMS, vol.32, no.5, pp.578-595, OCT, 2015
37. Fanaee T,H, Gama,J, "Multi-aspect-streaming tensor analysis", Knowledge-Based Systems, vol.89, pp.332-345, 2015-11, 2015
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43. Garrido,P, Campos,P, Dias,A, "BALANCE SHEET ANALYSIS OF CREDIT AND DEBT NETWORKS", ADVANCES IN COMPLEX SYSTEMS, vol.18, no.5-6, AUG-SEP, 2015
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45. Campos,A, Costa,J, Lopes,JT, Louçã,F, Moniz,N, "Representatives and dominants: Rulers and class relations in Portugal [Representantes e dominantes: Os governantes e as relações de classe em Portugal]", Revista Critica de Ciencias Sociais, no.108, pp.55-74, 2015-12-1, 2015
46. Moniz,N, Campos,A, "Relational Data on Members of Portuguese Governments (1976?2014)", Data, vol.1, no.1, pp.1-8, 2015-8-24, 2015
47. Pinto,AA, Mousa,A, Soeiro,R, "Externality effects in the formation of societies", JDG - Journal of Dynamics and Games, vol.2, no.3/4, pp.303-320, 2015-11, 2015
48. Ferreira,CA, Gama,J, Costa,VS, "Exploring multi-relational temporal databases with a propositional sequence miner", Progress in AI, vol.4, no.1-2, pp.11-20, 2015-11-27, 2015

G.2. International Conference Proceedings with scientific referees

1. Gama,J, "Challenges in Learning from Streaming Data Extended Abstract", Advances in Intelligent Systems and Computing, vol.311, pp.1-5, 2015, 2015
2. Vu,AT, De Francisci Morales,G, Gama,J, Bifet,A, "Distributed Adaptive Model Rules for mining big data streams", Proceedings - 2014 IEEE International Conference on Big Data, IEEE Big Data 2014, pp.345-353, 2015-01-13, 2015
3. Pinto,F, Soares,C, Mendes Moreira,J, "Pruning bagging ensembles with metalearning", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9132, pp.64-75, 2015-06-03, 2015
4. Sarmento,R, Cordeiro,M, Gama,J, "Visualization for streaming telecommunications networks", Lecture Notes in Artificial Intelligence (Subseries of Lecture Notes in Computer Science), vol.8983, pp.117-131, 2015-05-06, 2015
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6. Rodrigues,PP, Santos,DF, Leite,L, "Obstructive Sleep Apnea diagnosis: the Bayesian network model revisited", 2015 IEEE 28TH INTERNATIONAL SYMPOSIUM ON COMPUTER-BASED MEDICAL SYSTEMS (CBMS), vol.2015-July, pp.115-120, 2015-07-29, 2015
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8. Sarmento,R, Cordeiro,M, Gama,J, "Streaming networks sampling using top-K networks", ICEIS 2015 - 17th International Conference on Enterprise Information Systems, Proceedings, vol.1, pp.228-234, 2015, 2015
9. Cerqueira,V, Oliveira,M, Gama,J, "A framework for analysing dynamic communities in large-scale social networks", ICEIS 2015 - 17th International Conference on Enterprise Information Systems, Proceedings, vol.1, pp.235-242, 2015, 2015
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11. Matuszyk,P, Vinagre,J, Spiliopoulou,M, Jorge,AM, Gama,J, "Forgetting methods for incremental matrix factorization in recommender systems", Proceedings of the ACM Symposium on Applied Computing, vol.13-17-April-2015, pp.947-953, 2015, 2015
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13. Félix,C, Soares,C, Jorge,A, "Metalearning for multiple-domain transfer learning", CEUR Workshop Proceedings, vol.1455, pp.67-79, 2015-10-06, 2015
14. Abdulrahman,SM, Brazdil,P, Van Rijn,JN, Vanschoren,J, "Algorithm selection via meta-learning and sample-based active testing", CEUR Workshop Proceedings, vol.1455, pp.55-66, 2015
15. Rodrigues,AV, Jorge,A, Dutra,I, "Accelerating recommender systems using GPUs", Proceedings of the ACM Symposium on Applied Computing, vol.13-17-April-2015, pp.879-884, 2015, 2015
16. Nabizadeh,AH, Jorge,AM, Leal,JP, "Long term goal oriented recommender systems", WEBIST 2015 - 11th International Conference on Web Information Systems and Technologies, Proceedings, pp.552-557, 2015-08-03, 2015
17. Silva,AM, Ribeiro,RP, Gama,J, "An Experimental Study on Predictive Models Using Hierarchical Time Series", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.501-512, 2015-08-26, 2015
18. Cardoso,DO, França,F, Gama,J, "A bounded neural network for open set recognition", Proceedings of the International Joint Conference on Neural Networks, vol.2015-September, pp.1-7, 2015-10-08, 2015
19. Sarmento,R, Cordeiro,M, Gama,J, "Visualization of evolving large scale Ego-Networks", Proceedings of the ACM Symposium on Applied Computing, vol.13-17-April-2015, pp.960-962, 2015-07-21, 2015
20. Nezvalová,L, Popelínský,L, Torgo,L, Vaculík,K, "Class-based outlier detection: Staying zombies or awaiting for resurrection?", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9385, pp.193-204, 2015-10-13, 2015
21. van Rijn,JN, Abdulrahman,SM, Brazdil,P, Vanschoren,J, "Fast algorithm selection using learning curves", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9385, pp.298-309, 2015-10-13, 2015
22. Pinto,D, Costa,P, Camacho,R, Costa,VS, "Predicting Drugs Adverse Side-Effects Using a Recommender-System", DISCOVERY SCIENCE, DS 2015, vol.9356, pp.201-208, 2015-10-05, 2015
23. Cordeiro,J, Inacio,PRM, Fernandes,DAB, "Fractal Beauty in Text", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.796-802, 2015, 2015
24. Cavadas,B, Branco,P, Pereira,S, "Crime Prediction Using Regression and Resources Optimization", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.513-524, 2015, 2015
25. Fernandes,R, Campos,P, Rita Gaio,AR, "An Agent-Based MicMac Model for Forecasting of the Portuguese Population", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.702-707, 2015, 2015
26. Baia,L, Torgo,L, "Forecasting the Correct Trading Actions", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.560-571, 2015, 2015
27. Fontes,DBMM, Gonçalves,JF, "A genetic algorithm for scheduling alternative tasks subject to technical failure", Springer Proceedings in Mathematics and Statistics, vol.130, pp.139-152, 2015, 2015
28. Gonçalves,JF, "A hybrid biased random key genetic algorithm for a production and cutting problem", IFAC Proceedings Volumes (IFAC-PapersOnline), vol.48, no.3, pp.496-500, 2015, 2015
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30. Trigo,L, Víta,M, Sarmento,R, Brazdil,P, "Retrieval, visualization and validation of affinities between documents", IC3K 2015 - Proceedings of the 7th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management, vol.3, pp.452-459, 2015, 2015
31. Duarte,J, Gama,J, "Multi-target regression from high-speed data streams with adaptive model rules", Proceedings of the 2015 IEEE International Conference on Data Science and Advanced Analytics, DSAA 2015, pp.1-10, 2015-10, 2015

32. Gama,J, "Keynote speaker 2: Real time data mining", 2015 IEEE International Conference on Evolving and Adaptive Intelligent Systems, EAIS 2015, Douai, France, December 1-3, 2015, pp.1, 2015-12, 2015
33. Souza,VMAd, Silva,DF, Batista,GEAPA, Gama,J, "Classification of Evolving Data Streams with Infinitely Delayed Labels", 14th IEEE International Conference on Machine Learning and Applications, ICMLA 2015, Miami, FL, USA, December 9-11, 2015, pp.214-219, 2015-12, 2015
34. Sakamoto,Y, Fukui,Ki, Gama,J, Nicklas,D, Moriyama,K, Numao,M, "Concept Drift Detection with Clustering via Statistical Change Detection Methods", 2015 Seventh International Conference on Knowledge and Systems Engineering, KSE 2015, Ho Chi Minh City, Vietnam, October 8-10, 2015, pp.37-42, 2015-10, 2015
35. Souza,VMAd, Silva,DF, Gama,J, Batista,GEAPA, "Data Stream Classification Guided by Clustering on Nonstationary Environments and Extreme Verification Latency", Proceedings of the 2015 SIAM International Conference on Data Mining, Vancouver, BC, Canada, April 30 - May 2, 2015, pp.873-881, 2015
36. Stoyanova,J, Brito,PQ, Georgieva,P, Milanova,M, "Comparison of consumer purchase intention between interactive and augmented reality shopping platforms through statistical analyses", 2015 International Symposium on Innovations in Intelligent Systems and Applications (INISTA), 2015-9, 2015
37. Cardoso,DO, Franca,F, Gama,J, "A Bounded Neural Network for Open Set Recognition", 2015 INTERNATIONAL JOINT CONFERENCE ON NEURAL NETWORKS (IJCNN), 2015
38. Almeida,V, Gama,J, "Prediction intervals for electric load forecast: Evaluation for different profiles", 2015 18th International Conference on Intelligent System Application to Power Systems, ISAP 2015, 2015-9, 2015
39. Mendes Moreira,J, Moreira Matias,L, "On learning from taxi-GPS traces", CEUR Workshop Proceedings, vol.1526, 2015

G.3. Books (Author)

1. Almeida,JP, Oliveira,JF, Pinto,AA, "Operational Research", CIM Series in Mathematical Sciences, 2015, 2015
2. Bourguignon,J, Jeltsch,R, Pinto,AA, Viana,M, "Mathematics of Energy and Climate Change", CIM Series in Mathematical Sciences, 2015, 2015
3. Bourguignon,J, Jeltsch,R, Pinto,AA, Viana,M, "Dynamics, Games and Science", CIM Series in Mathematical Sciences, 2015, 2015

G.4. Chapter/Paper in Books

1. Gonçalves,JF, De Mendes,JJM, Resende,MGC, "The basic multi-project scheduling problem", Handbook on Project Management and Scheduling Vol. 2, pp.667-683, 2014-10-8, 2015
2. Rodrigues,P, Gama,J, "Distributed Reasoning", CIM Series in Mathematical Sciences - Mathematics of Energy and Climate Change, pp.307-316, 2015, 2015
3. Mousa,AS, Pinheiro,D, Pinto,AA, "A Consumption-Investment Problem with a Diminishing Basket of Goods", Operational Research - CIM Series in Mathematical Sciences, pp.295-310, 2015, 2015

G.5. Publications (Editor)

1. Appice,A, Rodrigues,PP, Costa,VS, Soares,C, Gama,J, Jorge,A, "Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2015, Porto, Portugal, September 7-11, 2015, Proceedings, Part I", ECML/PKDD (1), vol.9284, 2015, 2015
2. Appice,A, Rodrigues,PP, Costa,VS, Gama,J, Jorge,A, Soares,C, "Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2015, Porto, Portugal, September 7-11, 2015, Proceedings, Part II", ECML/PKDD (2), vol.9285, 2015, 2015

3. Vanschoren,J, Brazdil,P, Carrier,CGG, Kotthoff,L, "Proceedings of the 2015 International Workshop on Meta-Learning and Algorithm Selection co-located with European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases 2015 (ECMLPKDD 2015), Porto, Portugal, Septembe", MetaSel@PKDD/ECML, vol.1455, 2015-10-06, 2015
4. Venturini,G, Brito,P, "Symbolic Data Analysis and Visualization: Special Issue in honor of Monique Noirhomme-Fraiture", Symbolic Data Analysis and Visualization, vol.E-29, 2015
5. Usó,AM, Moreira,JM, Matias,LM, Kull,M, Lachiche,N, "Proceedings of the ECML/PKDD 2015 Discovery Challenges co-located with European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD 2015), Porto, Portugal, September 7-11, 2015", DC@ECML/PKDD, vol.1526, 2015

G.6. Other Publications

1. Dias,A, Campos,P, Garrido,P, "An agent based propagation model of bank failures", Lecture Notes in Economics and Mathematical Systems, vol.676, pp.119-130, 2014-10-17, 2015
2. Bielza,C, Gama,J, Jorge,A, Zliobaite,I, "Guest editors introduction: special issue of the ECMLPKDD 2015 journal track", DATA MINING AND KNOWLEDGE DISCOVERY, vol.29, no.5, pp.1113-1115, SEP, 2015
3. Bielza,C, Gama,J, Jorge,A, Zliobaite,I, "Guest Editors introduction: special issue of the ECMLPKDD 2015 journal track", MACHINE LEARNING, vol.100, no.2-3, pp.157-159, SEP, 2015
4. Vinagre,J, Jorge,AM, Gama,J, "An overview on the exploitation of time in collaborative filtering", WILEY INTERDISCIPLINARY REVIEWS-DATA MINING AND KNOWLEDGE DISCOVERY, vol.5, no.5, pp.195-215, SEP-OCT, 2015
5. Derczynski,L, Stroetgen,J, Campos,R, Alonso,O, "Time and information retrieval: Introduction to the special issue", INFORMATION PROCESSING & MANAGEMENT, vol.51, no.6, pp.786-790, NOV, 2015
6. Rodrigues,PP, Bifet,A, Krishnaswamy,S, Gama,J, "Special track on data streams", Proceedings of the ACM Symposium on Applied Computing, vol.13-17-April-2015, pp.933-934, 2015

CENTRE FOR RESEARCH IN ADVANCED COMPUTING SYSTEMS

A. DESCRIPTION OF THE RESEARCH CENTRE

CRACS aims at developing fundamental and applied original research with international impact, promote national and international cooperation, foster the training of highly qualified researchers, and actively establish partnerships with industry to promote and disseminate research results.

CRACS is organized in three main research areas, following the expertise of the team, namely languages and distributed computing, security and privacy, and knowledge in a world of data.

CRACS was originally created in 2007 as an autonomous FCT research unit, evaluated as Very Good in the last evaluation exercise, being one of the very few receiving this high mark. It started with 8 senior researchers and around 20 other junior researchers. Today, CRACS is composed by 15 integrated members and around 40 associate members of which 14 are PhD students, 4 Post-Docs, 20 junior researchers working in their masters and/or in funded research projects, and 2 senior collaborators. One half-time secretary provides administrative support to the whole group.

