INESC**PORTO**

INSTITUTO DE ENGENHARIA DE SISTEMAS
E COMPUTADORES DO PORTO
LABORATÓRIO ASSOCIADO

RELATÓRIO DE ACTIVIDADE
DAS UNIDADES

ACTIVITY REPORT OF INESC PORTO UNITS

This part of INESC Porto Report presents the report of scientific and technological activities.

The report of scientific and technological activities begins with a section presenting the Scientific Council, followed by the detailed description of the scientific and technological units of the institute, namely:

- Manufacturing Systems Engineering Unit
- Optoelectronics and Electronic Systems Unit
- Power Systems Unit
- Information and Communications Systems Unit
- Telecommunications and Multimedia Unit
- Innovation and Technology Transfer Unit

R1. SCIENTIFIC COUNCIL

President: Manuel António Cerqueira da Costa Matos

R1.1 INTRODUCTION

In the year 2007, the Scientific Council developed its activity through plenary meetings and e-mail conferencing. The regular activity of the Council included the contribution to reports, the formulation of opinions about institutional reports and plans and the validation of the publication prizes.

R1.2 SUMMARY OF ACTIVITIES

The Council analyzed and issued an opinion on the report of 2006 and plan for 2007 (in the framework of FCT multiyear funding), and also on the report of 2006 and plan for 2008 for the General Council of INESC Porto. The Council also gave its favorable opinion to the names appointed to the Board of Directors for the next two years' term.

The Council was asked to analyze, and agreed to, the association of LIAAD (Laboratory of Artificial Intelligence and Data Analysis) to INESC Porto – Associated Laboratory.

Finally, the Council, through its president, went on validating the applications to the publication prize paid to those authors with papers published in scientific journals that are indexed in reference databases. Analysis of the publication records since 2001 was initiated, with the aim of discussing the results during 2008.

R2. UNIT: UESP – MANUFACTURING SYSTEMS ENGINEERING

R2.1 SHORT DESCRIPTION OF THE UNIT

The main goal of the Manufacturing Systems Engineering Unit (UESP) is to contribute to the improvement of performance of industrial enterprises through R&D projects, consulting, technology transfer and training services. Along with a strong application focus, the Unit is committed to conduct high quality research projects. The Unit main competences are related to Operations Management and Enterprise Information Systems, applied to industrial companies and enterprise collaborative networks. The Unit main activity areas include: Enterprise Cooperation Networks, Operations Management and Production Planning, Internal Logistics, Optimization of Cutting and Packing, Systems integration, and consulting services.

The Unit promotes and participates in applied research projects, in partnership with software houses and equipment producers, aiming at the development of innovative products in the fields of: production planning, scheduling and control, quality and maintenance management, decision support, cutting and packing optimization, knowledge management, internal logistics and integration infrastructures.

The Unit's activity is grounded in research in the following scientific domains:

- Cooperative Enterprise Networks Management: Build-to-Order strategies for complexity and variety, dynamic capacity management, early warning management, operations co-ordination in dynamic supply networks, semantic and technical Interoperability, collaborative performance management, life-cycle support of self-forming business networks.

- Information Management and Knowledge in Collaborative Networks: socio-technical analysis models in organizational networks, collaborative processes in organizational networks, information and knowledge management in organizational networks.

- Operations Management and Production Planning: structuring of decision processes; optimization methods; Combinatorial Optimization and meta-heuristics; optimization for planning and scheduling problems; Simulation; Decision Support Systems.

- Optimization of Cutting and Packing: incorporation of real-world constraints and objectives in the pure/theoretical cutting and packing optimization models, integrated resolution of cutting and packing problems and related tactical and operational problems, use of meta-heuristic techniques, often in their multi-objective versions, hybridization of meta-heuristics and exact methods.

The Unit provides consulting services to industrial companies, including the analysis and optimization of business processes, requirements analysis of IT systems, selection of IT systems (ERP and others), change management and support in the implementation phase. These services follow a proprietary methodology, developed over many years of experience. The Unit has also a large experience in the fields of manufacturing systems integration.

The Unit plays also a role in the promotion of the utilization of advanced technologies by industrial enterprises through dissemination, training and consulting actions, aiming at creating awareness of the advantages and limitations of new technological solutions, identifying new requirements, and supporting their implementation. The Unit provides R&D services to develop innovative products to technology suppliers, software houses, systems integrators and producers of manufacturing equipment.

R2.2 ACTIVITIES DEVELOPED IN 2007

R2.2.1 National programmes

During 2007, 11 projects have been executed with the support from national RTD programmes, representing 33, 19% of the year income.

The Meta-Sim and APIS projects finished in 2007 and have been supported by the Praxis XXI Research programme, having generated significant scientific contributions in the optimization area. The projects PLCoolNet (A multi-paradigm approach to performance management is collaborative networks) and CROME (Creativity in optimization with Meta-heuristics) started in the end of 2007.

Projects GESTE (that has developed an innovative scheduling system for textile companies) and CEC-MadeShoe-prime (large project for the shoe industry, complementary to the CEC-Madeshoe European project) and SIMULOG (Simulation framework for the rapid development of simulation models of internal logistics automation systems) were supported by the PRIME programme.

The RCED project has identified the requirements and potential advantages of implementing High Performance Enterprise Networks in the North of Portugal and was supported by the North Operational Programme (ON). This project finished in December and delivered a methodology for the creation and performance evaluation of enterprise collaborative networks.

The SIDAT project supported the preparation of a patent in the field of internal logistics automation.

The Competence Network on ICT for the Fashion clusters - TECMODA started in 2006 with the aim of activating a knowledge community for the fashion industries, able to follow the state of the art, develop technical visions for the future and promoting research projects. A participation of the competence network for MOBILITY was achieved. They were supported by Agência de Inovação.

R2.2.2 European programmes

During 2007 the Unit participated in 6 European projects, that have represented 44, 01% of its global activity.

The Kobas project (Maintenance management solutions for industrial machines) was supported by the IST programme. The CEC-Made-Shoe project (large integrated project improving materials, processes, machines and ICT in the Shoe industry) was supported jointly by the IST and by the Growth programmes.

Knowconstruct was supported by the COLLECTIVE research programme and aims at providing Knowledge Management and Collaboration tools for Construction SMEs.

AC/DC is a large project that started in November 2006 and is supported by the Transports European programme. It aims at creating the conditions to produce cars in five days, from the car specification by the customer to its delivery. INESC Porto participates in the supply chain optimization for this scenario.

The project R+D+I for SME's (promoting RTD and innovation activities in SME's) was supported by the INTERREG programme. The IRC Portugal project (promotion of trans-national technology transfer) was supported by the INNOVATION programme.

R2.2.3 Other programmes, consulting, services

The main consulting and technology transfer projects during 2007 were:

- o PRONIC - definition and management of technical standards for the construction industry, and IT support tools.
- o Design and development of an aggregate planning system for shoe supply networks.

- o Design and specification of a scheduling application for a company that produces decorative high pressure laminates.

- o Consulting contracts to support several companies (Durit, Moldit, Alba, Siclave, and Cifial) in analyzing their business processes, identifying their requirements in IT, supporting the selection and implementation of the selected solutions.

- o Technical support to the systems and applications previously installed at SONAFI.

- o Technical support to the implementation of Internal Logistic systems produced by the partner company Lirel.