CRACS aims at providing a simple yet effective organizational structure. The management structure follows the general model implemented throughout INESC TEC. Management is ensured by a Coordinator, a Coordination Committee and a Scientific Committee. The Scientific Committee is composed by all integrated members of CRACS and among its functions is to elect the Coordinator and discuss and approve medium/long term strategic decisions. The Coordination Committee is composed by the Coordinator, which represents CRACS, and one or two other nominated members. This Committee will also advise the INESC TEC Board in the integration of CRACS in the Computer Science cluster coordination.

CRACS has committed significant project funding to ensure sufficient computational resources to support research in parallel computing and scalable algorithms. This was a strategic decision that should be kept as such resources require renovation from time to time.

CRACS shares the advisory scientific board of INESC-TEC, which is composed by highly experienced international CS researchers.

Administrative and secretarial support dedicated to CRACS will be in place.

We are motivated by the challenges on the interface between programming languages, logic, probabilities, data structures, and learning. Scalability is a common motif in our work: scalable representations, scalable retrieval of data, scalable discovery algorithms, and automated decision making in the presence of large data. Research goals are anchored in three main research areas, that we detail next:

LANGUAGES AND DISTRIBUTED COMPUTING

Our goal has always been to develop high-level programming languages. In future work, we plan to focus on languages that can take advantage of large-scale execution infrastructures. Scalability involves not only the usual aspects of performance, e.g., speedups for parallel applications, but also, deployment and management issues, e.g., a correct by design programming language for WSN allows the programming, deployment and management of a large scale sensing infra-structure by statically guaranteeing that applications will not produce run-time errors. Coupled with an appropriate middleware layer such languages could be used to seamlessly configure, deploy and manage large scale WSN. We are also interested in the development of large-scale computing infra-structures, e.g., clouds, based on large collections of ubiquitous devices connected through ad-hoc networks. Such infrastructures will, in our view, revolutionize the way people interact with technology and provide the grounds for the development of important services, e.g., setting up basic communication networks for first response in the event of a catastrophe.

SECURITY AND PRIVACY

Following the line of work we have been developing with the Portuguese Data Protection Commission and keeping in mind the problems regarding security and privacy raised by the other lines of research of the group we plan to focus and strength our work on algorithms and methodologies to improve the usability of privacy and security in software and systems, namely on user-controlled identity management systems that respect user privacy and protect personally identifiable information. The main focus of this line of research is to promote and raise the Privacy by Design parading in opposition to the traditional privacy by redesign approach. We will also continue our work on secure identity cards and authentication mechanisms with a view to ensure access control to physical locations or networks, as well as to enable identity verification in online transactions or governmental services communications to guarantee its data integrity and non-repudiation properties; specialized algorithms and tools for sharing sensitive data while preserving privacy.

KNOWLEDGE IN A WORLD OF DATA

The Internet is our first domain of interest, a source and consumer of all kinds of data. A case in point and a challenge to our techniques are Massive Online Open Programming Courses (MOOCs); world scale programming contests, such as IEEExtreme; and Federated Libraries. We shall apply our experience with the successful Mooshak system in tools for massive program submissions and online evaluations. In related work we will research socially assisted annotated documents, and digital repositories of learning objects, a rich source of structured data for learning.

A different, but at least as valuable source of challenging data is medical record data, such as Electronic Health records. This is noisy, incomplete data, and as larger databases are being established, it raises a number of scalability issues. We strongly believe that the integration of EHRs, and high-throughput genomic data provides a great opportunity and challenge for scalable multi-relational learning.

Applications will tie our work together with areas such as author identification, semantic relatedness, sentiment discovery, interesting node discovery, sensor data streams, medical data, and genomics data.

B. MAIN ACHIEVEMENTS

Over the years, CRACS has been quite successful in consolidating the research team, attracting young talented researchers, sustaining the publication ratio of the team at an excellent level, increasing international cooperation, and participating in program committees of reputable international conferences. Some highlights of 2015 follow:

RESULTS

CRACS was successful with 5 new projects: 1 FCT project, 2 UTAustin-Portugal projects, and 4 N2020 projects, totaling over 1,100,000 euros of competitive funding.

CRACS published over 56 publications: 9 in journal, 35 in international conferences (23 of which in proceedings by Springer, ACM, or IEEE), 1 technical book, 7 book proceedings, and 2 book chapters.

CRACS members participated in the organization and/or PCs of a good number of relevant conferences, such as ECML PKDD, ICLP, ILP, AAAI, FAB, FSCD, PADL, MOD, EPIA, StaRAI, IDEAS, CSE, FLOPS.

Regarding advanced training: 13 MSc and 2 PhD theses were concluded. There are 8 phd on going. 28 junior researchers were hired with project funding.

ACTIVITIES

Yap: a highly reliable and performing Prolog system developed by CRACS group since the 80s. It is a vehicle for research as well as for teaching and industry. Research achievements around Yap and logic based systems have been:

- started the development of a new version of Yap that able to integrate Python, Java and R environments;
- a new approach for multithreaded tabling in Prolog based on a lock-free hash trie design for concurrent accesses to the table space data structures;
- a first implementation of an or-parallel Prolog system specially designed to explore the combination of shared and distributed memory architectures in clusters of multicores;
- a new concurrent forward-chaining linear logic programming language, called Linear Meld (LM), which supports coordination and structured manipulation of mutable state in cooperation with CMU;
- a new Stochastic Inductive Logic Learner (SkILL), which takes probabilistic annotated data and produces First Order Logic theories. SkILL's capabilities were demonstrated using a real world medical dataset in the breast cancer domain.

Logtalk: 3rd generation of this OO LP language became available in early 2015. It focused on refined semantics, performance, and reliability, with an extensive reflection API. Later in 2015 a US company, Kyndi Inc., sponsored the move to a more commercial-friendly license, Apache 2.0, and have been sponsoring regular Logtalk updates with an emphasis on developer tools.

Hyrax: a first version of a user generator replay crowdsourcing app was produced; the middleware of Hyrax to seamlessly support the multiple layers, network overlays, services and applications has been continued; work on the app for distributed photo search has also started.

A general typed language that deals with the notion of event in the context of access control systems with obligations and a metamodel for access control with obligations using a rewrite based semantics; and a graphical framework for the specification and verification of policies, using the CBAC metamodel (category-based access control)

Graph Mining: focused on pattern discovery, and we developed new efficient algorithms for approximate subgraph census, new data structures for large graphs, a new methodology for discovering roles in

informations cascades and a new algorithm scalable algorithm for boolean matrix decomposition. From an application point of view, we conducted detailed analysis of gene co-expression networks and tennis networks.

REMINDS: development of a system to automatically filter and identify potentially relevant information, from a journalistic perspective, in social media.

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	148	212	159	149	160	7%
European Union Programmes	5	20	22	23		-100%
R&D Services and Consulting	60	45		31	276	790%
Other R&D sources						
Other external sources						
Total	213	277	181	203	436	115%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	6	33%	160	37%
	National Programmes - QREN				
	National Programmes – P2020				
	National Programmes - PICT	6	33%		
	European Union Programmes – FP7				
	European Union Programmes – H2020				
	European Union Programmes - Other				
	R&D Services and Consulting - National	6	33%	276	63%
	R&D Services and Consulting – European Union				
	R&D Services and Consulting - International				
	Other R&D sources				
	Other external sources				
	Internal				
Dominant Activity type	Basic Research	11	61%	151	35%
	Applied Research and Development	2	11%	186	43%
	Consulting	5	28%	99	23%
	Technology Transfer				
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	10	56%	123	28%
	Continuation	5	28%	253	58%
	Started and Concluded within the year				
	Concluded	3	17%	60	14%
Total		18		436	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication						
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	6	10	16	18	9	9
International conference Proceedings with scientific referees	39	38	51	38	34	35
Books - Author			3	1	1	1
Chapter in books	6	3	1	6	2	4
Publications (Editor)		2		4	5	3
Other Publications		1		1	1	4
Total	51	54	71	68	52	56

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	13
Doctoral	2
Total	15

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
ADE	Vítor Santos Costa	RES	PROG - NAT	FCT / POFC	PROJ IC&DT		PROP	2012-03	FIN
ABLE	Inês Dutra	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2013-05	FIN
Authenticus	Fernando Silva	CONS	PROG - NAT	FCT		NAT	PROP	2013-04	CONT
Hyrax	Fernando Silva	RES	PROG - NAT	FCT	PROJ CMU	INT	PROP	2014-04	CONT
REMINDS	Álvaro Figueira	RES	PROG - NAT	FCT	PROJ UT Austin	INT	PROP	2015-04	START
FOTOCATGRAF	Luís Lopes	RES	PROG - NAT	FCT	PROJ UT Austin	INT	PAR	2015-06	START
NanoStima-RL3	Luís Antunes	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START
NanoStima-RL4	Luís Antunes	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START
DAT	Inês Dutra	DES	SERV - NAT	POFC / POR	PROJ INDIV		SUB	2014-01	CONT
MGI	Manuel Eduardo Correia	CONS	SERV - NAT				CONT	2015-01	START
PANF	Fernando Silva	CONS	SERV - NAT				CONT	2015-04	START
Consultoria	Fernando Silva	CONS	SERV - NAT				CONT	2010-01	CONT

Dominant Activity Type:

RES – Research
 DEV – Development
 CONS - Consulting
 TT - Technology Transfer
 NET - Network
 CONF - Conference
 TRAIN - Advanced Training
 INC - Incubation
 O - Other

Source:

PROG – NAT – National Programmes
 PROG – EU – European Union Programmes
 SERV - NAT - Supply of Services - National
 SERV - EU - Supply of Services - European Union
 SERV - INT - Supply of Services - International
 ORD - Other R&D Services
 O - Other External Services
 INT - Internal

Type:

IND – Individual Project
 NAT - National Cooperation
 EU - European Union Cooperation (EU+Associated Countries)
 INT - Internal Cooperation

Role INESCP:

PROP - Proponent
 PAR - Partner
 CONT - Prime Contractor
 SUB - Subcontractor
 MEMB - Member
 O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Ferreira,P, Fonseca,NA, Dutra,I, Woods,R, Burnside,E, "Predicting malignancy from mammography findings and image-guided core biopsies", INTERNATIONAL JOURNAL OF DATA MINING AND BIOINFORMATICS, vol.11, no.3, pp.257-276, 2015-03-18, 2015
2. Alves,S, Fernandez,M, "A Framework for the Analysis of Access Control Policies with Emergency Management", Electronic Notes in Theoretical Computer Science, vol.312, pp.89-105, 2015-04-30, 2015
3. Paredes,P, Ribeiro,P, "Rand-FaSE: fast approximate subgraph census", Social Network Analysis and Mining, vol.5, no.1, pp.1-18, 2015-05-28, 2015
4. Leal,JP, Costa,T, "Tuning a Semantic Relatedness Algorithm using a Multiscale Approach", COMPUTER SCIENCE AND INFORMATION SYSTEMS, vol.12, no.2, pp.635-654, JUN, 2015

5. Alves,S, Broda,S, "A short note on type-inhabitation: Formula-trees vs. game semantics", INFORMATION PROCESSING LETTERS, vol.115, no.11, pp.908-911, NOV, 2015
6. Choobdar,S, Ribeiro,P, Parthasarathy,S, Silva,F, "Dynamic inference of social roles in information cascades", DATA MINING AND KNOWLEDGE DISCOVERY, vol.29, no.5, pp.1152-1177, SEP, 2015
7. Schwartz,MP, Hou,ZG, Propson,NE, Zhang,J, Engstrom,CJ, Costa,VS, Jiang,P, Nguyen,BK, Bolin,JM, Daly,W, Wang,Y, Stewart,R, Page,CD, Murphy,WL, Thomson,JA, "Human pluripotent stem cell-derived neural constructs for predicting neural toxicity", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol.112, no.40, pp.12516-12521, OCT 6, 2015
8. Aparício,DO, Ribeiro,PMP, Silva,FMA, "Network comparison using directed graphlets", CoRR, vol.abs/1511.01964, 2015
9. Ferreira,CA, Gama,J, Costa,VS, "Exploring multi-relational temporal databases with a propositional sequence miner", Progress in AI, vol.4, no.1-2, pp.11-20, 2015-11-27, 2015

G.2. International Conference Proceedings with scientific referees

1. Corte Real,J, Dutra,I, Rocha,R, "A hybrid mapreduce model for prolog", Proceedings of the 14th International Symposium on Integrated Circuits, ISIC 2014, pp.340-343, 2014-12, 2015
2. Pereira,M, Alves,S, Florido,M, "Liquid Intersection Types", Proceedings Seventh Workshop on Intersection Types and Related Systems, ITRS 2014, Vienna, Austria, 18 July 2014., vol.177, pp.24-42, 2015-04-10, 2015
3. Alves,S, Degtyarev,A, Fernandez,M, "Access Control and Obligations in the Category-Based Metamodel: A Rewrite-Based Semantics", LOGIC-BASED PROGRAM SYNTHESIS AND TRANSFORMATION (LOPSTR 2014), vol.8981, pp.148-163, 2015-04-23, 2015
4. Cruz,F, Rocha,R, "On Compiling Linear Logic Programs with Comprehensions, Aggregates and Rule Priorities", PRACTICAL ASPECTS OF DECLARATIVE LANGUAGES, PADL 2015, vol.9131, pp.34-49, 2015-06-15, 2015
5. Choobdar,S, Ribeiro,P, Silva,F, "Discovering weighted motifs in gene co-expression networks", Proceedings of the ACM Symposium on Applied Computing, vol.13-17-April-2015, pp.10-17, 2015-07-21, 2015
6. Figueira,A, Pereira,R, "Managing and assessing group work from a distance", Proceedings - Frontiers in Education Conference, FIE, vol.2015-February, no.February, 2014-10, 2015
7. Ferreira,R, Correia,ME, Rocha Goncalves,F, Cruz Correia,R, "Visualization of passively extracted HL7 production metrics", HEALTHINF 2015 - 8th International Conference on Health Informatics, Proceedings; Part of 8th International Joint Conference on Biomedical Engineering Systems and Technologies, BIOSTEC 2015, pp.423-430, 2015-09-11, 2015
8. Silva,C, Antunes,M, Costa,J, Ribeiro,B, "Active Manifold Learning with Twitter Big Data", INNS CONFERENCE ON BIG DATA 2015 PROGRAM, vol.53, no.1, pp.208-215, 2015, 2015
9. Mantadelis,T, Oliveira,J, Coimbra,M, "Most probable explanation for MetaProbLog and its application in heart sound segmentation", CEUR Workshop Proceedings, vol.1413, pp.39-45, 2015-11-29, 2015
10. Ferreira,R, Correia,ME, Rocha Goncalves,F, Cruz Correia,R, "Data Quality in HL7 Messages - A Real Case Analysis", 2015 IEEE 28TH INTERNATIONAL SYMPOSIUM ON COMPUTER-BASED MEDICAL SYSTEMS (CBMS), vol.2015-July, pp.197-200, 2015-07-29, 2015
11. Goncalves,RP, Augusto,AB, Correia,ME, "Time/Space based Biometric Handwritten Signature Verification", PROCEEDINGS OF THE 2015 10TH IBERIAN CONFERENCE ON INFORMATION SYSTEMS AND TECHNOLOGIES (CISTI 2015), 2015-6, 2015
12. Cruz,F, Rocha,R, Goldstein,SC, "Thread-aware logic programming for data-driven parallel programs", CEUR Workshop Proceedings, vol.1433, 2015-09-04, 2015