R2.3 SUMMARY OF RESULTS OF THE RESEARCH ACTIVITIES OF THE TEAM MEMBERS

- **Projects**

Summary of projects developed in 2007

Type of Activity (1)	No. Projects (2)			Total Income (€)
	N	E	I	
R - Research	11	4		845.913
D - Development	4			88.300
C - Consulting	3			97.500
A – Advanced training				
T – Technology Transfer	2	2		153.060
O - Other				
TOTAL	20	6		1.184.773

Summary of relative distribution of sources of income

Financing (3)	Status (4)			Total Income (€)
	S - Started	OG– On-going	C - Concluded	
NP – National Programmes	15,07%	12,04%	6,08%	393.123
EP – European Programmes		27,61%	16,40%	521.450
CS – Consulting and services	5,96%	16,03%	0,82%	270.200
O – Other R&D sources				
OS – Other sources				
Total	21,03%	55,68%	23,29%	1.184.773

Summary of projects developed in 2007

Name of the project	Respons.	Type proj. (1)	Degree of intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
CONSULTORIA	A. C. Alves	C	N	CS	-	-	Several contracts	OG
LIREL	P. S. Marques	T	N	CS	-	-	Renewable	OG
SONAFI	Paula Silva	D	N	CS	-	-	Renewable	OG
IRCPortugal	A. C. Alves	T	E	EP	IST	04-2004	03-2008	OG
KOBAS	A. Azevedo	R	E	EP	NMP	06-2004	05-2007	F
I+D+I PME's	A.C. Alves	T	E	EP	Interreg	09-2004	05-2007	F
CEC Made Shoe	Rui Diogo	R	E	EP	IST	10-2004	09-2008	OG
CEC-MadeShoe-Prime	Rui Diogo	R	N	NP	Prime	10-2004	06-2008	OG
ISO-Pross	Paula Silva	R	N	NP	Ideia	10-2004	03-2007	F
DURIT AD	A. C. Alves	C	N	CS	Demtec	12-2004	05-2008	OG
KnowConstruct	Lucas Soares	R	E	EP	C. R.	01-2005	08-2007	F
SONAE	Luís Guardão	D	N	CS	-	06-2005	12-2007	F

Name of the project	Respons.	Type proj. (1)	Degree of intern. (2)	Financ. Type (3)	Financ. Prog.	Starting date	Conclusion (prediction)	Status (4)
META-SIM	J.P. De Sousa	R	N	NP	FCT	07-2005	12-2007	F
RCED	Luis Carneiro	R	N	NP	PON	07-2005	09-2007	F
APIS	J. F. Oliveira	R	N	NP	FCT	09-2005	09-2007	F
PRONIC	Luís Guardão	R	N	CS	-	01-2006	03-2008	OG
SIDAT	Luís Guardão	T	N	NP	SIUPI	01-2006	06-2008	OG
AC/DC	J.P. De Sousa	R	E	EP	IST	10-2006	09-2010	OG
IZARO GREY	Luís Guardão	D	N	CS	-	01-2007	10-2010	S
TecModa	C. Toscano	R	N	NP	ADI	01-2007	07-2008	S
SIMULOG	Paulo Marques	R	N	NP	Prime	02-2007	06-2008	S
RCM	J.P. De Sousa	R	N	NP	Redes Cp.	06-2007	06-2008	S
SAPIR	Rui Diogo	D	N	CS	-	06-2007	06-2008	S
CIFIAL	A. C. Alves	C	N	CS	-	10-2007	06-2008	S
PMCOLNET	A. Soares	R	N	NP	FCT	11-2007	12-2008	S
CROME	J. S. Ferreira	R	N	NP	FCT	12-2007	12-2008	S

(1) Type of Project: R - Research; D – Development; C – Consulting; A – Advanced Training; T – Technology Transfer; O - Other

(2) Degree of internationalization: N – National; E - European; I – International *(Select one)*

(3) Source of financing: NP – National Programmes; EP – European Programmes; CS – Consulting and services; O – Other R&D financing sources; OS – Other sources

(4) Status: S – Starting: activities initiated in 2007 and continuing in 2008; OG – On-going: activities started earlier than 2007 and continuing in 2008; F – Finished: activities ending in 2007.

- **Summary of publications**

Summary of publications in 2007

Type of publication	Number
Theses concluded in 2007 by members of the unit	
Books (author)	
Chapter/paper in books	
Publications (editor)	
Papers in International Journals with scientific referees	7
Papers in National Journals with scientific referees	
Conference Proceedings in events with scientific referee and selection	17
Other publications (National meetings, local journals, etc.)	14
Total	38

- **Summary of post-graduation activities**

Summary of theses supervised by members of the unit in 2007

Type	Starting	On-going	Concluded	Total
Master	17	11	3	31

Type	Starting	On-going	Concluded	Total
Doctoral	6	10	1	17
Total	23	21	4	48

- **Summary of Advanced Training Actions**

Summary of Advanced Training Actions organized for external trainees in 2007

Type	Number
Training for graduation students *(estágios curriculares)*	4
Training for others *(estágios extra-curriculares)*	
Professional training actions *(estágios profissionais)*	3
Other actions	
Total	7

- **Summary of activities of cooperation or dissemination**

Summary of items

Type	Number
Organizing conferences or meetings	2
Collaboration in papers authored by INESC Porto researchers	12
External persons directly involved in actions organized by INESC Porto	15

- **Human resources in 2007**

Summary of Unit personnel at the end of 2007

Type	Education				Total	Variation (*)
	PhD.	MSc.	BSc.	Other		
R&D						
University or Polytechnic Staff	11	5	1		17	-2
INESC Porto Grant Holders		1	5		6	-2
Other Grant Holders		1			1	0
Employees	1	2	8	2	13	+1
Trainees			2		2	+1
Other						
Administrative			2		2	0
Total	12	9	18	2	41	-2

(*) Relative to 2006, in absolute numbers.

R2.4 LIST OF PUBLICATIONS

R2.4.1 Theses concluded in 2007 by members of the unit

Blank.

R2.4.2 Books (Author)

Blank.

R2.4.3 Chapter/paper in Books

Blank.

R2.4.4 Publications (Editor)

Blank.

R2.4.5 International Journals with scientific referees

CARRIZZO, A., CARNEIRO, L.M., TAVARES, M., "Critical technologies for the North of Portugal in 2015: the case of ITCE sectors - information technologies, communication and electronics", International Journal of Foresight and Innovation Policy, 2007 - Vol. 3, No.2 pp. 187 – 206, Inderscience.

CHITUC, C., et al., "The Join/Leave/Remain (JLR) decision in collaborative networked organizations", August 2007, Computers & Industrial Engineering Journal, 53 (2007), pp. 173-195.

LOBO, BERNARDO A., KLABJAN, D., CARRAVILLA, MARIA A., OLIVEIRA, JOSE F., "Single machine multi-product capacitated lot sizing with sequence-dependent setups", "International Journal of Production Research", Vol.45 nº 20, pp.4873-4894, 2007.

MOREIRA, L.M., OLIVEIRA, J.F., GOMES, A.M., SOEIRO FERREIRA, J., "Heuristics for a dynamic rural postman problem", Computers and Operations Research, 2007, no.34, p.3281-3294.

Oliveira, JF; Roberto Frias, R; Wascher, G, "Cutting and packing", European Journal of Operational Research, Volume: 183, Issue: 3, Pages: 1106-1108, 2007.

PEDROSO, J.P., "Simple meta-heuristics using the simplex algorithm for non-linear programming", In Thomas Stützle, Mauro Birattari, and Holger H. Hoos, editors, Lecture Notes in Computer Science, volume 4638. Springer, 2007.

PEREIRA, C., SOARES, A.L., "Improving the quality of collaboration requirements for information management through social networks analysis", International Journal of Information Management, March 2007, p.86-103.

R2.4.6 National Journals with scientific referees

Blank.

R2.4.7 Conference Proceedings with scientific referees

FERREIRA, H., SOARES, A.L., "Community Knowledge Sharing: issues on the use of ontologies"*, in proceedings of EPIA 2007 - 13th EPIA International Conference - Portuguese Conference on Artificial Intelligence*, December 2007, Guimarães, Portugal.

PEREIRA, D., FERREIRA, H., SOARES, A.L., "Composition and Decomposition of Ontologies"*, in proceedings of EPIA 2007 - 13th EPIA International Conference - Portuguese Conference on Artificial Intelligence*, December 2007, Guimarães, Portugal.

SOARES, A.L., FERREIRA, H., SILVA, M.F., PEREIRA, D., "Supporting the Emergence of Knowledge Communities in Industrial Association Groups in the Construction Sector"*, in Proceedings of CIB W102 3rd Int. Confer. - Information and Knowledge Management - Helping the Practitioner in Planning and Building*, October 2007, Stuttgart, Alemanha.

CHITUC, C., TOSCANO, C., AZEVEDO, A., "Towards seamless interoperability in collaborative networks", September 2007, PRO-VE 2007 - 8th IFIP Working Conference on VIRTUAL ENTERPRISES, September 2007, Establishing the Foundation of Collaborative Networks (Eds. Camarinha-Matos et al.), vol.243, p.445-452. Guimarães, Portugal.

CRISPIM, J., PINHO DE SOUSA, J., "Multiple criteria partner selection in virtual enterprises"*, in Proceedings of* PRO-VE 2007 - 8th IFIP Working Conference on VIRTUAL ENTERPRISES, September 2007, Guimarães, Portugal (Conference best paper award).