13. Figueira,A, "Predicting results from interaction patterns during online group work", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9307, pp.414-419, 2015-09-08, 2015
14. Rodrigues,AV, Jorge,A, Dutra,I, "Accelerating recommender systems using GPUs", Proceedings of the ACM Symposium on Applied Computing, vol.13-17-April-2015, pp.879-884, 2015, 2015
15. Nabizadeh,AH, Jorge,AM, Leal,JP, "Long term goal oriented recommender systems", WEBIST 2015 - 11th International Conference on Web Information Systems and Technologies, Proceedings, pp.552-557, 2015-08-03, 2015
16. Real,JC, Mantadelis,T, Dutra,IdC, Rocha,R, Burnside,ES, "SkILL - A Stochastic Inductive Logic Learner", 14th IEEE International Conference on Machine Learning and Applications, ICMLA 2015, Miami, FL, USA, December 9-11, 2015, pp.555-558, 2015
17. Mickulicz,ND, Martins,R, Narasimhan,P, Gandhi,R, "When Good-Enough is Enough: Complex Queries at Fixed Cost", First IEEE International Conference on Big Data Computing Service and Applications, BigDataService 2015, Redwood City, CA, USA, March 30 - April 2, 2015, pp.89-98, 2015-08-17, 2015
18. Pinto,D, Costa,P, Camacho,R, Costa,VS, "Predicting Drugs Adverse Side-Effects Using a Recommender-System", DISCOVERY SCIENCE, DS 2015, vol.9356, pp.201-208, 2015-10-05, 2015
19. Barros,J, Araujo,M, Rossetti,RJF, "Short-term real-time traffic prediction methods: A survey", 2015 International Conference on Models and Technologies for Intelligent Transportation Systems, MT-ITS 2015, pp.132-139, 2015-6, 2015
20. Choobdar,S, Ribeiro,P, Silva,F, "Pairwise structural role mining for user categorization in information cascades", PROCEEDINGS OF THE 2015 IEEE/ACM INTERNATIONAL CONFERENCE ON ADVANCES IN SOCIAL NETWORKS ANALYSIS AND MINING (ASONAM 2015), pp.137-144, 2015, 2015
21. Mantadelis,T, Shterionov,D, Janssens,G, "Compacting boolean formulae for inference in probabilistic logic programming", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9345, pp.425-438, 2015-09-15, 2015
22. Ferro,G, Silva,R, Lopes,L, "Towards out-of-the-box programming of Wireless Sensor-Actuator Networks", Proceedings - IEEE 18th International Conference on Computational Science and Engineering, CSE 2015, pp.110-119, 2015-10, 2015
23. Alves,S, Broda,S, Fernández,M, "A typed language for events", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9527, pp.107-123, 2015, 2015
24. Pinto Silva,PMP, Silva Cunha,JPS, "SenseMyHeart: A Cloud Service and API for Wearable Heart Monitors", 2015 37TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY (EMBC), vol.2015-November, pp.4986-4989, 2015-8, 2015
25. Silva,J, Aguiar,A, Silva,F, "A parallel computing hybrid approach for feature selection", Proceedings - IEEE 18th International Conference on Computational Science and Engineering, CSE 2015, pp.97-104, 2015-10, 2015
26. Oliveira,L, Figueira,, "Benchmarking Analysis of Social Media Strategies in the Higher Education Sector", Procedia Computer Science, vol.64, pp.779-786, 2015, 2015
27. Costa,J, Silva,C, Antunes,M, Ribeiro,B, "The Impact of Longstanding Messages In Micro-Blogging Classification", 2015 INTERNATIONAL JOINT CONFERENCE ON NEURAL NETWORKS (IJCNN), vol.2015-September, 2015-7, 2015
28. Sousa,R, Leal,JP, "A Structural Approach to Assess Graph-Based Exercises", LANGUAGES, APPLICATIONS AND TECHNOLOGIES, SLATE 2015, vol.563, pp.182-193, 2015
29. Costa,J, Silva,C, Antunes,M, Ribeiro,B, "DOTS: Drift oriented tool system", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9492, pp.615-623, 2015

30. Paiva,JC, Leal,JP, Queiros,R, "Odin: A Service for Gamification of Learning Activities", LANGUAGES, APPLICATIONS AND TECHNOLOGIES, SLATE 2015, vol.563, pp.194-204, 2015
31. Salvini,R, Da Silva Dias,R, Lafer,B, Dutra,I, "A Multi-Relational Model for Depression Relapse in Patients with Bipolar Disorder", Studies in Health Technology and Informatics, vol.216, pp.741-745, 2015
32. Costa,T, Leal,JP, "Reducing Large Semantic Graphs to Improve Semantic Relatedness", LANGUAGES, APPLICATIONS AND TECHNOLOGIES, SLATE 2015, vol.563, pp.236-245, 2015
33. Areias,M, Rocha,R, "Batched Evaluation of Full-Sharing Multithreaded Tabling", LANGUAGES, APPLICATIONS AND TECHNOLOGIES, SLATE 2015, vol.563, pp.113-124, 2015
34. Emiliano,R, Antunes,M, "Automatic network configuration in virtualized environment using GNS3", 10th International Conference on Computer Science and Education, ICCSE 2015, pp.25-30, 2015
35. Sierra Rodríguez,JL, Leal,JP, Simões,A, "Languages, applications and technologies: 4th International Symposium, SLATE 2015 Madrid, Spain, June 18-19, 2015 Revised Selected Papers", Communications in Computer and Information Science, vol.563, 2015, 2015

G.3. Books (Author)

1. Barbosa,JG, Dutra,I, "Grid computing: Techniques and future prospects", Grid Computing: Techniques and Future Prospects, pp.1-213, 2015

G.4. Chapter/Paper in Books

1. Queirós,R, Leal,JP, "Ensemble:", Innovative Teaching Strategies and New Learning Paradigms in Computer Programming, pp.173-201, 2015, 2015
2. Queirós,R, Leal,JP, Paiva,JC, "Integrating Rich Learning Applications in LMS", State-of-the-Art and Future Directions of Smart Learning - Lecture Notes in Educational Technology, pp.381-386, 2015-10-27, 2015
3. Velikova,M, Dutra,I, Burnside,ES, "Automated Diagnosis of Breast Cancer on Medical Images", Foundations of Biomedical Knowledge Representation - Methods and Applications, vol.9521, pp.47-67, 2015
4. Davis,J, Costa,VS, Peissig,PL, Caldwell,M, Page,D, "Predicting Adverse Drug Events from Electronic Medical Records", Foundations of Biomedical Knowledge Representation - Methods and Applications, vol.9521, pp.243-257, 2015

G.5. Publications (Editor)

1. Alves,S, Cervesato,I, "Proceedings Third International Workshop on Linearity, LINEARITY 2014, Vienna, Austria, 13th July, 2014", LINEARITY, vol.176, 2015-04-10, 2015
2. Appice,A, Rodrigues,PP, Costa,VS, Soares,C, Gama,J, Jorge,A, "Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2015, Porto, Portugal, September 7-11, 2015, Proceedings, Part I", ECML/PKDD (1), vol.9284, 2015, 2015
3. Appice,A, Rodrigues,PP, Costa,VS, Gama,J, Jorge,A, Soares,C, "Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2015, Porto, Portugal, September 7-11, 2015, Proceedings, Part II", ECML/PKDD (2), vol.9285, 2015, 2015

G.6. Other Publications

1. Dias,R, Salvini,R, Dutra,I, Lafer,B, "A multi-relational model for depression relapse in patients with bipolar disorder by means of a machine learning approach", BIPOLAR DISORDERS, vol.17, pp.128-128, JUN, 2015
2. Zaverucha,G, Costa,VS, "Guest editors' introduction: special issue on Inductive Logic Programming and on Multi-Relational Learning", MACHINE LEARNING, vol.100, no.1, pp.1-3, JUL, 2015

3. Lengauer,C, Bouge,L, Silva,F, "Special Issue: Euro-Par 2014", CONCURRENCY AND COMPUTATION-PRACTICE & EXPERIENCE, vol.27, no.16, pp.4073-4074, NOV, 2015
4. Barbosa,JG, Dutra,I, "Preface", Grid Computing: Techniques and Future Prospects, pp.vii-ix, 2015

INDUSTRIAL ENGINEERING AND MANAGEMENT

A. DESCRIPTION OF THE RESEARCH CENTRE

CEGI follows a matrix organizational structure based on three knowledge fields (Service Design and Engineering, Decision Support and Intelligent Systems, and Performance Management and Business Intelligence) and on four application areas (Manufacturing, Retail, Health and Mobility). Each of the knowledge fields is headed by two senior researchers that are responsible to lead the research in the respective topic and look for funding opportunities. Each of the application areas is also promoted by two senior researchers that facilitate the flow of information, skills and opportunities around the respective area.

This management structure is led by two coordinators and an advisory board.

This matrix organization aims to attain the following goals on the three knowledge fields:

SERVICE DESIGN AND ENGINEERING

In the service design and engineering knowledge field there are three intertwined goals to be addressed:

- Design and engineering of Complex Service Systems and Value Networks, creating new services in the context of distributed and interconnected value co-creating actors, such as health care.
- Designing for the Customer Experience, involving the pursuit for a holistic understanding of the customer experience and a human-centered design approach that continuously feeds the service design process with customer experience input.
- Designing and engineering of technology enabled services, integrating multiple disciplines such as ICT (Information and Communication Technologies), Human Computer Interaction, Service Design and Service Management, to support the transition from technology development to creation of innovative services that create value for customers and organizations, particularly in the areas of mobile services, smart services, and social networks.

DECISION SUPPORT AND INTELLIGENT SYSTEMS

In this knowledge field, researchers design, develop and implement quantitative models, methods and tools to solve operations management problems in the four application areas (health, retail, mobility and manufacturing). These problems involve different decision making procedures, planning horizons, entities and objectives, and are usually classified according to their hierarchical level:

Strategic (e.g., Capacity Planning);

Tactical (e.g., Resource Allocation);

Operational (e.g., Scheduling and Control).

The solution approaches used to tackle this problems trade-off effectiveness and efficiency, and include:

- Mathematical modeling and programming.
- Robust and efficient optimization algorithms to produce resilient solutions, adaptable to frequent changes in the operating conditions.
- Matheuristics that exploit the hybridization of mathematical programming techniques in (meta)heuristic frameworks.
- Simulation-based Optimization that integrate optimization techniques into simulation analysis.

The overall goal is to address the several challenges related to model and solve these problems. This effort requires advances in the state-of-the-art of mathematical programming and solution approaches.

PERFORMANCE MANAGEMENT AND BUSINESS INTELLIGENCE

Regarding the performance assessment stream, there are several goals to be addressed:

- Performance assessments exploring Data Envelopment Analysis, econometric and statistical techniques.
- Developing enhanced efficiency and productivity measurement models that can identify the drivers of good performance in companies.
- Enhancing organizational performance in different sectors and promoting robust benchmarking.
- Exploring new methodologies to assess and improve quality of life and livability of urban areas, as they are essential to the sustainable development of countries given their role in the attractiveness of human capital.

In the Business Intelligence stream, which includes Data Mining, Data Analysis and Statistical methods (applied to companies' management), the goal is to address the needs of business by extracting knowledge from data that could be leveraged to increase, for example, revenues. To that end, new analytical techniques are required. Actually, the challenges placed by large data sets lead to a redefinition of the processes of data analysis to find patterns and relationships between data elements in large and noisy data sets.

These knowledge fields are not closed on their own. Therefore, CEGI aims to pursue research areas that are just at the interface of these fields. Namely, CEGI wants to investigate the methodologies that should be used to hybridize optimization and data-mining techniques. Moreover, the relevance of using service design and engineering approaches to better frame decision problems is another goal to be attained.

Currently, CEGI has 27 integrated PhD members. This number is expected to rise in the years to come as several structural projects were recently approved.

B. MAIN ACHIEVEMENTS

During the year of 2015, several researchers of CEGi have been distinguished with nominations and prizes, as follows:

1. J. A.Cabral. Award “Personalidade Qualidade 2015”, by Associação Portuguesa de Qualidade.
2. L.Guimarães. Award “BEST Operations Research Thesis”, by Associação Portuguesa de Investigação Operacional (APDIO).
3. L.Guimarães. “Isabel Themido Prize – best paper”, by APDIO.
4. T.Bianchi-Aguiar, E. Silva, L. Guimarães, J. F. Oliveira, M. A. Carravilla. Finalists of the “Wagner Prize award”, for Excellence in Operations Research Practice, by The Institute for Operations Research and the Management Sciences (INFORMS).
5. G.Beirão, L.Patricio. Highly-Commended Award paper at QUIS14 - 14th International Research Symposium on Service Excellence in Management.
6. A.Camanho. Best Reviewer of the Journal OMEGA (International Journal of Management Science).

Furthermore, one researcher of CEGi became Editor of one of the most prestigious journals in OR&MS: The European Journal of Operational Research (EJOR).

CEGi members did also act as members of the Organizing and Scientific Committees of international journals and coordinated and participated in XXX research projects funded by external entities (national and European).

As for post-graduated studies supervised by members of the Center, 56 Masters and 9 Doctoral dissertations were concluded in 2015.