PEDROSO, J.P., "Simple Meta-heuristics using the simplex algorithm for non-linear programming"*, in Proceedings of SLS 2007 - Engineering Stochastic Local Search Algorithms - Designing, Implementing and Analyzing Effective Heuristics*, September 2007, Brussels, Belgium.

PEREIRA, D., FERREIRA, H., SOARES, A.L., "Ontology Engineering in Virtual Breeding Environments"*, in Proceedings of PRO-VE 2007 - 8th IFIP Working Conference on Virtual enterprises*, September 2007, Guimarães, Portugal (Conference 2nd best paper award).

PEREIRA, C., SILVA, M.F., FERNANDES, J., SOARES, A.L., "Understanding Users' response to ontology based systems in the context of an Enterprise Sponsored Virtual community"*, in Proceedings of PRO-VE 2007 - 8th IFIP Working Conference on Virtual enterprises*, September 2007, Guimarães, Portugal.

CHITUC, C., TOSCANO, C., AZEVEDO, A., "Collaborative Business Processes Integration and Management - Lessons learned from industry"*, in Proceedings of 2007 IEEE International Conference on Services Computing (SCC 2007)*, IEEE SCC 2007, p.451-457, July 2007, Salt Lake City, UTAH, Estados Unidos América

CHITUC, C., TOSCANO, C., AZEVEDO, A., "E-business and Collaborative Networks: A two-layered operational infrastructure for the shoe manufacturing up-stream segment", *INDIN 2007 - 5th IEEE International Conference on Industrial Informatics*, July 2007, vol.1, p.591-596 Viena, Áustria.

GOMES, A.M., OLIVEIRA, J.F., "A VNS approach to the Irregular Strip Packing Problem"*, in Proceedings of MIC 2007 - The Seventh Metaheuristics International Conference*, June 2007, Montreal, Canadá.

VIANA, A., PINHO DE SOUSA, J., MATOS, M., "Constraint Oriented Neighborhoods: an application to the hydrothermal coordination problem"*, in Proceedings of MIC 2007 - The Seventh Metaheuristics International Conference*, June 2007, Montreal, Canadá.

SANTOS, A., SOEIRO FERREIRA, J., "Scheduling in the Textile Industry"*, in proceedings of* "III SELASI - European Latin American Workshop on Engineering Systems", April 30 to May 3, 2007, Curicó, Chile.

ALVES, A.I., CARNEIRO, L.M., MADUREIRA, R., SOARES, A.L., PINHO DE SOUSA, J., PATRÍCIO, R., "High performance collaborative networks: a realistic innovation or just an academic desire?", *Proceedings of ERIMA 07 - European Symposium on Innovative Management Practices*, March 2007, Biarritz, França.

CHITUC, C., TOSCANO, C., AZEVEDO, A., "Interoperability in Collaborative Networks: An innovative approach for the shoe up-stream business segment", I-ESA07 *Interoperability for Enterprise Software and Applications*, - "Enterprise Interoperability II - New Challenges and Approaches", p.557-568, March 2007, Funchal, Madeira

CHITUC, C., TOSCANO, C., AZEVEDO, A., "Towards the creation of a digital business ecosystem for the shoe manufacturing domain", *IEEE DEST 2007 - Inaugural IEEE International Digital Ecosystems and Technologies Conference*, IEEE DEST, no.88, p.93, February 2007, Cairns, Australia.

MADUREIRA, R., "The "Doctoral Paradox" of Information Societies", *RIP'07 - 1st International Seminar on Regional Innovation Policies*, February 2007, Porto, Portugal.

R2.4.8 Other Publications

SOEIRO FERREIRA, J., "Scheduling in the Textile Industry – the Case of the Looms", "VII Int. Workshop in Cutting and Packing and Related Topics", Leiria, 9-12 Sept, 2007.

GOMES, A.M., OLIVEIRA, J.F., "A VNS approach to the Irregular Strip Packing Problem", *Optimization 2007*, June 2007, Porto, Portugal.

Almada-Lobo, B.; Carravilla, Maria Antónia e Oliveira, José Fernando, "Short-term production planning and scheduling in glass container industry", Optimization 2007 Conference, July 2007, FEP, Porto, Portugal.

Carravilla, Maria Antónia e Oliveira, José Fernando, "E-voting systems evaluation criteria: facilitating a common understanding", EURO 2007 Conference, July 2007, Prague, Czech Republic.

COSTA, M.T., GOMES, A.M., OLIVEIRA, J.F., "Clusters Lattice Packing: a new approach to the Irregular Packing Problem", *Optimization 2007*, July 2007, Porto, Portugal.

GOMES, A.M., OLIVEIRA, J.F., "A VNS approach to the Irregular Strip Packing Problem", *EURO XXII - 2007 - 22nd European Conference on Operational Research EURO XXII*, July 2007, Prague, Czech Republic.

Marques, T.; Teiga, E.; Oliveira, J. F. & Carravilla, M. A., "Cleopatra I A Decision Support System for production and distribution planning at CUF-QI", Optimization 2007 Conference, July 2007, FEP, Porto, Portugal.

OLIVEIRA, J.F., PARRENO, F., ALVAREZ-VALDES, R., TAMARIT, J., "Neighborhood structures for the container loading problem: a VNS implementation ", *EURO XXII - 2007 - 22nd European Conference on Operational Research EURO XXII*, July 2007, Praga, República Checa.

Pacheco, J.; Marques, T.; Teiga, E.; Oliveira, J. F. & Carravilla, M. A., "Cleopatra II - Production Planning of a Chemical Process Industry CUF-QI, Optimization 2007 Conference, July 2007, FEP, Porto, Portugal.

PINHO DE SOUSA, J., ANDRADE, M., " A multi-criteria framework for supporting the design and evaluation of Demand Responsive Transport services", EURO XXII – 22nd European Conference on Operational Research, July 2007, Prague, Czech Republic.

REGO, N., PINHO DE SOUSA, J., "Hospital supply chain configuration using tabu search", EURO XXII – 22nd European Conference on Operational Research, July 2007, Prague.

GOMES, A.M., " Clusters Lattice Packing: a new approach to the Irregular Packing Problem ", *4th ESICUP - 4th ESICUP Meeting*, March 2007, Tokyo, Japão.

GOMES, A.M., OLIVEIRA, J.F., "A Hybrid Multi-Stage Approach to the Irregular Strip Packing Problem ", *CPLSA 2007 - Cutting, Packing, Layout and Space Allocation*, March 2007, Dagstuhl, Alemanha.

PARREÑO, F., ALVAREZ-VALDES, R., OLIVEIRA, J.F., TAMARIT, J., "A maximal-space GRASP algorithm for the container loading problem", *CPLSA 2007 - Cutting, Packing, Layout and Space Allocation*, March 2007, vol.46, Dagstuhl, Alemanha.

R2.5 LIST OF JOURNALS

Journal	Number of papers
Computers & Industrial Engineering Journal	1
Computers and Operations Research	1
European Journal of Operational Research	1
International Journal of Foresight and Innovation Policy	1
International Journal of Information Management	1
International Journal of Production Research	1
Lecture Notes in Computer Science	1
TOTAL	7

R2.6 LIST OF PATENTS
Blank.

A2.7 LIST OF PROTOTYPES
Name: Maintenance management solutions for industrial machines (final prototype)
Developed under (Project Name): Kobas
Demo Place: INESC Porto
Development Period: 2005-2007

Name: Aggregate planning system for shoe supply networks (second prototype)
Developed under (Project Name): SAPIR
Demo Place: Aerosoles Company
Development Period: 2006-2007

Name: A scheduling system for decorative high pressure laminates (Final prototype)
Developed under (Project Name): SIR
Demo Place: SONAE
Development Period: 2006-2007

Name: LatticePacking - Large-Scale Periodic Packing of Irregular Shapes (final prototype)
Developed under (Project Name): APIS

Demo Place: FEUP
Development Period: 2006-2007

Name: One-Step production process Logistc automation system
Developed under (Project Name): CEC-Made-Shoe
Demo Place: Kyaia
Development Period: 2005-2007

Name: Workflow system supporting collaboration processes in footwear supply chains (first prototype)
Developed under (Project Name): CEC-Made-Shoe
Demo Place: GestVar
Development Period: 2006-2007

Name: Community Knowledge management for SME's from the construction insdustry
Developed under (Project Name): Know-construct
Demo Place: APCMC, Porto
Development Period: 2006-2007

Name: Optimization System for looms scheduling (Textile industry)
Developed under (Project Name): GESTE
Demo Place: COELIMA
Development Period: 2006-2007

Name: System for the management of standard technical processes in the construction industry at national level (first prototype)
Developed under (Project Name): PRONIC
Demo Place: INESC Porto
Development Period: 2006-2007

Integration infrastructure for shoe manufacturers and suppliers, using ShoeNet and ebXML standards
Developed under (Project Name): ShoeBiz
Demo Place: Centro Tecnológico do Calçado
Development Period: 2006

Aggregate planning system for shoe supply networks (first prototype)
Developed under (Project Name): SAPIR
Demo Place: Aerosoles company
Development Period: 2006

A scheduling system for decorative high pressure laminates (first prototype)
Developed under (Project Name): SIR
Demo Place: SONAE
Development Period: 2005-2006

R2.8 LIST OF THESES SUPERVISED BY MEMBERS OF THE UNIT DURING 2007

PhD Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Bernardo Sobrinho Simões de Almada-Lobo	FEUP	José Fernando Oliveira Maria Antónia Carravilla	INESC Porto/FEUP	Scheduling problems in the glass containers industry	2007
Claudia Melania Chituc	FEUP	Américo Azevedo	INESC Porto/FEUP	Self-organization in enterprises and business networks and behavior semantics	2008
Dora Simões	FEUP	António Lucas Soares	INESC Porto/FEUP	Socio-technical Models for the formation and dissolution of Cooperation Networks of Small and Medium Enterprises.	2008
João Claro	FEUP	Jorge Pinho de Sousa	INESC Porto/FEUP	Multiobjective metaheuristic approaches for mean-risk combinatorial optimization with applications to capacity expansion	2008
José Crispim	FEUP	Jorge Pinho de Sousa	INESC Porto/FEUP	Contributions for a multi-criteria model for supporting the creation of collaborative enterprise networks	2008
Maria Teresa do Valle Moura da Costa	FEUP	José Fernando Oliveira António Miguel Gomes	INESC Porto/FEUP	New approaches to the periodic placement of irregular shapes	2008
Ana Maria Rodrigues	FEUP	José Soeiro Ferreira	INESC Porto/FEUP	Combinatorial Optimization with Metaheuristics	2009
Célia Talma Matins	FEUP	Eugénio Oliveira Américo Azevedo	FEUP INESC Porto/FEUP	Collaborative Business in Enterprise Networks: Inter-organizational processes.	2009
Manuel Fernando Silva	FEUP	Rute Costa António Lucas Soares	UNL INESC Porto/FEUP	Terminology contributions for the development and operation of semantic platforms supporting knowledge communities	2009
Maria do Rosário Moreira	FEUP	José Soeiro Ferreira	INESC Porto/FEUP	Combinatorial Optimisation in Graph Problems	2009
Bruno Prata	FEUP	Jorge Pinho de Sousa Teresa Galvão	INESC Porto/FEUP	Integrated vehicle and driver scheduling in public transport systems: a multi objective approach	2010
Carla Sofia Pereira	FEUP	António Lucas Soares	INESC Porto/FEUP	Agile Methods for the construction and evolution of multiple onthologies: applications in the information and knowledge management in networks of organizations	2010
Marisa Oliveira	FEUP	António Miguel Gomes Eduarda Pinto Ferreira	INESC Porto/FEUP	Positioning and Routing Problems in the design of Integrated Circuits (VLSI e ASICs)	2010
Nazaré Rego	FEUP	Jorge Pinho de Sousa	INESC Porto/FEUP	Hospital supply chain configuration using multiobjective metaheuristics	2010
Roberto Piedade	FEUP	Américo Azevedo	INESC Porto/FEUP	Performance Management and Alignment on Collaborative Networks in SME's	2010
Susana Araújo	FEUP	Jorge Pinho de Sousa Eduarda Pinto Ferreira	INESC Porto/FEUP	Contributions for an integrated Optimization /Simulation approach for problems in Operations Management and Logistics	2010
Teresa Neto	FCUP	João Pedro Pedroso Miguel Constantino	INESC Porto/FCUP FCUL	Mathematical models and algorithms for forest management	2010
1	*2*	*3*	*4*	*5*	*6*

1 – Name of the post-graduation student

2 – Institution where the thesis is submitted; if the host institution for the student is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester

3 – Name of supervisor or supervisors

4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid

5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

MSc Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Nazaré Gonçalves do Rego	EGP	Jorge P. Sousa	INESC Porto/FEUP	Decision support for managing hospital supply chains	2007
Pedro Lobo	UA	Américo Azevedo	INESC Porto/FEUP	Heath care services in Portugal: Applicability of management by processes.	2007
Teresa Marques	EGP (UP)	Maria Antónia Carravilla	INESC Porto/FEUP	Decision Support System for production and distribution planning at Quimigal.	2007
Alexandre Fabião	FEUP	Maria Antónia Carravilla José Fernando Oliveira	INESC Porto/FEUP	Sistema de Apoio à afectação de veículos a reservas em empresas de "rent-a-car"	2008
Ana Santos	FEUP	José Soeiro Ferreira	INESC Porto/FEUP	Parallel Machine Scheduling	2008
Bruno Paulino	FEUP	António Lucas Soares	INESC Porto/FEUP	Strategies for information classification in RTD organizations	2008
Carlos Vita	FEUP	Maria Antónia Carravilla	INESC Porto/FEUP	FRASA SA - Modernização tecnológica da estrutura logística	2008
Hugo Caldeira	FEUP	José Soeiro Ferreira	INESC Porto/FEUP	Logistic Pallet and Packing problems	2008
Hugo Gonçalves	FEUP	Américo Azevedo	INESC Porto/FEUP	Lean Operations - production systems operational integration	2008
Hugo Vara	FEUP	António Lucas Soares	INESC Porto/FEUP	Creativity and idea management in collaborative networks: the role of information management	2008
Inês Souto e Castro	EGP	Américo Azevedo	INESC Porto/FEUP	Definition of a cost model: application to the cork transforming industry	2008
Joana Conceição	FEUP	José Fernando Oliveira	INESC Porto/FEUP	Modelos de logística inversa para a indústria farmacêutica	2008
João Pimentel Peixoto Coentro	FEUP	Américo Azevedo	INESC Porto/FEUP	Service Quality Management Model in Information Systems Development	2008
Jorge Silva	FEUP	António Lucas Soares	INESC Porto/FEUP	Management of information of performance of organizational networks: The case of virtual communities	2008
José Augusto	FEUP	António Lucas Soares	INESC Porto/FEUP	Approach for the implementation of knowledge communities in enterprise associations	2008
José Pedro Coelho Rodrigues	FEUP	Maria Antónia Carravilla José Fernando Oliveira	INESC Porto/FEUP	Sistema de Apoio à elaboração de horários em Unidades de Cuidados Continuados	2008
Karla Gurgell	FEUP	António Lucas Soares	INESC Porto/FEUP	The contribution of requirements engineering in the specification of onthologies: application in collaborative networks	2008
Marta Tavares	FEUP	Jorge P. Sousa	INESC Porto/FEUP	Modeling and assessment of production policies using simulation	2008
Miguel Andrade	EGP	Jorge P. Sousa	INESC Porto/FEUP	A multi-criteria framework for the design and assessment of Demand Response Transport services	2008
Nuno Abreu	FEUP	António Miguel Gomes	INESC Porto/FEUP	IP-Nest — Geometric Library for Nesting Problems	2008
Nuno Miguel Pinto	FEUP	António Miguel Gomes	INESC Porto/FEUP	SADGTT — Decision Support System for Managing the Maintenance of Conveyor Belts	2008