It is also noteworthy that three members of CEGi co-founded a spin-off of INESC TEC dedicated to Business Analytics.

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes				135	43	-68%
European Union Programmes					19	
R&D Services and Consulting		54	54	255	366	44%
Other R&D sources						
Other external sources						
Total		54	54	390	428	10%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	2	11%	16	4%
	National Programmes - QREN				
	National Programmes – P2020				
	National Programmes - PICT	3	17%	27	6%
	European Union Programmes – FP7				
	European Union Programmes – H2020	1	6%	19	4%
	European Union Programmes - Other				
	R&D Services and Consulting - National	11	61%	330	77%
	R&D Services and Consulting – European Union	1	6%	36	8%
	R&D Services and Consulting - International				
	Other R&D sources				
	Other external sources				
	Internal				
Dominant Activity type	Basic Research	9	50%	227	53%
	Applied Research and Development	1	6%	26	6%
	Consulting	8	44%	175	41%
	Technology Transfer				
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	6	33%	82	19%
	Continuation	2	11%	88	21%
	Started and Concluded within the year	3	17%	86	20%
	Concluded	7	39%	172	40%
Total		18		428	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	12	12	20	36	40	38
International Conference Proceedings with scientific referees	8	17	24	24	13	14
Books - Author	1					
Chapter in books	1		6	3	11	9
Publications (Editor)	1	3		3	3	
Other Publications			9	11	47	3
Total	23	32	59	77	114	64

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	56
Doctoral	9
Total	65

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
WholeChain	Bernardo Almada Lobo	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2014-03	FIN
StableCargo	José Fernando Oliveira	RES	PROG - NAT	FCT / POFC	PROJ IC&DT	NAT	PROP	2012-04	FIN
PSS-DESIGN	Lia Patrício	CONS	SERV - NAT				CONT	2014-02	FIN
StorePacks	Pedro Amorim	RES	SERV - NAT				CONT	2014-09	FIN
ShortCut	Bernardo Almada Lobo	RES	SERV - NAT				CONT	2014-10	FIN
Supply_Chain	Bernardo Almada Lobo	RES	SERV - NAT				CONT	2014-11	CONT
ReliabilityEng2	Bernardo Almada Lobo	CONS	SERV - EU				CONT	2014-12	FIN
ShortPath	Pedro Amorim	CONS	SERV - NAT				CONT	2015-02	START
BestWare	Pedro Amorim	CONS	SERV - NAT				CONT	2015-03	START
Rent-a-Car-Pricing	Maria Antónia Carravilla	CONS	SERV - NAT				CONT	2015-01	START-FIN
RosaEvolution	Bernardo Almada Lobo	CONS	SERV - NAT				CONT	2015-04	START-FIN
HIDRO	Bernardo Almada Lobo	DEV	SERV - NAT				CONT	2015-06	START-FIN
UpGas	Bernardo Almada Lobo	CONS	SERV - NAT				CONT	2015-11	START
Consultoria	Bernardo Almada Lobo	CONS	SERV - NAT				CONT	2014-01	CONT

Dominant Activity Type:

RES – Research
 DEV – Development
 CONS - Consulting
 TT - Technology Transfer
 NET - Network
 CONF - Conference
 TRAIN - Advanced Training
 INC - Incubation
 O - Other

Source:

PROG – NAT – National Programmes
 PROG – EU – European Union Programmes
 SERV - NAT - Supply of Services - National
 SERV - EU - Supply of Services - European Union
 SERV - INT - Supply of Services - International
 ORD - Other R&D Services
 O - Other External Services
 INT - Internal

Type:

IND – Individual Project
 NAT - National Cooperation
 EU - European Union Cooperation (EU+Associated Countries)
 INT - Internal Cooperation

Role INESCP:

PROP - Proponent
 PAR - Partner
 CONT - Prime Contractor
 SUB - Subcontractor
 MEMB - Member
 O – Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

1. Carvalho,M, Pedroso,JP, Saraiva,J, "ELECTRICITY DAY-AHEAD MARKETS: COMPUTATION OF NASH EQUILIBRIA", JOURNAL OF INDUSTRIAL AND MANAGEMENT OPTIMIZATION, vol.11, no.3, pp.985-998, JUL, 2015
2. Oliveira,MM, Camanho,AS, Gaspar,MB, "The phycotoxins' impact on the revenue of the Portuguese artisanal dredge fleet", MARINE POLICY, vol.52, pp.45-51, FEB, 2015
3. Mendes Moreira,J, Moreira Matias,L, Gama,J, de Sousa,JF, "Validating the coverage of bus schedules: A Machine Learning approach", INFORMATION SCIENCES, vol.293, pp.299-313, FEB 1, 2015

4. Fontes,T, Pereira,SR, Fernandes,P, Bandeira,JM, Coelho,MC, "How to combine different microsimulation tools to assess the environmental impacts of road traffic? Lessons and directions", TRANSPORTATION RESEARCH PART D-TRANSPORT AND ENVIRONMENT, vol.34, pp.293-306, JAN, 2015
5. Amorim,P, Costa,AM, Almada Lobo,B, "A hybrid path-relinking method for solving two-stage stochastic integer problems", INTERNATIONAL TRANSACTIONS IN OPERATIONAL RESEARCH, vol.22, no.1, pp.113-127, JAN, 2015
6. Mendes Moreira,J, Jorge,AM, de Sousa,JF, Soares,C, "Improving the accuracy of long-term travel time prediction using heterogeneous ensembles", NEUROCOMPUTING, vol.150, no.PB, pp.428-439, FEB 20, 2015
7. Almeder,C, Klabjan,D, Traxler,R, Almada Lobo,B, "Lead time considerations for the multi-level capacitated lot-sizing problem", EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, vol.241, no.3, pp.727-738, MAR 16, 2015
8. Furlan,M, Almada Lobo,B, Santos,M, Morabito,R, "Unequal individual genetic algorithm with intelligent diversification for the lot-scheduling problem in integrated mills using multiple-paper machines", COMPUTERS & OPERATIONS RESEARCH, vol.59, pp.33-50, JUL, 2015
9. Ramos,P, Santos,N, Rebelo,R, "Performance of state space and ARIMA models for consumer retail sales forecasting", ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING, vol.34, pp.151-163, AUG, 2015
10. Barros,N, Fontes,T, Silva,MP, Manso,MC, Carvalho,AC, "Analysis of the effectiveness of the NEC Directive on the tropospheric ozone levels in Portugal", ATMOSPHERIC ENVIRONMENT, vol.106, pp.80-91, APR, 2015
11. Figueira,G, Amorim,P, Guimaraes,L, Amorim Lopes,M, Neves Moreira,F, Almada Lobo,B, "A decision support system for the operational production planning and scheduling of an integrated pulp and paper mill", COMPUTERS & CHEMICAL ENGINEERING, vol.77, pp.85-104, JUN 9, 2015
12. Real,AC, Borges,J, Sarsfield Cabral,JS, Jones,GV, "Partitioning the grapevine growing season in the Douro Valley of Portugal: accumulated heat better than calendar dates", INTERNATIONAL JOURNAL OF BIOMETEOROLOGY, vol.59, no.8, pp.1045-1059, AUG, 2015
13. Zanella,A, Camanho,AS, Dias,TG, "The assessment of cities' livability integrating human wellbeing and environmental impact", ANNALS OF OPERATIONS RESEARCH, vol.226, no.1, pp.695-726, MAR, 2015
14. Parragh,SN, de Sousa,JP, Almada Lobo,B, "The Dial-a-Ride Problem with Split Requests and Profits", TRANSPORTATION SCIENCE, vol.49, no.2, pp.311-334, MAY, 2015
15. Brandão,F, Pedroso,JP, "Cutting Stock with Binary Patterns: Arc-flow Formulation with Graph Compression", CoRR, vol.abs/1502.02899, 2015-03-02, 2015
16. Zanella,A, Camanho,AS, Dias,TG, "Undesirable outputs and weighting schemes in composite indicators based on data envelopment analysis", EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, vol.245, no.2, pp.517-530, SEP 1, 2015
17. Martins,J, Camanho,A, Oliveira,M, Gaspar,M, "A system dynamics model to support the management of artisanal dredge fisheries in the south coast of Portugal", INTERNATIONAL TRANSACTIONS IN OPERATIONAL RESEARCH, vol.22, no.4, pp.611-634, JUL, 2015
18. Kapelko,M, Horta,IM, Camanho,AS, Lansink,AO, "Measurement of input-specific productivity growth with an application to the construction industry in Spain and Portugal", INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS, vol.166, pp.64-71, AUG, 2015
19. Horta,IM, Camanho,AS, "A nonparametric methodology for evaluating convergence in a multi-input multi-output setting", EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, vol.246, no.2, pp.554-561, OCT 16, 2015

20. Dragoicea,M, Falcao e Cunha,JFE, Patrascu,M, "Self-organising socio-technical description in service systems for supporting smart user decisions in public transport", EXPERT SYSTEMS WITH APPLICATIONS, vol.42, no.17-18, pp.6329-6341, OCT, 2015
21. Real,AC, Borges,J, Cabral,JS, Jones,GV, "Partitioning the grapevine growing season in the Douro Valley of Portugal: accumulated heat better than calendar dates", International Journal of Biometeorology, vol.59, no.8, pp.1045-1059, 2014-10-25, 2015
22. Moreira Matias,L, Mendes Moreira,J, de Sousa,JF, Gama,J, "Improving Mass Transit Operations by Using AVL-Based Systems: A Survey", IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.16, no.4, pp.1636-1653, AUG, 2015
23. Belo Filho,MAF, Amorim,P, Almada Lobo,B, "An adaptive large neighbourhood search for the operational integrated production and distribution problem of perishable products", INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH, vol.53, no.20, pp.6040-6058, OCT 18, 2015
24. Dias,J, Rocha,H, Viana,A, "Special issue on "Improving Healthcare: new challenges, new approaches"", INTERNATIONAL TRANSACTIONS IN OPERATIONAL RESEARCH, vol.22, no.5, pp.949-950, SEP, 2015
25. Rodrigues,V, Akesson,B, Florido,M, de Sousa,SM, Pedroso,JP, Vasconcelos,P, "Certifying execution time in multicores", SCIENCE OF COMPUTER PROGRAMMING, vol.111, no.P3, pp.505-534, NOV 1, 2015
26. Wuenderlich,NV, Heinonen,K, Ostrom,AL, Patricio,L, Sousa,R, Voss,C, Lemmink,JGAM, ""Futurizing" smart service: implications for service researchers and managers", JOURNAL OF SERVICES MARKETING, vol.29, no.6-7, pp.442-447, 2015-9-14, 2015
27. Fernandes,P, Fontes,T, Pereira,SR, Rouphail,NM, Coelho,MC, "Multicriteria Assessment of Crosswalk Location in Urban Roundabout Corridors", TRANSPORTATION RESEARCH RECORD, vol.2517, no.2517, pp.37-47, 2015-8, 2015
28. Fernandes,P, Fontes,T, Neves,M, Pereira,SR, Bandeira,JM, Rouphail,NM, Coelho,MC, "Assessment of Corridors with Different Types of Intersections Environmental and Traffic Performance Analysis", TRANSPORTATION RESEARCH RECORD, no.2503, pp.39-50, 2015
29. Galrao Ramos,AG, Oliveira,JF, Goncalves,JF, Lopes,MP, "Dynamic stability metrics for the container loading problem", TRANSPORTATION RESEARCH PART C-EMERGING TECHNOLOGIES, vol.60, pp.480-497, NOV, 2015
30. Fontes,T, Pereira,SR, Bandeira,JM, Coelho,MC, "Assessment of the effectiveness of fuel and toll pricing policies in motorway emissions: An ex-post analysis", RESEARCH IN TRANSPORTATION ECONOMICS, vol.51, pp.83-93, SEP, 2015
31. Gomes,R, de Sousa,JP, Dias,TG, "Sustainable Demand Responsive Transportation systems in a context of austerity: The case of a Portuguese city", RESEARCH IN TRANSPORTATION ECONOMICS, vol.51, pp.94-103, SEP, 2015
32. Castro,RAS, Oliveira,PN, Portela,CS, Camanho,AS, Queiroz e Melo,JQE, "Benchmarking clinical practice in surgery: looking beyond traditional mortality rates", HEALTH CARE MANAGEMENT SCIENCE, vol.18, no.4, pp.431-443, DEC, 2015
33. Dias,J, Rocha,H, Viana,A, "Special issue on ?Improving Healthcare: new challenges, new approaches?", Intl. Trans. in Op. Res. - International Transactions in Operational Research, vol.22, no.3, pp.607-608, 2015-4-9, 2015
34. Dias,J, Rocha,H, Viana,A, "Special issue on ?Improving Healthcare: new challenges, new approaches?", Intl. Trans. in Op. Res. - International Transactions in Operational Research, vol.22, no.4, pp.773-774, 2015-6-8, 2015
35. Dias,J, Rocha,H, Viana,A, "Special issue on ?Improving Healthcare: new challenges, new approaches?", Intl. Trans. in Op. Res. - International Transactions in Operational Research, vol.22, no.5, pp.949-950, 2015-8-3, 2015

36. Fernandes,P, Fontes,T, Neves,M, Pereira,SR, Bandeira,JM, Roupail,NM, Coelho,MC, "Assessment of Corridors with Different Types of Intersections", Transportation Research Record: Journal of the Transportation Research Board, vol.2503, pp.39-50, 2015-8, 2015
37. Almada Lobo,B, Clark,A, Guimarães,L, Figueira,G, Amorim,P, "Industrial insights into lot sizing and scheduling modeling", Pesquisa Operacional, vol.35, no.3, pp.439-464, 2015
38. Almada-Lobo,B, Clark,A, Guimarães,L, Figueira,G, Amorim,P, "INDUSTRIAL INSIGHTS INTO LOT SIZING AND SCHEDULING MODELING", Pesquisa Operacional - Pesqui. Oper., vol.35, no.3, pp.439-464, 2015-12, 2015