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Paulo Rodrigues	FEUP	Américo Azevedo	INESC Porto/FEUP	Pedras Salgadas – Solution for measuring CO_2 flux in the process	2008
Pedro Cruz	FEUP	José Soeiro Ferreira	INESC Porto/FEUP	Task Scheduling in a Paint Factory	2008
Rita Estácio	EGP	Jorge P. Sousa	INESC Porto/FEUP	Cost models for Demand Response Transport services	2008
Rui Pinto Ferreira	FEUP	António Lucas Soares	INESC Porto/FEUP	Development of multi-criteria collaborative decision model for performance management in networks of organizations	2008
Tomé Costa	FEUP	António Miguel Gomes	INESC Porto/FEUP	Cutting Paths in Dynamic Graphs	2008
Vitor Santos	FEUP	António Lucas Soares	INESC Porto/FEUP	Collaborative information management in the Gondomar Library	2008
Inês Santos	FCUP	João Pedro Pedroso	INESC Porto/FCUP	Specification and development of a collaborative agenda with minimisation of penalties	2009
Roberto Colazingari	FCUP	João Pedro Pedroso Abdur Rais	INESC Porto/FCUP INESC Porto	Implementation of a simulator for assembly lines	2009
Rui Rei	FCUP	João Pedro Pedroso Peter Madera	INESC Porto/FCUP Qimonda	Development of an OSS Shop-Floor Simulation Engine'	2009
Suzy Vasconcelos da Silva	FCUP	João Pedro Pedroso Abdur Rais	INESC Porto/FCUP INESC Porto	Systems for resource planning and optimisation	2009
1	2	3	4	5	6

1 – Name of the post-graduation student
2 – Institution holding the course where this student in enrolled in; if the host institution is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester
3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

R2.9 ORGANISATION OF INTERNATIONAL SCIENTIFIC EVENTS

4th ESICUP Meeting, Tokyo, Japan, March 25-27 2007 (José Fernando Oliveira, António Miguel Gomes).

Conference MANUFUTURE 2007 – Constructing a sustainably competitive Europe. Conference organized by INESC Porto under the scope of the Technology Platform Manufuture. Over 500 delegates from leading companies and academia attended the conference.

R2.10 ADVANCED TRAINING

Blank.

R2.11 OTHER CONTRIBUTIONS TO THE OBJECTIVES OF ASSOCIATE LABORATORY

UNIT: UESP – MANUFACTURING SYSTEMS ENGINEERING	Thematic Line
Development of the innovative, advanced concept of SME's knowledge community; new empirical knowledge generated about virtual communities in an SME context and new business/IS architecture for information management in industrial associations.	Enterprise Cooperation Networks
New methods for collaborative ontology specification and for ontology segmentation and integration of existing knowledge sources; Requirements structuring for effective reasoning with instances in knowledge bases, using semantic web technologies	
The RCED project (High Performance Enterprise Cooperation Networks in the North of Portuga) developed a methodology for the implementation and performance evaluation of enterprise collaborative networks. The state of the art and strategy for the development of enterprise networks in the North of Portugal was defined.	
The AC/DC European Integrated Project started by the end of 2006, and produced innovative concepts and solutions for planning and management of complex supply chains (applied in the automotive industry for the fast production of customized cars).	
Research on multi-criteria approaches for partner selection in Virtual Organizations and Collaborative Networks.	

R2.12 ANALYSIS AND ASSESSMENT OF DEVIATIONS RELATIVE TO FORMER PLANNING

R2.12.1 Comparison with strategic actions or policy lines defined in the plan of the previous year

No significant deviations to highlight.

R2.12.2 Cases of success, problems met, internal and external conditioning factors

The "scheduler" developed by INESC Porto and integrated in the IZARO-GREY system; marketed by SOFTI9 and I68 (Spain) could be considered as a commercial success during its first year of existence. The distribution network was enlarged to a large Portuguese ERP vendor and one company selling in Germany and Austria. At the moment 16 licenses were sold by I68 and an important increase in sales is expected.

In the CEC-Made-Shoe project an innovative concept and system for internal logistic automation for shoe production in one-step was achieved. This new system allows important improvement of the productivity and flexibility of production lines (assembly, finishing and packaging).

International recognition of some elements of INESC Porto was clearly demonstrated by the successful organization of international scientific meetings (especially the Manufuture Conference with more than 500 delegates).

The end of national and European RTD funding programmes creates additional difficulties in acquiring new projects. This has short term difficulty has to be compensated by more contracts with companies.

New opportunities for collaboration with companies in various sectors, especially for consulting services, have emerged, and successful contacts with well-known international research groups and companies have created the basis for the development of future projects.

R3. UNIT: UOSE – OPTOELECTRONICS AND ELECTRONICS SYSTEMS

R3.1 SHORT DESCRIPTION OF THE UNIT

The Unit develops its activity in the areas of Optoelectronics and Electronic Systems Integration, mainly in the domain of optical fiber technology. The Electronics section is essentially oriented towards the process of technology transfer to industrial Portuguese companies, the integration of optoelectronic systems. The scientific research made by the Unit is directed to the research in the domain of Optoelectronics, particularly the applied research in optical fiber sources, optical communications, optical fiber sensors and micro fabrication (thin films and integrated optics). In the framework of its activity it proportionate the adequate environment to the integration of post-graduate students, mainly coming from the Physics Department of the Sciences Faculty of the University of Porto and the Electro technical and Computer Engineering Department of the Engineering Faculty of the same University. Throughout the years, R&D collaborations have been made with prestigious institutions, national and international (Universities, Institutes or companies), very often within the framework of R&D joint projects. Nowadays, the Unit priorities are: strengthen its competences in its areas of activity, through crossed fertilization actions among them beginning with a careful and adequate selection of R&D projects to be submitted, as well as institutional links with other organizations, to develop actions in order to maintain a minimum number of PhD researchers able to frame all the Unit R&D activity, to define the process of equipment renewal of the Unit with the goal of keeping a modern laboratory in optoelectronic technologies.

The main vectors of the Unit activity development are presented:

- Research, development and technology transfer in the area of the optical fiber sensors;
- Development and technology transfer in systems integration;
- Research in sol-gel technology;
- Research in optical filtering using fused coupler technology, Bragg gratings and long-period gratings;
- Research in optical coherent tomography for medical applications;
- Research and development in multi-axis optical fiber accelerometer;
- Research and development in micro packaging;
- Research and development in photovoltaic cells;
- Research in energy harvesting and scavenging for sensing.

R3.2 ACTIVITIES DEVELOPED IN 2007

R3.2.1 National programmes

During 2007 the Unit was involved in 10 R&D national projects. Two of these projects dealt with micro fabrication issues, seven were concerned with optical fiber sensors principles and applications and the other one is a first step in the area of micro-packaging of optical devices. Micro fabrication projects developed fundamental technology for sensors and communications devices in optical fiber and integrated optics that will enable further developments in these areas. Namely, add-drop multiplexers for optical communications, piezoelectric films in optical fibers for sensing and actuation and other novel devices were developed. The micro fluidics range of devices and the feasibility of manufacturing them in-house are being evaluated. The sensors projects were dedicated to applications in acoustic emission detection by optical fibers, evanescent field sensors for chemical species detection, measurement of carbon dioxide in algae cell culture, measurement of dissolved oxygen by fluorescence

and structural health monitoring in civil engineering. The Optpack project is oriented towards know-how acquisition in micro packaging technology for optical fiber devices.

The Unit was also involved in one technology transfer project related to micro packaging of optoelectronic components with FiberSensing.

R3.2.2 European programmes

The Unit took part in three European projects during 2007. URANUS was concerned with ultrafast technology for multicolor high power systems and the Unit participation is related to advanced optical fiber Bragg gratings fabrication and characterization. The project ended this year. Another project, FIDELIO, intends to develop the next generation of lidar onboard detection systems for aeronautics and the Unit works in fundamental issues of nonlinear optics. The project NextGenPCF arises from the observation that progress and continuing technological development in many fields will depend on new ways of producing and guiding light, and mastering its interaction with the environment. Photonic Crystal Fibre (PCF) technology has the potential to become an enabling optical component. This project integrates the key European industrial and academic groups, from raw material developers to final users. It aims at being the incubator of key devices in three fields of applications that corresponds to three IST strategic fields: Biomedical, Telecom and Sensors. The Unit contribution will be in the design and realization of the optical source for gas sensing, sensing head and full sensing system.

R3.2.3 Other programmes, consulting, services

The Unit continued the contract with Fibersensing in the framework of its first phase of development. Consultancy in optical fiber photosensitivity enhancement, optical fiber Bragg grating fabrication and characterization systems was given to the company enabling it to manufacture reliable and reproducible optical fiber Bragg gratings and related sensing heads, fully characterized and tested concerning its long term deployment.

In the framework of the European Space Agency, specifically Flight Hardware Activities and Long-Term Research and Development, the Unit managed to get a contract R&D project, on a competitive basis (ESA Announcement of Opportunity 1-4669/05/NL/HE). The ESA-ONE project is dedicated to technology development for integrated micro-optic filter to address optical signal detection in LIDAR applications. The research program will target future development of space borne LIDAR systems, thus providing a compact rugged integrated package with minimal size, weight, and power requirements but still fulfilling mechanical and thermal constrains for space applications. The primary goal of the proposed research program is to demonstrate and characterize the performance of an ultra narrowband optical fiber Bragg grating filter at 1600 nm, which corresponds to the CO_2 vapor lines of interest for space-based DIAL measurements.

R3.3 SUMMARY OF RESULTS OF THE RESEARCH ACTIVITIES OF THE TEAM MEMBERS

- **Projects**

Summary of projects developed in 2007

Type of Activity (1)	No. Projects (2)			Total Income (€)
	N	E	I	
R - Research	9	4		255.031
D - Development				
C - Consulting				
A – Advanced training				
T – Technology Transfer	3			146.290
O - Other				
TOTAL	12	4		401.321

Summary of relative distribution of sources of income

Financing (3)	Status (4)			Total Income (€)
	S - Started	OG– On-going	C - Concluded	
NP – National Programmes	4,96%	18,43%	6,33%	119.257
EP – European Programmes		42,98%	4,13%	189.060
CS – Consulting and services			23,17%	93.004
O – Other R&D sources				
OS – Other sources				
Total	4,96%	61,41%	33,63%	401.321

Summary of projects developed in 2007

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
URANUS	F. Araújo	R	E	EP	6PQ	07-2004	07-2007	OG
CORDVISION	I. Dias	T	N	NP	IDEIA	09-2004	08-2006	F
FIDELIO	M. J. Marques	R	E	EP	6PQ	12-2004	12-2007	OG
NODA	J. L. Santos	R	N	NP	FCT	01-2005	12-2006	F
CUTINSHEAR	F. Araújo	R	N	NP	FCT	03-2005	02-2007	OG
EVANESCENTE	J. L. Santos	R	N	NP	FCT	05-2005	04-2008	OG
OPTOPACK	F. Araújo	R	N	NP	FCT	05-2005	04-2007	OG
KAISER	L. A. Ferreira	R	N	NP	FCT	09-2005	08-2008	OG
WORKSTATION	F. Araújo	T	E	CS	PS	09-2005	12-2006	F
ESA-ONE	F. Araújo	R	E	EP	ESA	01-2006	12-2007	OG
Fibersensing	J. L. Santos	T	N	CS	PS	01-2006	12-2006	OG
IPF	O. Frazão	R	N	NP	FCT	01-2006	12-2006	F
MICROPACK	F. Araújo	T	N	NP	IDEIA	01-2006	12-2008	OG
NEXTGENPCF	L. A. Ferreira	R	E	EP	6PQ	01-2006	12-2008	S
OREO	P. V. Marques	R	N	NP	FCT	01-2006	03-2007	OG

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
OXIGÉNIO	J. L. Santos	R	N	NP	FCT	01-2006	12-2007	OG
CEMICRO	Paulo Marques	R	N	NP	AdI	07-2006	06-2008	S

(1) Type of Project: R – Research; D – Development; C – Consulting; A – Advanced Training; T – Technology Transfer; O - Other

(2) Degree of internationalization: N – National; E – European; I – International *(Select one)*

(3) Source of financing: NP – National Programmes; EP – European Programmes; CS – Consulting and services; O – Other R&D financing sources; OS – Other sources

(4) Status: S – Starting: activities initiated in 2007 and continuing in 2008; OG – On-going: activities started earlier than 2007 and continuing in 2008; F – Finished: activities ending in 2007.

- **Summary of publications**

Summary of publications in 2007

Type of publication	Number
Theses concluded in 2007 by members of the unit	3
Books (author)	
Chapter/paper in books	
Publications (editor)	
Papers in International Journals with scientific referees	27
Papers in National Journals with scientific referees	
Conference Proceedings in events with scientific referee and selection	12
Other publications (National meetings, local journals, etc.)	16
Total	58

- **Summary of post-graduation activities**

Summary of theses supervised by members of the unit in 2007

Type	Starting	On-going	Concluded	Total
Master	0	2	3	5
Doctoral	3	8	0	11
Total	3	10	3	16

- **Summary of Advanced Training Actions**

Summary of Advanced Training Actions organized for external trainees in 2007

Type	Number
Training for graduation students *(estágios curriculares)*	1
Training for others *(estágios extra-curriculares)*	
Professional training actions *(estágios profissionais)*	2
Other actions	

Type	Number
Total	3

- **Summary of activities of cooperation or dissemination**

Summary of items

Type	Number
Organizing conferences or meetings	1
Collaboration in papers authored by INESC Porto researchers	50
External persons directly involved in actions organized by INESC Porto	15

- **Human resources in 2007**

Summary of Unit personnel at the end of 2007

Type	Education				Total	Variation (*)
	PhD.	MSc.	BSc.	Other		
R&D						
University or Polytechnic Staff	13	2			15	+1
INESC Porto Grant Holders			5		5	-1
Other Grant Holders	0	6	1		7	-1
Employees	5		4	1	10	+4
Trainees		3	5	2	9	+10
Other			1		1	+1
Administrative				1	1	0
Total	18	11	16	4	49	+14

(*)   Relative to 2006, in absolute numbers.

R3.4 LIST OF PUBLICATIONS

R3.4.1 Theses concluded in 2007 by members of the unit

Joel Pedro Peixoto de Carvalho, Optical Switching Techniques: Device Development and Implementation in Fibre Optic Technology, MSc, December 2007, FEUP

Susana F. O. Silva, Fibre Bragg Grating Based Structures for Optical Sensing and Filtering, MSc, July 2007, FCUP

Catarina Silva, Long period grating sensors, MSc, July 2007, FCUP

R3.4.2 Books (Author)

Blank.

R3.4.3 Chapter/paper in Books

Blank.

R3.4.4 Publications (Editor)

Blank.

R3.4.5 International Journals with scientific referees

FRAZÃO, O., GUERREIRO, A., SANTOS, J.L., BAPTISTA, J.M., "Birefringence monitoring of a Hi-Bi fibre under chemical etching through a fibre loop mirror", Measurement Science % Technology, December 2007, vol.18, no.12, p.81-83.

FRAZÃO, O., SILVA, S.O., GUERREIRO, A., SANTOS, J.L., FERREIRA, L.A., ARAÚJO, F., "Strain Sensitivity Control of Fibre Bragg Grating Structures with Fused Tapers ", APPLIED OPTICS, December 2007, vol.46, no.36, p.8578-8582.

FRAZÃO, O., VIEGAS, J., CALDAS, P., SANTOS, J.L., ARAÚJO, F., FERREIRA, L.A., FARAHI, F., "All-fiber Mach'Zehnder curvature sensor based on multimode interference combined with a long-period grating", OPTICS LETTERS, November 2007, vol.32, no.21, p.3074-3076.

FRAZÃO, O., MARQUES, L., MARQUES, J.A., BAPTISTA, J.M., SANTOS, J.L., "Simple sensing head geometry using fibre Bragg gratings for strain-temperature discrimination", OPTICS COMMUNICATIONS, November 2007, vol.279, no.1, p.68-71.

FRAZÃO, O., BAPTISTA, J.M., SANTOS, J.L., "Recent advances in high-birefringence fiber loop mirror sensors", MDPI Sensors Journal, November 2007, vol.7, no.11, p.2970-2983.

JORGE, P., ANTÓNIO MARTINS, M., TRINDADE, T., SANTOS, J.L., FARAHI, F., "Optical Fiber Sensing Using Quantum Dots", MDPI Sensors Journal, November 2007, vol.7, p.3489-3534.

ROMERO, R., ARAÚJO, F., FERREIRA, L.A., "Absorption-line-locked fiber laser for gas-sensing applications ", APPLIED OPTICS, November 2007, vol.46, no.32, p.7900-7905.

FALATE, R., FRAZÃO, O., REGO, G., IVANOV, O., KALINOWSKI, H.J., FABRIS, J.L., SANTOS, J.L., "Bending Sensitivity Dependent on the Phase-Shift Imprinted in the Long-Period Fibre Gratings ", Measurement Science % Technology, October 2007, vol.18, p.3123-3130.