G.2. International Conference Proceedings with scientific referees

1. Sobral,T, Dias,TG, Borges,JL, "Towards a Conceptual Framework for Classifying Visualisations of Data from Urban Mobility Services", EXPLORING SERVICES SCIENCE, IESS 2015, vol.201, pp.228-242, 2015, 2015
2. Ferreira,MC, Dias,TG, "How to Encourage the Use of Public Transport? A Multiservice Approach Based on Mobile Technologies", EXPLORING SERVICES SCIENCE, IESS 2015, vol.201, pp.314-325, 2015, 2015
3. Vaz,CB, Ferreira,AP, "Efficiency Assessment of Wind Farms: a Two-stage Approach", PROCEEDINGS OF THE INTERNATIONAL CONFERENCE OF NUMERICAL ANALYSIS AND APPLIED MATHEMATICS 2014 (ICNAAM-2014), vol.1648, 2015, 2015
4. Alvelos,F, Klimentova,X, Rais,A, Viana,A, "A compact formulation for maximizing the expected number of transplants in kidney exchange programs", MINI EURO CONFERENCE ON IMPROVING HEALTHCARE: NEW CHALLENGES, NEW APPROACHES, vol.616, no.1, pp.012011, 2015-5-22, 2015
5. Seixas,MCB, Cardoso,JCS, Dias,MTG, "The leap motion movement for 2D pointing tasks characterisation and comparison to other devices", PECCS 2015 - 5th International Conference on Pervasive and Embedded Computing and Communication Systems, Proceedings, pp.15-24, 2015
6. Costa,PM, Galvao,T, Falcao e Cunha,JFE, Pitt,J, "How to Support the Design and Development of Interactive Pervasive Environments", 2015 8TH INTERNATIONAL CONFERENCE ON HUMAN SYSTEM INTERACTIONS (HSI), pp.278-284, 2015
7. Carvalho,M, Pinto Varela,T, Barbosa Povia,AP, Amorim,P, Almada Lobo,B, "Optimization of Production Planning and Scheduling in the Ice Cream Industry", 12TH INTERNATIONAL SYMPOSIUM ON PROCESS SYSTEMS ENGINEERING AND 25TH EUROPEAN SYMPOSIUM ON COMPUTER AIDED PROCESS ENGINEERING, PT C, vol.37, pp.2231-2236, 2015, 2015
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9. Costa,V, Fontes,T, Costa,PM, Dias,TG, "Prediction of Journey Destination in Urban Public Transport", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.169-180, 2015, 2015
10. Costa,PM, Galvao,T, Cunha,JFE, Pitt,J, "How to support the design and development of interactive pervasive environments", Proceedings - 2015 8th International Conference on Human System Interaction, HSI 2015, pp.278-284, 2015-6, 2015
11. Ferreira,AP, Vaz,CB, "Performance comparison of wind energy conversion system technologies", 5th International Conference on Clean Electrical Power: Renewable Energy Resources Impact, ICCEP 2015, pp.247-252, 2015-6, 2015
12. Sousa,JFD, Mendes Moreira,J, "Urban Logistics Integrated in a Multimodal Mobility System", IEEE Conference on Intelligent Transportation Systems, Proceedings, ITSC, vol.2015-October, pp.89-94, 2015-9, 2015
13. Costa,V, Fontes,T, Costa,PM, Galvao,T, "How to Predict Journey Destination for Supporting Contextual Intelligent Information Services?", IEEE Conference on Intelligent Transportation Systems, Proceedings, ITSC, vol.2015-October, pp.2959-2964, 2015

14. Pedroso,JP, Tavares,JN, Leite,J, "An algorithm for packing tubes and boxes", Proceedings - CIE 45: 2015 International Conference on Computers and Industrial Engineering, 2015

G.3. Books (Author)

(Void)

G.4. Chapter/Paper in Books

1. Oliveira,R, Camanho,A, Zanella,A, "Eco-efficiency assessment at firm level: An application to the mining sector", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.149-157, 2015
2. Oliveira,BB, Carravilla,MA, Oliveira,JF, Raicar,P, Acácio,D, Ferreira,J, Araújo,P, "Pricing for internet sales channels in car rentals", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.139-147, 2015
3. Vaz,CB, Alves,J, Mendes,I, "Performance assessment of children and youth households", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.237-245, 2015
4. Silva,E, Viães,C, Oliveira,JF, Carravilla,MA, "Integrated cutting and production planning: A case study in a home textile manufacturing company", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.213-220, 2015, 2015
5. Guimarães,L, Figueira,G, Amorim,P, Almada Lobo,B, "Modeling lot sizing and scheduling in practice", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.67-77, 2015
6. Sousa,C, Silva,E, Lopes,M, Ramos,A, "The cutting stock problem: A case study in a manufacturer of pet vivaria", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.221-228, 2015, 2015
7. Hora,J, Dias,TG, Camanho,A, "Improving the robustness of bus schedules using an optimization model", Operations Research and Big Data: IO2015-XVII Congress of Portuguese Association of Operational Research (APDIO), vol.15, pp.79-87, 2015
8. Vaz,CB, Ferreira,, "Efficiency and Productivity Assessment of Wind Farms", Operational Research - CIM Series in Mathematical Sciences, pp.407-424, 2015, 2015
9. Pedroso,JP, Rei,R, "Tree Search and Simulation", Applied Simulation and Optimization, pp.109-131, 2015, 2015

G.5. Publications (Editor)

(Void)

G.6. Other Publications

1. Ostrom,AL, Parasuraman,A, Bowen,DE, Patricio,L, Voss,CA, "Service Research Priorities in a Rapidly Changing Context", JOURNAL OF SERVICE RESEARCH, vol.18, no.2, pp.127-159, MAY, 2015
2. Juan,AA, Faulin,J, Grasman,SE, Rabe,M, Figueira,G, "A review of simheuristics: Extending metaheuristics to deal with stochastic combinatorial optimization problems", OPERATIONS RESEARCH PERPSECTIVES, vol.2, pp.62-72, DEC, 2015
3. Lopes,MA, Almeida,AS, Almada Lobo,B, "Handling healthcare workforce planning with care: where do we stand?", HUMAN RESOURCES FOR HEALTH, vol.13, no.1, MAY 24, 2015

HIGH-ASSURANCE SOFTWARE LABORATORY

A. DESCRIPTION OF THE RESEARCH CENTRE

In its internal organization, the HASLab follows the general model adopted at INESC TEC. It is governed by a Coordinator and a Coordinating Council composed of 3 PhDs, having responsibilities over areas of work and research. At present, the group is coordinated by Rui Carlos Oliveira, and the Coordinating Council includes also Manuel Bernardo Barbosa and Manuel Alcino Cunha.

Project leaders respond to the Coordinating Council in what concerns the execution of projects and meeting financial sustainability goals as well as scientific productivity targets. This Coordinating Council is also responsible for articulating participation of HASLab in the Computer Science cluster, in coordination with the Direction of INESC TEC.

Given the geographic reality of the location of the main HASLab activity (in Braga), the Coordinator of HASLab and its Coordinating Council also hold the responsibility for the management of the pole of INESC TEC at the University of Minho and establishing the necessary relations with its Schools. A specific administrative, secretarial and technical support service system has been put in place, within a framework of agreement with the academic authorities of the University of Minho.

The overarching objectives of HASLab are (1) to consolidate our position as an internationally recognized research lab on high assurance software and (2) to strengthen regional impacts of the focus on high assurance in software design, development, and deployment. They translate to the following concrete goals:

- To extend the activity of HASLab to the later stages of the knowledge-to-value production chain. HASLab currently focuses on the early stages of the knowledge-to-value production chain, mainly, on knowledge production and applied research. The integration in INESC TEC should allow HASLab to strengthen the Development and the Technology Transfer activities and should be measured by an increased participation in collaborative projects with the industry, mainly in the context of European Framework Programmes, as well as by direct development and technology transfer contracts.
- To increase the effectiveness of collaboration within HASLab. Approaching research issues with a comprehensive perspective on high assurance, including software engineering, distributed systems, and information security aspects, enables novel solutions that advantageously compete with proposals that consider each aspect alone. This should be measured by the ability of HASLab to jointly address emerging challenges, such as data management in the cloud, and the new interaction paradigms that arise in the Internet of Things.
- To increase the collaboration with other research groups at INESC TEC, University of Minho and University of Porto. Although HASLab strives for research excellence by specializing on a narrow set of related topics, obtaining a wider societal impact for research depends also on how contributions are integrated to solve problems widely perceived as relevant. HASLab aims to leverage the dual affiliation of most members to INESC TEC and Universities—the majority at E. Eng. / U. Minho, but also present at the Faculty of Engineering and the Faculty of Science at U. Porto—to collaborate with other research groups and overcome this challenge. This should be measured by the participation of HASLab in a large scale effort to address a multi-disciplinary grand challenges such as the smartgrid and health information systems.
- To emphasize high assurance software foundations and technologies in graduate programs. HASLab researchers are involved in Masters and Doctorate level programs at the U. Minho and the U. Porto and the proposed curricula must reflect the awareness of high assurance requirements, theory, and technology. Besides directly participating in research activities, graduates are also ambassadors to the industry, strengthening the impact of HASLab. This should be measured mainly by the graduate students that focus on high assurance software topics in their theses.

B. MAIN ACHIEVEMENTS

The HASLab steadily produces fundamental and applied research that satisfies the quality standards of the top rated journal and conferences (rated A*, the best of the best in the popular computer science CORE venue ranking) in each of its areas of research. In 2015 we have published 32 journal articles and 14 full papers in international conferences rated at least B in the CORE ranking.

Major outcomes of our research in 2015 were:

- In the area of distributed systems, HASLab focused its attention on the research and development of large scale -dependable systems and big data techniques. We highlight three contributions. A journal paper published in JPDC 2015 presented fault-tolerant techniques for large scale aggregation in dynamic networks. A journal survey paper on distributed aggregation protocols was published in IEEE Communications Surveys & Tutorials. A conference paper, published at Middleware 2015, advanced the state of the art in scalable total order algorithms, a key component for building reliable distributed systems.
- The development of formal modeling and verification techniques and tools have been the main focus of the HASLab's activities in software engineering. The full software development cycle was addressed, ranging from the specification and design to the implementation, with contributions published at several key venues. One highlight was the usage of IVY, a tool for specification and verification of interactive systems in the certification process of Nidus, the Newcastle infant dialysis and ultrafiltration system developed at the Royal Victoria Infirmary (RVI) in the UK. The IVY tool was used to analyze the control logic of Nidus, and helped identify potentially problematic behaviors.
- Two contributions to high-profile cryptographic library implementations resulted from novel scientific contributions in the area of information security. In a paper published at IEEE Security & Privacy 2015 a new protocol for privacy-preserving computation in the Cloud was proposed; this protocol was later included in the libsark open source library that is freely available from GitHub. The discovery of an implementation bug and an associated vulnerability in Amazon's (AWS Labs) implementation of TLS, the S2N library, resulted in a contribution to this implementation that eliminated both the bug and vulnerability, as well as a software development methodology that permits reducing the probability of such errors occurring again.
- The SafeCloud EU H2020 project started in 2015. SafeCloud is a multidisciplinary project coordinated by the HASLab that addresses the integrity, security and privacy issues of moving sensitive applications to the Cloud. The HASLab was also present in ICT 2015 to disseminate the research done on FP7 EU project CoherentPaaS.

The HASLab established significant cooperation with other Centres in INESC TEC through projects and proposal submission as well as participation in other cross-Centre activities.

PROJECTS

4 EC-funded projects in 2015 (1 kicked-off in September)
5 CCDR-N (QREN) funded projects completed in 2015
5 FCT-funded projects completed in 2015
2 industry-funded projects completed in 2015
1 industry-funded project ongoing in 2015

PUBLICATIONS

32 papers in international peer-reviewed journals
40 papers in international conferences with peer reviewing (CORE: 3 A*, 2 A, 9 B)

5 PhD thesis
30 MsC thesis

AWARDS

One of the highlights of 2015 was the award of an ERC grant to Alexandra Silva on the topic of the design and programming of complex network systems.

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes						
European Union Programmes			35	306	436	42%
R&D Services and Consulting	6	17	18	16	130	713%
Other R&D sources						
Other external sources					9	
Total	6	17	53	322	575	79%

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	2	11%	16	4%
	National Programmes - QREN				
	National Programmes – P2020				
	National Programmes - PICT	3	17%	27	6%
	European Union Programmes – FP7				
	European Union Programmes – H2020	1	6%	19	4%
	European Union Programmes - Other				
	R&D Services and Consulting - National	11	61%	330	77%
	R&D Services and Consulting – European Union	1	6%	36	8%
	R&D Services and Consulting - International				
	Other R&D sources				
	Other external sources				
	Internal				
Dominant Activity type	Basic Research	9	50%	227	53%
	Applied Research and Development	1	6%	26	6%
	Consulting	8	44%	175	41%
	Technology Transfer				
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	6	33%	82	19%
	Continuation	2	11%	88	21%
	Started and Concluded within the year	3	17%	86	20%
	Concluded	7	39%	172	40%
Total		18		428	

D. SUMMARY OF PUBLICATIONS

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	5	6	11	15	30	32
International conference Proceedings with scientific referees	43	44	48	60	75	40
Books - Author	0	1	0	0	0	0
Chapter in books	0	0	0	0	4	0
Publications (Editor)	1	1	0	2	0	4
Other Publications	0	0	1	9	4	0
Total	49	52	60	86	113	76

E. SUMMARY OF POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	30
Doctoral	5
Total	35

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
SMILES	Carlos Baquero	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START
CoherentPaaS	Rui Carlos Oliveira	RES	PROG - EU	FP7		EU	PAR	2013-10	CONT
Practice	Manuel Barbosa	RES	PROG - EU	FP7		EU	PAR	2013-11	CONT
LeanBigData	Rui Carlos Oliveira	RES	PROG - EU	FP7		EU	PAR	2014-02	CONT
SafeCloud	Rui Carlos Oliveira	RES	PROG - EU	H2020		EU	PROP	2015-09	START
PaaS	Rui Carlos Oliveira	CONS	SERV - NAT				CONT	2013-09	FIN
PaaS2	Rui Carlos Oliveira	CONS	SERV - NAT				CONT	2014-12	FIN
Consultoria	Rui Carlos Oliveira	CONS	SERV - NAT				CONT	2014-01	CONT
RAMiCS	José Nuno Oliveira	CONF	O					2015-09	START-FIN
SMILES	Carlos Baquero	RES	PROG - NAT	NORTE2020		NAT	PROP	2015-07	START

Dominant Activity Type:

RES – Research
 DEV – Development
 CONS - Consulting
 TT - Technology Transfer
 NET - Network
 CONF - Conference
 TRAIN - Advanced Training
 INC - Incubation
 O - Other

Source:

PROG – NAT – National Programmes
 PROG – EU – European Union Programmes
 SERV - NAT - Supply of Services - National
 SERV - EU - Supply of Services - European Union
 SERV - INT - Supply of Services - International
 ORD - Other R&D Services
 O - Other External Services
 INT - Internal

Type:

IND – Individual Project
 NAT - National Cooperation
 EU - European Union Cooperation (EU+Associated Countries)
 INT - Internal Cooperation

Role INESCP:

PROP - Proponent
 PAR - Partner
 CONT - Prime Contractor
 SUB - Subcontractor
 MEMB - Member
 O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

- Sanchez,A, Oliveira,N, Barbosa,LS, Henriques,P, "A perspective on architectural re-engineering", SCIENCE OF COMPUTER PROGRAMMING, vol.98, pp.764-784, FEB 1, 2015
- Albuquerque,D, Cafeo,B, Garcia,A, Barbosa,S, Abrahao,S, Ribeiro,A, "Quantifying usability of domain-specific languages: An empirical study on software maintenance", JOURNAL OF SYSTEMS AND SOFTWARE, vol.101, pp.245-259, MAR, 2015
- Cunha,A, Garis,A, Riesco,D, "Translating between Alloy specifications and UML class diagrams annotated with OCL", SOFTWARE AND SYSTEMS MODELING, vol.14, no.1, pp.5-25, FEB, 2015
- Cunha,J, Fernandes,JP, Mendes,J, Saraiva,J, "Embedding, Evolution, and Validation of Model-Driven Spreadsheets", IEEE TRANSACTIONS ON SOFTWARE ENGINEERING, vol.41, no.3, pp.241-263, MAR, 2015
- Peris,RJ, Martínez,MP, Kemme,B, Brondino,I, Pereira,JO, Vilaça,R, Cruz,F, Oliveira,R, Ahmad,MY, "CumuloNimbo: A Cloud Scalable Multi-tier SQL Database", IEEE Data Eng. Bull., vol.38, no.1, pp.73-83, 2015-03-25, 2015

6. Abreu,R, Hofer,B, Perez,A, Wotawa,F, "Using constraints to diagnose faulty spreadsheets", SOFTWARE QUALITY JOURNAL, vol.23, no.2, pp.297-322, JUN, 2015
7. Cunha,J, Fernandes,JP, Mendes,J, Saraiva,J, "Spreadsheet engineering", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.8606, pp.246-299, 2015-04-21, 2015
8. Jesus,P, Baquero,C, Almeida,PS, "A Survey of Distributed Data Aggregation Algorithms", IEEE COMMUNICATIONS SURVEYS AND TUTORIALS, vol.17, no.1, pp.381-404, 2015, 2015
9. Hofer,B, Perez,A, Abreu,R, Wotawa,F, "On the empirical evaluation of similarity coefficients for spreadsheets fault localization", AUTOMATED SOFTWARE ENGINEERING, vol.22, no.1, pp.47-74, MAR, 2015
10. Martins,P, Fernandes,JP, Saraiva,J, "Zipper-based modular and deforested computations", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.8606, pp.407-427, 2015-04-21, 2015
11. Cunha,J, Fernandes,JP, Mendes,J, Pereira,R, Saraiva,J, "Design and implementation of queries for model-driven spreadsheets", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.8606, pp.459-478, 2015-04-21, 2015
12. Jesus,P, Baquero,C, Almeida,PS, "Flow updating: Fault-tolerant aggregation for dynamic networks", JOURNAL OF PARALLEL AND DISTRIBUTED COMPUTING, vol.78, pp.53-64, APR, 2015
13. Macedo,HD, Oliveira,JN, "A linear algebra approach to OLAP", FORMAL ASPECTS OF COMPUTING, vol.27, no.2, pp.283-307, MAR, 2015
14. Madeira,A, Martins,MA, Barbosa,LS, Hennicker,R, "Refinement in hybridised institutions", FORMAL ASPECTS OF COMPUTING, vol.27, no.2, pp.375-395, MAR, 2015
15. Harrison,MD, Campos,JC, Masci,P, "Reusing models and properties in the analysis of similar interactive devices", Innovations in Systems and Software Engineering, vol.11, no.2, pp.95-111, 2013-4-3, 2015
16. Cunha,J, Fernandes,JP, Pereira,R, Saraiva,J, "Querying Spreadsheets: An Empirical Study", CoRR, vol.abs/1502.07948, 2015-03-02, 2015
17. Maia,P, Mendes,J, Cunha,J, Rebêlo,H, Saraiva,J, "Towards the Design and Implementation of Aspect-Oriented Programming for Spreadsheets", CoRR, vol.abs/1503.03463, 2015-04-09, 2015
18. Pinto,P, Abreu,R, Cardoso,JMP, "Fault Detection in C Programs using Monitoring of Range Values: Preliminary Results", CoRR, vol.abs/1505.01878, 2015-06-01, 2015
19. Pedro,AdM, Pereira,D, Pinho,LM, Pinto,JS, "Logic-based schedulability analysis for compositional hard real-time embedded systems", SIGBED Review, vol.12, no.1, pp.56-64, 2015-04-25, 2015
20. Macedo,N, Tiago,J, Cunha,A, "A Feature-based Classification of Model Repair Approaches", CoRR, vol.abs/1504.03947, 2015-05-02, 2015
21. Castro,NC, Azevedo,PJ, "Automatically estimating iSAX parameters", INTELLIGENT DATA ANALYSIS, vol.19, no.3, pp.581-595, 2015-11-03, 2015
22. Rodrigues,F, Oliveira,N, Barbosa,LS, "Towards an engine for coordination-based architectural reconfigurations", COMPUTER SCIENCE AND INFORMATION SYSTEMS, vol.12, no.2, pp.607-634, JUN, 2015
23. Murta,D, Oliveira,JN, "A study of risk-aware program transformation", SCIENCE OF COMPUTER PROGRAMMING, vol.110, pp.51-77, OCT 15, 2015
24. Oliveira,N, Barbosa,LS, "Reasoning about software reconfigurations: The behavioural and structural perspectives", SCIENCE OF COMPUTER PROGRAMMING, vol.110, pp.78-103, OCT 15, 2015
25. Mendes Moreira,J, Cunha,A, Macedo,N, "An ORCID based synchronization framework for a national CRIS ecosystem", F1000Research, vol.4, 2015-7-6, 2015

26. Neves,R, Barbosa,LS, Hofmann,D, Martins,MA, "Continuity as a computational effect", CoRR, vol.abs/1507.03219, 2015-08-02, 2015
27. Magalhães,A, Azevedo,PJ, "Contrast set mining in temporal databases", Expert Systems, vol.32, no.3, pp.435-443, 2014-8-29, 2015
28. Sanchez,A, Madeira,A, Barbosa,LS, "On the verification of architectural reconfigurations", COMPUTER LANGUAGES SYSTEMS & STRUCTURES, vol.44, pp.218-237, DEC, 2015
29. Lourenço,CB, Lamraoui,SM, Nakajima,S, Pinto,JS, "Studying Verification Conditions for Imperative Programs", ECEASST, vol.72, 2015
30. Zawirski,M, Baquero,C, Bieniusa,A, Preguiça,NM, Shapiro,M, "Eventually Consistent Register Revisited", CoRR, vol.abs/1511.05010, 2015
31. Oliveira,N, Barbosa,LS, "Self-adaptation by coordination-targeted reconfigurations", J. Software Eng. R&D, vol.3, no.1, pp.6, 2015-5-28, 2015
32. Almeida,JB, Barbosa,M, Barthe,G, Dupressoir,F, "Verifiable side-channel security of cryptographic implementations: constant-time MEE-CBC", IACR Cryptology ePrint Archive, vol.2015, pp.1241, 2015

G.2. International Conference Proceedings with scientific referees

1. Sanchez,A, Barbosa,LS, Madeira,A, "Modelling and Verifying Smell-Free Architectures with the ARCHERY Language", SOFTWARE ENGINEERING AND FORMAL METHODS, SEFM 2014, vol.8938, pp.147-163, 2015-02-05, 2015
2. Goncalves,R, Saraiva,J, Belo,O, "Defining energy consumption plans for data querying processes", Proceedings - 4th IEEE International Conference on Big Data and Cloud Computing, BDCloud 2014 with the 7th IEEE International Conference on Social Computing and Networking, SocialCom 2014 and the 4th International Conference on Sustainable Computing and C, pp.641-647, 2015-03-18, 2015
3. Madeira,A, Neves,R, Martins,MA, Barbosa,LS, "A Dynamic Logic for Every Season", FORMAL METHODS: FOUNDATIONS AND APPLICATIONS, SBMF 2014, vol.8941, pp.130-145, 2015-01-07, 2015
4. Neves,R, Martins,MA, Barbosa,LS, "Completeness and Decidability Results for Hybrid(ised) Logics", FORMAL METHODS: FOUNDATIONS AND APPLICATIONS, SBMF 2014, vol.8941, pp.146-161, 2015-01-07, 2015
5. Jorge,T, Maia,F, Matos,M, Pereira,J, Oliveira,R, "Practical evaluation of large scale applications", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9038, pp.124-137, 2015-05-05, 2015
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8. Guimaraes,P, Pereira,J, "X-Ray: Monitoring and analysis of distributed database queries", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9038, pp.80-93, 2015, 2015
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11. Madeira,A, Neves,R, Martins,MA, Barbosa,LS, "A Logic for Robotics?", PROCEEDINGS OF THE INTERNATIONAL CONFERENCE OF NUMERICAL ANALYSIS AND APPLIED MATHEMATICS 2014 (ICNAAM-2014), vol.1648, 2015, 2015
12. Sanchez,A, Barbosa,LS, Riesco,D, "Specifying Structural Constraints of Architectural Patterns in the ARCHERY Language", PROCEEDINGS OF THE INTERNATIONAL CONFERENCE OF NUMERICAL ANALYSIS AND APPLIED MATHEMATICS 2014 (ICNAAM-2014), vol.1648, 2015, 2015
13. Macedo,N, Cunha,A, Guimaraes,T, "Exploring Scenario Exploration", FUNDAMENTAL APPROACHES TO SOFTWARE ENGINEERING, FASE 2015, vol.9033, pp.301-315, 2015-04-07, 2015
14. Bahsoun,JP, Guerraoui,R, Shoker,A, "Making BFT Protocols Really Adaptive", 2015 IEEE International Parallel and Distributed Processing Symposium, IPDPS 2015, Hyderabad, India, May 25-29, 2015, pp.904-913, 2015-07-23, 2015
15. Barbosa,M, Farshim,P, "The Related-Key Analysis of Feistel Constructions", FAST SOFTWARE ENCRYPTION, FSE 2014, vol.8540, pp.265-284, 2015, 2015
16. Backes,M, Barbosa,M, Fiore,D, Reischuk,RM, "ADSNARK: Nearly practical and privacy-preserving proofs on authenticated data", Proceedings - IEEE Symposium on Security and Privacy, vol.2015-July, pp.271-286, 2015-07-24, 2015
17. Almeida,D, Campos,JC, Saraiva,J, Silva,JC, "Towards a catalog of usability smells", Proceedings of the ACM Symposium on Applied Computing, vol.13-17-April-2015, pp.175-181, 2015-07-21, 2015
18. Zhu,Z, Ko,HS, Martins,P, Saraiva,J, Hu,Z, "BiYacc: Roll your parser and reflective printer into one", CEUR Workshop Proceedings, vol.1396, pp.43-50, 2015
19. Pedro,AD, Pereira,D, Pinho,LM, Pinto,JS, "Monitoring for a Decidable Fragment of MTL-integral", RUNTIME VERIFICATION, RV 2015, vol.9333, pp.169-184, 2015, 2015
20. Schiavoni,V, Rivière,E, Sutra,P, Felber,P, Matos,M, Oliveira,R, "TOPiCo: Detecting most frequent items from multiple high-rate event streams", DEBS 2015 - Proceedings of the 9th ACM International Conference on Distributed Event-Based Systems, pp.58-67, 2015
21. Rubin,J, Eldardiry,H, Abreu,R, Ahern,S, Du,H, Pattekar,A, Bobrow,DG, "Towards a mobile and wearable system for predicting panic attacks", Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing, UbiComp 2015, Osaka, Japan, September 7-11, 2015, pp.529-533, 2015-09-11, 2015
22. Abreu,R, Erdogmus,H, Perez,A, "CodeAware: Sensor-Based Fine-Grained Monitoring and Management of Software Artifacts", 37th IEEE/ACM International Conference on Software Engineering, ICSE 2015, Florence, Italy, May 16-24, 2015, Volume 2, pp.551-554, 2015-09-08, 2015
23. Passos,LS, Abreu,R, Rossetti,RJF, "Spectrum-based fault localisation for multi-agent systems", IJCAI International Joint Conference on Artificial Intelligence, vol.2015-January, pp.1134-1140, 2015
24. Abreu,R, Außerlechner,S, Hofer,B, Wotawa,F, "Testing for Distinguishing Repair Candidates in Spreadsheets - the Mussco Approach", Testing Software and Systems - 27th IFIP WG 6.1 International Conference, ICTSS 2015, Sharjah and Dubai, United Arab Emirates, November 23-25, 2015, Proceedings, vol.9447, pp.124-140, 2015-11-09, 2015
25. Campos,J, Fraser,G, Arcuri,A, Abreu,R, "Continuous test generation on Guava", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9275, pp.228-234, 2015-07-28, 2015
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27. Teixeira,JF, Couto,M, "Automatic Distinction of Fernando Pessoa's Heteronyms", PROGRESS IN ARTIFICIAL INTELLIGENCE, vol.9273, pp.783-788, 2015, 2015

28. Abade,T, Campos,JC, Moreira,R, Silva,CCL, Silva,JL, "Immersiveness of Ubiquitous Computing Environments Prototypes: A Case Study", DISTRIBUTED, AMBIENT, AND PERVASIVE INTERACTIONS, vol.9189, pp.237-248, 2015, 2015
29. Oliveira,JN, "Metaphorisms in Programming", RELATIONAL AND ALGEBRAIC METHODS IN COMPUTER SCIENCE (RAMICS 2015), vol.9348, pp.171-190, 2015
30. Campos,JC, Abade,T, Silva,JL, Harrison,MD, "Supporting the design of an ambient assisted living system using virtual reality prototypes", Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol.9455, pp.49-61, 2015, 2015
31. Almeida,PS, Shoker,A, Baquero,C, "Efficient State-Based CRDTs by Delta-Mutation", Networked Systems - Third International Conference, NETYS 2015, Agadir, Morocco, May 13-15, 2015, Revised Selected Papers, vol.9466, pp.62-76, 2015
32. Shoker,A, Almeida,PS, Baquero,C, "Exactly-Once Quantity Transfer", 34th IEEE Symposium on Reliable Distributed Systems Workshop, SRDS 2015 Workshop, Montreal, QC, Canada, September 28 - October 1, 2015, pp.68-73, 2015
33. Harrison,M, Campos,J, Masci,P, Curzon,P, "Templates as heuristics for proving properties of medical devices", Proceedings of the 5th EAI International Conference on Wireless Mobile Communication and Healthcare - "Transforming healthcare through innovations in mobile and wireless technologies", 2015, 2015
34. Matos,M, Mercier,H, Felber,P, Oliveira,R, Pereira,JO, "EpTO: An Epidemic Total Order Algorithm for Large-Scale Distributed Systems", Proceedings of the 16th Annual Middleware Conference, Vancouver, BC, Canada, December 07 - 11, 2015, pp.100-111, 2015, 2015
35. Lima,R, Baquero,C, Miranda,H, "Adaptive Broadcast Cancellation Query Mechanism for Unstructured Networks", 9th International Conference on Next Generation Mobile Applications, Services and Technologies, NGMAST 2015, Cambridge, United Kingdom, September 9-11, 2015, pp.176-181, 2015
36. Cruz,L, Rubin,J, Abreu,R, Ahern,S, Eldardiry,H, Bobrow,DG, "A wearable and mobile intervention delivery system for individuals with panic disorder", Proceedings of the 14th International Conference on Mobile and Ubiquitous Multimedia, Linz, Austria, November 30 - December 2, 2015, pp.175-182, 2015
37. Abreu,R, Bobrow,DG, Eldardiry,H, Feldman,A, Hanley,J, Honda,T, Kleer,Jd, Perez,A, Archer,D, Burke,D, "Diagnosing Advanced Persistent Threats: A Position Paper", Proceedings of the 26th International Workshop on Principles of Diagnosis (DX-2015) co-located with 9th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (Safeprocess 2015), Paris, France, August 31 - September 3, 2015., vol.1507, pp.193-200, 2015
38. Honda,T, Liao,L, Eldardiry,H, Saha,B, Abreu,R, Pavel,R, Iverson,J, "Device Health Estimation by Combining Contextual Control Information with Sensor Data", Proceedings of the 26th International Workshop on Principles of Diagnosis (DX-2015) co-located with 9th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (Safeprocess 2015), Paris, France, August 31 - September 3, 2015., vol.1507, pp.209-216, 2015
39. Daniels,W, Proença,J, Matthys,N, Joosen,W, Hughes,D, "Tomography: lowering management overhead for distributed component-based applications", Proceedings of the 2nd Workshop on Middleware for Context-Aware Applications in the IoT, M4IoT@Middleware 2015, Vancouver, BC, Canada, December 7-11, 2015, pp.13-18, 2015
40. Couto,M, Cunha,J, Fernandes,JP, Pereira,R, Saraiva,J, "GreenDroid: A tool for analysing power consumption in the android ecosystem", 2015 IEEE 13th International Scientific Conference on Informatics, INFORMATICS 2015 - Proceedings, pp.73-78, 2015

G.3. Books (Author)

(Void)

G.4. Chapter/paper in Books

(Void)

G.5. Publications (Editor)

1. Cámara,J, Proença,J, "Proceedings 13th International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems, FOCLASA 2014, Rome, Italy, 6th September 2014", FOCLASA, vol.175, 2015-04-10, 2015
2. Baquero,C, Serafini,M, "Proceedings of the First Workshop on Principles and Practice of Consistency for Distributed Data, PaPoC@EuroSys 2015, Bordeaux, France, April 21, 2015", PaPoC@EuroSys, 2015
3. Bozorgzadeh,E, Cardoso,JMP, Abreu,R, Memik,SO, "13th IEEE International Conference on Embedded and Ubiquitous Computing, EUC 2013, Porto, Portugal, October 21-23, 2015", EUC, 2015
4. Proença,J, Tivoli,M, "Proceedings 14th International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems, FOCLASA 2015, Madrid, Spain, 5th September 2015", FOCLASA, vol.201, 2015

G.6. Other Publications

1. Silva, Alexandra; Goncharov, Sergey; Milius, Stefan, Towards a Coalgebraic Chomsky Hierarchy. CoRR abs/1401.5277
2. Silva, Alexandra; Bonchi, Filippo; Milius, Stefan; Zanasi, Fabio, How to Kill Epsilons with a Dagger – A Coalgebraic Take on Systems with Algebraic Label Structure. CoRR abs/1402.4062
3. AlmeidaA, Paulo Sérgio; Shoker, Ali; Baquero, Carlos, Efficient Stat- Based CRDTs by Delta- Mutation. CoRR abs/1410.2803
4. Campos, Filipe; Pereira, José Orlando, Improving the Scalability of DPWS- Based Networked Infrastructures. CoRR abs/1407.8546

RESEARCH CENTRE IN REAL-TIME COMPUTING SYSTEMS

Since 2015, CISTER has become an independent R&D Unit, although still linked to INESC TEC in the context of the Associated Laboratory. For this reason, activity indicators are reported in this part of the annual report, but are not integrated with other Centres that constitute INESC TEC R&D Unit".

C. SUMMARY OF PROJECTS

Evolution of annual income from projects

Source of Funding	Total Income (k€)					Variation 2014 - 2015
	2011	2012	2013	2014	2015	
National Programmes	245	541	339	883	726	-157
European Union Programmes	64	56	366	65	295	+230
R&D Services and Consulting						
Other R&D sources						
Other external sources						
Total	309	597	705	948	1.021	+73

Number of projects and income in 2015

Project Typology		Number of projects		Projects income	
		No.	Distribution	Total (k€)	Distribution
Source of Funding	National Programmes - FCT	5	31%	190	19%
	National Programmes - QREN	3	19%	303	30%
	National Programmes – P2020				
	National Programmes - PICT				
	European Union Programmes – FP7	1	6%	109	10%
	European Union Programmes – H2020	2	13%	71	7%
	European Union Programmes - Other	5	31%	348	34%
	R&D Services and Consulting - National				
	R&D Services and Consulting – European Union				
	R&D Services and Consulting - International				
	Other R&D sources				
	Other external sources				
	Internal				
Dominant Activity type	Basic Research				
	Applied Research and Development				
	Consulting				
	Technology Transfer				
	Network				
	Conference				
	Advanced Training				
	Incubation				
	Other				
Execution Status	Started	2	13%		
	Continuation	5	31%		
	Started and Concluded within the year	-	-		
	Concluded	9	56%		
Total		16		1.021	

D. PUBLICATIONS BY MEMBERS OF THE UNIT

Summary of recent publications

Type of Publication	Year					
	2010	2011	2012	2013	2014	2015
Papers in International Journals with scientific referees	7	8	8	9	23	32
International Conference Proceedings with scientific referees	27	38	31	41	34	31
Books - Author			2	2	1	0
Chapter in books				2	2	2
Publications (Editor)					1	
Other Publications					4	7
Total	34	46	41	54	65	72

E. SUMMARY POST-GRADUATION DISSERTATIONS SUPERVISED BY MEMBERS OF THE CENTRE

Dissertations concluded in 2015

Type	Number
Master	2
Doctoral	5
Total	7

F. LIST OF PROJECTS

Short Name	Leader	Dominant Activity Type	Funding			Cooperation		Execution	
			Source	Programme	Project Typology	Type	Role INESCP	Start	Status
AVIACC	CISTER	RES/DEV	PROG – NAT	FCT	NAT	NAT	-	2012-05	FIN
ENCOURAGE	CISTER	RES/DEV	PROG – NAT/EU	ARTEMIS /FCT	NAT/EU	NAT/EU	-	2011-06	FIN
REGAIN	CISTER	RES/DEV	PROG – NAT	FCT	NAT	NAT	-	2012-04	FIN
SMARTS	CISTER	RES/DEV	PROG – NAT	FCT	NAT	NAT	-	2012-04	FIN
SMARTSKIN	CISTER	RES/DEV	PROG – NAT	FCT	NAT	INT	-	2012-03	FIN
PATTERN	CISTER	RES/DEV	PROG – NAT	FCT	NAT	NAT	-	2013-04	FIN
CARCODE	CISTER	RES/DEV	PROG – NAT	QREN-(ADI)	NAT/EU	NAT/EU	-	2013-07	FIN
BEST-CASE	CISTER	RES/DEV	PROG – NAT	QREN (CCDR-N) / FCT	NAT	NAT	-	2013-01	FIN
V-SIS	CISTER	RES/DEV	PROG – NAT	QREN-(ADI)	NAT/EU	NAT/EU	-	2014-01	FIN
P-SOCRATES	CISTER	RES/DEV	PROG – EU	FP7	EU	EU	-	2013-10	CONT
ARROWHEAD	CISTER	RES/DEV	PROG – NAT/EU	ARTEMIS /FCT	NAT/EU	NAT/EU	-	2013-03	CONT
CONCERTO	CISTER	RES/DEV	PROG – NAT/EU	ARTEMIS /FCT	NAT/EU	NAT/EU	-	2013-05	CONT
EMC2	CISTER	RES/DEV	PROG – NAT/EU	ARTEMIS /FCT	NAT/EU	NAT/EU	-	2014-04	CONT
DEWI	CISTER	RES/DEV	PROG – NAT/EU	ARTEMIS /FCT	NAT/EU	NAT/EU	-	2014-03	CONT
MANTIS	CISTER	RES/DEV	PROG – NAT/EU	ECSEL (H2020)	NAT/EU	NAT/EU	-	2015-01	START
ENERGAWARE	CISTER	RES/DEV	PROG – EU	H2020	EU	EU	-	2015-05	START

Dominant Activity Type:

RES – Research
DEV – Development
CONS - Consulting
TT - Technology Transfer
NET - Network
CONF - Conference
TRAIN - Advanced Training
INC - Incubation
O - Other

Source:

PROG – NAT – National Programmes
PROG – EU – European Union Programmes
SERV - NAT - Supply of Services - National
SERV - EU - Supply of Services - European Union
SERV - INT - Supply of Services - International
ORD - Other R&D Services
O - Other External Services
INT - Internal

Type:

IND – Individual Project
NAT - National Cooperation
EU - European Union Cooperation (EU+Associated Countries)
INT - Internal Cooperation

Role INESCP:

PROP - Proponent
PAR - Partner
CONT - Prime Contractor
SUB - Subcontractor
MEMB - Member
O - Other

G. LIST OF PUBLICATIONS

G.1. International Journals with scientific referees

- Severino, R, Ullah, S, Tovar, E, "A Cross-layer QoS Management Framework for ZigBee Cluster-Tree Networks", Telecommunication Systems (Telecom Syst), Article No 4, Springer. 30, Dec, 2015, Volume 60. DOI:10.1007/s11235-015-0128-0
- Garibay-Martínez, R, Nelissen, G, Ferreira, L, Pinho, L, "Task partitioning and priority assignment for distributed hard real-time systems", Journal of Computer and System Sciences (JCSS), Elsevier. Dec 2015, Volume 81, Issue 8, pp 1542-1555. DOI:10.1016/j.jcss.2015.05.005

3. Barros, A, Pinho, L, Yomsi, P, "Non-preemptive and SRP-based fully-preemptive scheduling of real-time Software Transactional Memory", *Journal of Systems Architecture (JSA)*, Elsevier. 26, Nov, 2015, Volume 61, Issue 10, pp 553-566. DOI:10.1016/j.sysarc.2015.07.008
4. Pinho, L, Nélis, V, Yomsi, P, Quiñones, E, Bertogna, M, Burgio, P, Marongiu, A, Scordino, C, Gai, P, Ramponi, M, Madiak, M, "P-SOCRATES: A parallel software framework for time-critical many-core systems", *Microprocessors and Microsystems (MICPRO)*, Elsevier. Nov 2015, Volume 39, Issue 8, pp 1190-1203. DOI:10.1016/j.micpro.2015.06.004
5. Gaddoura, O, Koubâa, A, Abid, M, "Quality-of-service aware routing for static and mobile IPv6-based low-power and lossy sensor networks using RPL", *Ad Hoc Networks (AD HOC NETW)*, Elsevier. Oct 2015, Volume 33, pp 233-256. DOI:10.1016/j.adhoc.2015.05.009
6. Kumar, N, Singh, J, Bali, R, Misra, S, Ullah, S, "An intelligent clustering scheme for distributed intrusion detection in vehicular cloud computing", *Cluster Computing*, Springer. Sep 2015, Volume 18, Issue 3, pp 1263-1283. DOI:10.1007/s10586-015-0463-7
7. Awan, M, Yomsi, P, Nelissen, G, Petters, S, "Energy-aware Task Mapping onto Heterogeneous Platforms Using DVFS and Sleep States", *Real-Time Systems (RTSJ)*, Springer. 28, Jul, 2015, Volume 52, Issue 1. DOI:10.1007/s11241-015-9236-x
8. Awan, M, Petters, S, "Intra-Task Device Scheduling for Real-Time Embedded Systems", *Journal of Systems Architecture (JSA)*, Elsevier. 1, Jul, 2015, Volume 61, Issue 8, pp 321-340. DOI:doi:10.1016/j.sysarc.2015.07.001
9. Ammar, A, Bennaceur, H, Châari, I, Koubâa, A, Alajlan, M, "Relaxed Dijkstra and A* with linear complexity for robot path planning problems in large-scale grid environments", *Soft Computing (SOFT COMPUT)*, Springer. Jul 2015, pp 1-23. DOI:10.1007/s00500-015-1750-1
10. Ferreira, L, Pinho, L, Albano, M, Teixeira, C, "Adaptive offloading for infotainment systems", *SIGBED Review*, ACM. Jun 2015, Volume 12, Issue 3, pp 19-23. DOI:10.1145/2815482.2815485
11. Nikolic, B, Petters, S, "Real-Time Application Mapping for Many-Cores Using a Limited Migrative Model", *Real-Time Systems (RTS)*, Springer. Jun 2015, Volume 51, Issue 3, pp 314-357. U.S.A. DOI:10.1007/s11241-014-9217-5
12. Jafri, S, Daneshtalab, M, Hemani, A, Abbas, N, Awan, M, Plosila, J, "TEA: Timing and Energy Aware compression architecture for Efficient Configuration in CGRAs", *Microprocessors and Microsystems (MICPRO)*, Elsevier. 23, May, 2015, Volume 39, Issue November 2015, pp 973-986. DOI:doi:10.1016/j.micpro.2015.05.002
13. Hayajneh, T, Ullah, S, Mohd, B, Balagani, K, "An Enhanced WLAN Security System with FPGA Implementation for Multimedia Applications", *Systems Journal*, IEEE. 8, May, 2015. DOI:10.1109/JSYST.2015.2424702
14. Hayajneh, T, Almashaqbeh, G, Ullah, S, "A Green Approach for Selfish Misbehavior Detection in 802.11-Based Wireless Networks", *Mobile Networks and Applications*, Springer. May 2015, Volume 20, Issue 5, pp 623-635. DOI:10.1007/s11036-015-0605-4
15. Pereira, D, Moreira, N, Sousa, S, "Deciding Kleene Algebra Terms Equivalence in Coq", *Journal of Logical and Algebraic Methods in Programming (JLAMP)*, Elsevier. May 2015, Volume 84, Issue 3, pp 377-401. DOI:10.1016/j.jlamp.2014.12.004
16. Alam, M, Albano, M, Radwan, A, Rodriguez, J, "CANDi: context-aware node discovery for short-range cooperation", *Transactions on Emerging Telecommunication Technologies (ETT)*, Wiley. May 2015, Volume 26, Issue 5, pp 861-875. Canada. DOI:10.1002/ett.2763
17. Caldeira, J, Rodrigues, J, Lorenz, P, Ullah, S, "Impact of sensor nodes scaling and velocity on handover mechanisms for healthcare wireless sensor networks with mobility support", *Computers in Industry*, Elsevier. May 2015, Volume 69, pp 92-104. DOI:doi:10.1016/j.compind.2014.09.002
18. Davis, R, Burns, A, Marinho, J, Nélis, V, Petters, S, Bertogna, M, "Global and Partitioned Multiprocessor Fixed Priority Scheduling with Deferred Pre-emption", *Transactions on Embedded Computing Systems*