FRAZÃO, O., BAPTISTA, J.M., SANTOS, J.L., "Temperature-independent strain sensor based on a Hi-Bi photonic crystal fibre loop mirror", IEEE Sensors Journal, October 2007, vol.7, no.10, p.1453-1455.

IVANOV, O., REGO, G., "Origin of Coupling to Antisymmetric Modes in Arc-Induced Long-Period Fiber Gratings ", OPTICS EXPRESS, October 2007, vol.15, no.21, p.13936-13941.

REGO, G., IVANOV, O., "Two Types of Resonances in Long-Period Gratings Induced by Arc Discharges in B/Ge Co-Doped Fibers", OPTICS LETTERS, October 2007, vol.15, no.21, p.2984-2986.

VIEGAS, D., PINTO, N., ROMERO, R., FRAZÃO, O., COSTA, A., "Tunable First order Differential Group Delay generation using a Uniform Fibre Bragg Grating", Microwave and Optical Technology Letters , October 2007, vol.49, no.10, p.2451-2454.

FRAZÃO, O., BAPTISTA, J.M., SANTOS, J.L., "Strain and Temperature Discrimination using Concatenated Hi-Bi Fiber Loop Mirrors", IEEE Photonics Technology Letters, August 2007, vol.19, no.16, p.1260-1262.

FRAZÃO, O., CALDAS, P., ARAÚJO, F., FERREIRA, L.A., SANTOS, J.L., "Optical flowmeter using a modal interferometer based on a single non-adiabatic fibre taper", OPTICS LETTERS, July 2007, vol.32, no.14, p.1974-1976.

SAVU, R., JOANNI, E., "Influence of ambient gas on the growth and properties of porous tin-doped indium oxide thin films made by pulsed laser deposition", THIN SOLID FILMS, July 2007, vol.515, no.20, p.7813-7819.

IVANOV, O., "Reconstruction of parameters of an optical fiber from the transmission spectrum of long-period gratings induced in this fiber", OPTICS COMMUNICATIONS, April 2007, vol.272, no.2, p.395-402.

MARQUES, P., BONAR, J.R., LEITE, A.M.P., AITCHISON, J.S., "Bragg gratings in two-layer core planar silica-on-silicon waveguides and application to integrated lasers", ELECTRONICS LETTERS, April 2007, vol.43, no.9, p.519-520.

MENDONÇA, S., FRAZÃO, O., BAPTISTA, J.M., SANTOS, J.L., "Fibre optic displacement sensing monitored by an OTDR and referenced by Fresnel reflection and by fibre Bragg gratings", Microwave and Optical Technology Letters , April 2007, vol.49, no.4, p.768-770.

ROSA, C.S., ROGERS, J., PEDRO, J., ROSEN, R., PODOLEANU, A., "Multiscan time-domain optical coherence tomography for retina imaging", APPLIED OPTICS, April 2007, vol.46, no.10, p.1795-1808.

BAPTISTA, J.M., MARQUES, J.A., FRAZÃO, O., SANTOS, S., SANTOS, J.L., MARQUES, M.J., "Stimulated Brillouin scattering as the referencing mechanism of an optical fibre intensity sensor", OPTICS COMMUNICATIONS, March 2007, vol.271, p.224-227.

FRAZÃO, O., MARQUES, J.A., SANTOS, J.L., MARQUES, M.J., BAPTISTA, J.M., "Brillouin Fibre Laser discrete Sensor for Simultaneous Strain and Temperature Measurement", APPLIED PHYSICS B-LASERS AND OPTICS, March 2007, vol.86, p.555-558.

MOREIRA, P.M.G.P., FRAZÃO, O., TAVARES, S.M.O., FIGUEIREDO, M.A.V., RESTIVO, M.T., SANTOS, J.L., DE CASTRO, P.M.S.T., "Temperature field acquisition during gas metal arc welding using thermocouples, thermography and fibre Bragg grating sensors", Measurement Science % Technology, March 2007, vol.18, p.877-883.

REGO, G., FALATE, R., IVANOV, O., SANTOS, J.L., "Simultaneous Temperature and Strain Measurements Performed by a Step-Changed Arc-Induced Long-Period Fiber Grating", APPLIED OPTICS, March 2007, vol.46, p.1392-1396.

ROMERO, R., FRAZÃO, O., "Linear Tunable Dispersion Compensation Device Using Selective Stretching in Chirped Fibre Bragg Grating", Microwave and Optical Technology Letters, March 2007, vol.49, no.3, p.720-722.

DE LA CRUZ, J., VYSHATKO, N., VILARINHO, P., KHOLKIN, A., "Electrical properties of lead zirconate titanate thick films prepared by hybrid sol-gel method with multiple infiltration steps", Materials Chemistry and Physics, January 2007, no.101, p.280-284.

FRAZÃO, O., MORAIS, R., BAPTISTA, J.M., SANTOS, J.L., "Fibre ring laser sensor for strain-temperature discrimination based on four-wave mixing effect ", Optical Engineering, January 2007, Art. No. 010502.

SOPPERA, O., MOREIRA, P., MARQUES, P., LEITE, A., "Influence of temperature and environment humidity on the transmission spectrum of sol-gel hybrid channel waveguides", OPTICS COMMUNICATIONS 2007, vol.271, p.430-435.

R3.4.6 National Journals with scientific referees

Blank.

R3.4.7 Conference Proceedings with scientific referees

ALEXANDRE, D., VIEGAS, J., FERNANDES, L.A., SANTOS, J.L., MARQUES, P., "Fabrication and test of an integrated optical sensor with high sensitivity and high dynamic range based on a Mach-Zehnder interferometric configuration ", *Optics and Optoelectronic - Optics and Optoelectronics 2007* 2007, Praga, República Checa.

ALEXANDRE, D., VIEGAS, J., FERNANDES, L.A., MOREIRA, P., LEITE, A., SANTOS, J.L., MARQUES, P., "FABRICATION OF AN INTEGRATED OPTICAL SENSOR WITH HIGH SENSITIVITY AND HIGH DYNAMIC RANGE BASED ON A MACH-ZEHNDER INTERFEROMETRIC CONFIGURATION ", MME07 - Micromechanics Europe 2007, Guimarães, Portugal.

CARVALHO, J., MAGALHÃES, F., IVANOV, O., FRAZÃO, O., ARAÚJO, F., FERREIRA, L.A., SANTOS, J.L., "Evaluation of coupling losses in hollow-core photonic crystal fibres ", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

CALDAS, P., ARAÚJO, F., FERREIRA, L.A., REGO, G., MARQUES, M.J., SANTOS, J.L., "Study of LPG-assisted fibre modal Michelson interferometers with coherence addressing and heterodyne interrogation", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

FRAZÃO, O., MARQUES, J.A., BAPTISTA, J.M., SANTOS, J.L., "Temperature independent strain/load sensor using a highly birefingent photonic crystal fibre loop mirror", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

FRAZÃO, O., VIEGAS, J., CALDAS, P., ARAÚJO, F., FERREIRA, L.A., FARAHI, F., "In-fiber Mach-Zehnder configuration based on multimode interference combined with a long period fibre grating", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

FRAZÃO, O., CALDAS, P., SANTOS, J.L., ARAÚJO, F., FERREIRA, L.A., "Modal Interferometer based on a single non-adiabatic fiber taper", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

IVANOV, O., CALDAS, P., REGO, G., "Origin of Coupling to Antisymmetric Cladding Modes in Arc-Induced Long-Period Fiber Gratings", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

JORGE, P., SILVA, A., BENRASHID, R., SANTOS, J.L., FARAHI, F., "Simultaneous determination of oxygen and temperature using quantum dots and a ruthenium complex", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

MAYEH, M., VIEGAS, J., MARQUES, P., SANTOS, J.L., FARAHI, F., "Design and optimization of slotted multimode interference devices for chemical and biochemical sensing", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

PIMENTEL, R., BARBOSA, C., COSTA, N., RIBEIRO, D., FERREIRA, L.A., ARAÚJO, F., CALÇADA, R., "Characterization of railway traffic and its effects on a short span bridge by using a hybrid fibre optic / electrical measurement system", EWOFS 2007 - Third European Workshop on Optical Fibre Sensors 2007, Nápoles, Itália.

SANTOS, J.L., FRAZÃO, O., CALDAS, P., REGO, G., ARAÚJO, F., FERREIRA, L.A., "Novel Fibre Optic Based Structures for Sensing Applications", SBrT'07 - XXV Simpósio Brasileiro de Telecomunicações 2007, Recife - Pernanmbuco, Brasil.