- Special Issue on Embedded Platforms for Crypto and Regular Papers (TECS), Article No 47, ACM. DOI:10.1145/2739954
- 19. Baccour, N, Koubâa, A, Youssef, H, Alves, M, "Reliable Link Quality Estimation in Low-power Wireless Networks and its impact on Tree-routing", Ad Hoc Networks, Elsevier. Apr 2015, Volume 27, pp 1-25. DOI:10.1016/j.adhoc.2014.11.011
- 20. Fotouhi, H, Moreira, D, Alves, M, "mRPL: Boosting mobility in the Internet of Things", Journal on Ad Hoc Networks, Elsevier. Mar 2015, Volume 26, pp 17-35. DOI:10.1016/j.adhoc.2014.10.009
- 21. Islam, S, Ullah, S, Lloret, J, Ullah, N, Kwak, K, "SIR performance evaluation of MB-OFDM UWB system with residual timing offset", Electronics Letters, IET. 26, Feb, 2015, Volume 51, Issue 5, pp 427-429. DOI:10.1049/el.2014.3967
- 22. Albano, M, Chessa, S, "Replication vs Erasure Coding in Data Centric Storage for Wireless Sensor Networks", Computer Networks (COMNET), Elsevier. 11, Feb, 2015, Volume 77, pp 42-55. DOI:10.1016/j.comnet.2014.11.018
- 23. Albano, M, Ferreira, L, Pinho, L, "Convergence of Smart Grid ICT architectures for the last mile", Transactions on Industrial Informatics (TII), IEEE. Feb 2015, Volume 11, Issue 1, pp 187-197. DOI:10.1109/TII.2014.2379436
- 24. Ullah, S, Li, C, "Energy-efficient MAC protocols for WBANs: Opportunities and challenges", Telecommunication Systems, Springer. Feb 2015, Volume 58, Issue 2, pp 109-110. DOI:10.1007/s11235-014-9896-1
- 25. Albano, M, Ferreira, L, Pinho, L, Alkhawaja, A, "Message-oriented middleware for smart grids", Computer Standards and Interfaces, Elsevier. Feb 2015, Volume 38, pp 133-143. DOI:10.1016/j.csi.2014.08.002
- 26. Pedro, A, Pereira, D, Pinho, L, Pinto, J, "Logic-based schedulability analysis for compositional hard real-time embedded systems", SIGBED Review (SIGBED Rev.), ACM. Feb 2015, Volume 12, Issue 1, pp 56-64. DOI:10.1145/2752801.2752808
- 27. Nogueira, L, Coelho, J, "Passive Fault-Tolerance Management in Component-based Embedded Systems", Computing and Informatics (JCAI), Slovak Academy of Sciences. 2015, Volume 35, Issue 1, pp 23-44.
- 28. Serna, M, Casado, R, Bermudez, A, Pereira, N, Tennina, S, "Distributed Forest Fire Monitoring using Wireless Sensor Networks", International Journal of Distributed Sensor Networks (IJDSN), Article ID 964564. 2015, Volume 2015, pp 1-18. DOI:10.1155/2015/964564
- 29. Dasari, D, Nélis, V, Åkesson, B, "A framework for memory contention analysis in multi-core platforms", Real-Time Systems (RTS), Springer. 2015, Volume 52, Issue 1, pp 1-51. U.S.A. DOI:10.1007/s11241-015-9229-9
- 30. Pereira, N, Tennina, S, Loureiro, J, Severino, R, Saraiva, B, Santos, M, Pacheco, F, Tovar, E, "A Microscope for the Data Center", International Journal of Sensor Networks (IJSNet), Inderscience. 2015, Volume 18, Issue 3/4, pp 193-203. DOI:10.1504/IJSNET.2015.070400
- 31. Minaeva, A, Åkesson, B, Hanzálek, Z, Šuchaa, P, "Scalable and Efficient Configuration of Time-Division Multiplexed Resources", Journal of Systems and Software (jss), Elsevier. 2015, Volume 113, pp 44-58. DOI:doi:10.1016/j.jss.2015.11.019
- 32. Vahabi, M, Gupta, V, Albano, M, R., R, Tovar, E, "Feature Extraction in Densely Sensed Environments: Extensions to Multiple Broadcast Domains", International Journal of Distributed Sensor Networks (IJDSN), Article ID 457537, Hindawi. 2015, Volume 2015, 21 pages. DOI:10.1155/2015/457537

G.2. International Conference Proceedings with scientific referees

1. Maxim, D, Soboczenski, F, Bate, I, Tovar, E, "Study of the Reliability of Statistical Timing Analysis for Real-Time Systems", 23rd International Conference on Real-Time Networks and Systems (RTNS 2015). 4 to 6, Nov, 2015, Main Track. Lille, France

2. Altmeyer, S, Davis, R, Indrusiak, L, Maiza, C, Nélis, V, Reineke, J, "A Generic and Compositional Framework for Multicore Response Time Analysis", 23rd International Conference on Real-Time Networks and Systems (RTNS 2015). 4 to 6, Nov, 2015, Main Track. Lille, France
3. Esper, A, Nelissen, G, Nélis, V, Tovar, E, "How realistic is the mixed-criticality real-time system model?", 23rd International Conference on Real-Time Networks and Systems (RTNS 2015). 4 to 6, Nov, 2015, Main Track. Lille, France
4. Burmyakov, A, Bini, E, Tovar, E, "An Exact Schedulability Test for Global FP Using State Space Pruning", 23rd International Conference on Real-Time Networks and Systems (RTNS 2015). 4 to 6, Nov, 2015, Main Track. Lille, France
5. Santos_Jr, J, Lima, G, Bletsas, K, "Considerations on the Least Upper Bound for Mixed-Criticality Real-Time Systems", 5th Brazilian Symposium on Computing Systems Engineering, SBESC 2015 (SBESC 2015). 3 to 6, Nov, 2015. Foz do Iguaçu, Brasil
6. Li, Y, Salunkhe, H, Bastos, J, Moreira, O, Åkesson, B, Goossens, K, "Mode-Controlled Data-Flow Modeling of Real-Time Memory Controllers", 13th IEEE Symposium on Embedded Systems for Real-Time Multimedia (ESTIMedia 2015). 8 to 9, Oct, 2015. Amsterdam, Netherlands.
7. Robles, R, Lavendis, E, "Performance Model for MRC Receivers with Adaptive Modulation and Coding in Rayleigh Fading Correlated Channels with Imperfect CSIT", RTUWO Advances in Wireless and Optical Communications 2015 (RTUWO2015). 5 to 6, Oct, 2015. Riga, Latvia
8. Lindgren, P, Lindner, M, Lindner, M, Pereira, D, Pinho, L, "Abstract Timers and their Implementation onto the ARM Cortex-M family of MCUs", Embed with Linux Workshop (EWiLi 2015). 4 to 9, Oct, 2015. Amsterdam, Netherlands
9. Pedro, A, Pereira, D, Pinho, L, Pinto, J, "Monitoring for a decidable fragment of MTLD", The 15th International Conference on Runtime Verification (RV'15). 22 to 25, Sep, 2015. Vienna, Austria
10. Vahabi, M, Tennina, S, Tovar, E, Andersson, B, "Response Time Analysis of Slotted WiDOM in Noisy Wireless Channels", International Conference on Emerging Technologies and Factory Automation (ETFA 2015). 8 to 11, Sep, 2015, Industrial Communication Technologies and Systems. Luxembourg, Luxembourg
11. Robles, R, McLernon, D, Ghogho, M, "A Random Access Protocol incorporating Multi-Packet Reception, Retransmission Diversity and Successive Interference Cancellation", 8th International Workshop on Multiple Access Communications (MACOM2015). 3, Sep, 2015. Helsinki, Finland
12. Robles, R, Gameiro, A, "Multi-Objective and Financial Portfolio Optimization of Carrier-Sense Multiple Access Protocols with Cooperative Diversity", 8th International Workshop on Multiple Access Communications (MACOM2015). 3, Sep, 2015. Helsinki, Finland
13. Loureiro, J, R., R, Tovar, E, "Distributed Sensing of Fluid Dynamic Phenomena with the XDense Sensor Grid Network", IEEE International Conference on Cyber Physical Systems, Networks and Applications (CPSNA'15). 19 to 21, Aug, 2015. Hong Kong, China
14. Souto, P, Sousa, P, Davis, R, Bletsas, K, Tovar, E, "Overhead-aware schedulability evaluation of semi-partitioned real-time schedulers", IEEE 21st International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA 2015). 19 to 21, Aug, 2015
15. Nikolic, B, Bletsas, K, Petters, S, "Hard real-time multiprocessor scheduling resilient to core failures", 21st IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA 2015). 19 to 21, Aug, 2015, pp 122-131. Hong Kong, China
16. Robles, R, Gameiro, A, Pereira, N, "System Level Simulation and Radio Resource Management for Distributed Antenna Systems with Cognitive Radio and Multi-Cell Cooperation", 4th International Conference on Future Generation Communication Technologies (FGCT 2015). 29, Jul, 2015. Luton, United Kingdom
17. Fonseca, J, Nélis, V, Nelissen, G, Pinho, L, "Analysis of self-interference within DAG tasks", 6th Real-Time Scheduling Open Problems Seminar (RTSOPS 2015). 7, Jul, 2015. Lund, Sweden

18. Nelissen, G, Fonseca, J, Raravi, G, Nélis, V, "Timing Analysis of Fixed Priority Self-Suspending Sporadic Tasks", 27th Euromicro Conference on Real-Time Systems (ECRTS 2015). 7 to 10, Jul, 2015. Lund, Sweden.
19. Pinho, L, Moore, B, Michell, S, Taft, S, "An Execution Model for Fine-Grained Parallelism in Ada", 20th International Conference on Reliable Software Technologies - Ada-Europe 2015 (Ada-Europe 2015). 25 to 29, Jun, 2015. Madrid, Spain
20. Nelissen, G, Pereira, D, Pinho, L, "A Novel Run-Time Monitoring Architecture for Safe and Efficient Inline Monitoring", 20th International Conference on Reliable Software Technologies - Ada-Europe 2015 (Ada-Europe 2015). 22 to 26, Jun, 2015. Madrid, Spain
21. Baldovin, A, Zovi, A, Nelissen, G, Puri, S, "The CONCERTO methodology for model-based development of avionics SW", 20th International Conference on Reliable Software Technologies - Ada-Europe 2015 (Ada-Europe 2015). 22 to 26, Jun, 2015. Madrid, Spain
22. Ullah, S, Tovar, E, "Performance Analysis of IEEE 802.15.6 Contention-based MAC Protocol", The IEEE International Conference on Communications (IEEE ICC 2015). 8 to 12, Jun, 2015, IEEE ICC 2015 - Communications QoS, Reliability and Modeling. London, United Kingdom
23. Garibay-Martínez, R, Nelissen, G, Ferreira, L, Pedreiras, P, Pinho, L, "Holistic Analysis for Fork-Join Distributed Tasks supported by the FTT-SE Protocol", 11th IEEE World Conference on Factory Communication Systems (WFCS 2015). 27 to 29, May, 2015, TII-SS-2: Scheduling and Performance Analysis. Palma de Mallorca, Spain
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27. Fonseca, J, Nélis, V, Raravi, G, Pinho, L, "A Multi-DAG Model for Real-Time Parallel Applications with Conditional Execution", The 30th ACM/SIGAPP Symposium On Applied Computing (SAC 2015). 13 to 17, Apr, 2015, Embedded Systems. Salamanca, Spain
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G.3. Books (Author)

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G.4. Chapter/paper in Books

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G.5. Publications (Editor)

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G.6. Other Publications

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2. Nikolic, B, Bletsas, K, "Towards realistic core-failure-resilient scheduling and analysis", Work in Progress Session, IEEE Real-Time Systems Symposium (RTSS 2015). 1 to 4, Dec, 2015. San Antonio, U.S.A.
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