R3.4.8 Other Publications

BARBOSA, C., FERREIRA, L.A., ARAÚJO, F., "Development of a High Performance Fibre Bragg Grating Based Tiltmeter", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

CARVALHO, J., MAGALHÃES, F., FRAZÃO, O., SANTOS, J.L., ARAÚJO, F., FERREIRA, L.A., "Hollow-core photonic crystal fibres for gas sensing applications", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

DE LA CRUZ, J., "Sol-Gel Preparation of Condutive Films on Fiber Optic for Electro-Optical Application", Materiais 2007 - 13th Conference of Sociedade Portuguesa de Materiais 2007, Porto, Portugal.

CALDAS, P., JORGE, P., ARAÚJO, F., FERREIRA, L.A., REGO, G., SANTOS, J.L., "Whispering Gallery Modes: device fabrication and sensing applications ", SEON 2007 - V Symposium on Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

GUERREIRO, A., "Quantum Crytography: perspectives into the future", SEON 2007 - V Symposium on Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

GONZALEZ, R., GUERREIRA, F., GUILLARÓN, J., DE LA CRUZ, J., AMORIN, H., "CONDUCTIVITY RELAXATION BEHAVIOR IN LA3+ AND TI4+ MODIFIED SBN FERROELECTRIC SYSTEM ", Materiais 2007 - 13th Conference of Sociedade Portuguesa de Materiais 2007, Porto, Portugal.

LIMA, S.E., FRAZÃO, O., FERREIRA, L.A., ARAÚJO, F., SANTOS, J.L., "Acoustic Mandrel in a Bragg Grating Sensor to Partial Discharge Detection", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

MAGALHÃES, F., CARVALHO, J., SANTOS, J.L., ARAÚJO, F., FERREIRA, L.A., "Implementation of a compact interrogation system for remote detection of methane", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

MARQUES, B., FRAZÃO, O., MENDONÇA, S.L., DE LA CRUZ, J., MARQUES, M.J., SANTOS, S.F., BAPTISTA, J.M., "Thermal Current Sensor based on Metal Coated Hi-Bi Fiber Loop Mirror ", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

MAULE, C., GONÇALVES, H., JORGE, P., SILVA, J., "Ruthenium luminescent complexes for lifetime based pH sensing ", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

MOREIRA, J., DE LA CRUZ, J., ALMEIDA, A., GUERRERO, F., AMORIN, H., "RELAXATIONAL BEHAVIOUR AND LATTICE DYNAMICS IN TI DOPED STRONTIUM BARIUM NIOBATE", Materiais 2007 - 13th Conference of Sociedade Portuguesa de Materiais 2007, Porto, Portugal.

PIMENTEL, R., BARBOSA, C., COSTA, N., RIBEIRO, D., FERREIRA, L.A., ARAÚJO, F., CALÇADA, R., "Development of a commercial fibre optic based Weight-In-Motion system for railway traffic characterization", SEON 2007 - V Symposium on Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

REGO, G., CALDAS, P., IVANOV, O., "Long-Period Gratings Arc-Induced in B/Ge Co-doped Fibers", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

SILVA, S.O., FRAZÃO, O., FERREIRA, L.A., ARAÚJO, F., SANTOS, J.L., "Interrogation of a Fibre Fabry-Pérot Cavity using a Shifted Grating ", SEON 2007 - V Symposium On Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

SILVEIRA, F., AGUILAR, G., JORGE, P., SANTOS, J.L., LEITÃO, J., SILVA, J., "Chemiluminescent silica nanoparticles for optical fiber sensing of reactive oxygen species", SEON 2007 - V Symposium on Enabling

VIEGAS, D., FRAZÃO, O., JORGE, P., GIRÃO, M., VIEGAS, J., FERREIRA, L.A., ARAÚJO, F., SANTOS, J.L., "High Resolution Optomechanical System for Micro-optical Devices ", SEON 2007 - V Symposium on Enabling Optical Networks and Sensors 2007, Aveiro, Portugal.

R3.5 LIST OF JOURNALS

Journal	Number of papers
Applied Optics	4
Applied Physics B-Lasers and Optics	1
Electronic Letters	1
IEEE Photonics Technology Letters	1
IEEE Sensors Journal	1
Materials Chemistry and Physics	1
MDPI Sensors Journal	2
Measurement Science % Technology	3
Microwave and Optical Technology Letters	3
Optical Engineering	1
Optics Communications	4
Optics Express	1
Optics Letters	3
Thin Solid Films	1
TOTAL	27

R3.6 LIST OF PATENTS

Processo de desmodulação de sensores de fibra óptica de intensidade e respectivo dispositivo

Developed under (Project Name): N/A

Demo Place: INESC Porto

Development Period: 1/6/2007 to 31/7/2007

Type (National or International): N

Submission Date: 29 October 2007

Granting Date: N/A

Interferómetro em fibra óptica

Developed under (Project Name): N/A

Demo Place: INESC Porto

Development Period: 1/1/2007 to 31/3/2007

Type (National or International): N

Submission Date: 8 November 2007

Granting Date: N/A

R3.7 LIST OF PROTOTYPES

<u>Name: High resolution interferometric imaging system</u>

Developed under (Project Name): N/A

Demo Place: INESC Porto

Development Period: 1/1/2007 to 31/12/2007

<u>Name: Optical fiber interferometer for characterization of piezoelectric thin films</u>

Developed under (Project Name): N/A

Demo Place: INESC Porto

Development Period: 1/1/2007 to 31/12/2007

R3.8 LIST OF THESES SUPERVISED BY MEMBERS OF THE UNIT DURING 2007

PhD Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Daniel Alexandre	FCUP	Paulo Marques	INESC Porto/FCUP	Fabrication of integrated optics devices by laser direct writing	2008
Dionísio Pereira	FCUP	Manuel J. Marques	INESC Porto/FCUP	Optical fiber technologies	2008
Jaime Ribeiro Viegas	FCUP	Paulo Marques	INESC Porto/FCUP	Integrated optics	2008
Orlando Frazão	FCUP	José Luís Santos	INESC Porto/FCUP	Optical fiber sensors	2008
Rui Pedro Morais	FCUP	Paulo Marques Henrique Salgado	INESC Porto/FCUP INESC Porto/FEUP	Optical fiber technology	2008
Askari Ghasempor Khordoni	FCUP	Paulo Garcia José Luís Santos	INESC Porto/FCUP	Guided Optics for Astronomic Interferometry	2009
Michael Leitner	FCUP	Carla Rosa	INESC Porto/FCUP	Optical coherence tomography	2009
Sanderson Emanuel Uchôa de Lima	FCUP	José Luís Santos Vladimiro Miranda	INESC Porto/FCUP INESC Porto/FEUP	Optical fiber sensors	2009
Cesar Maule	FCUP	Pedro Jorge Carla Rosa	INESC Porto/FCUP	Fluorescence for Optical Sensing	2010
Diana Viegas	FCUP	Francisco Araújo José Luís Santos	INESC Porto/FCUP	Microoptics	2010
Paulo Caldas	FCUP	José Luís Santos Gaspar Rego	INESC Porto/FCUP	Optical structures for environmental applications	2010
1	*2*	*3*	*4*	*5*	*6*

1 – Name of the post-graduation student

2 – Institution where the thesis is submitted; if the host institution for the student is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester

3 – Name of supervisor or supervisors

4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid

5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

MSc Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Catarina Silva	FCUP	José Luís Santos	INESC Porto/FCUP	Long period grating sensors	2007
Joel Carvalho	FEUP	Henrique Salgado	INESC Porto/FEUP	Optical Switching Techniques: Device Development and Implementation in Fibre Optic Technology	2007
Susana F. O. Silva	FCUP	José Luís Santos	INESC Porto/FCUP	Pi-phase shift fiber Bragg gratings	2007
António Valente	FCUP	Pedro Jorge	INESC Porto/FCUP	Optical fiber sensors	2008
Carla Domingues	FCUP	Carla Rosa	INESC Porto/FCUP	Optical coherence tomography	2008
1	*2*	*3*	*4*	*5*	*6*

1 – Name of the post-graduation student
2 – Institution holding the course where this student in enrolled in; if the host institution is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester
3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

R3.9 ORGANISATION OF INTERNATIONAL SCIENTIFIC EVENTS

SEON 2007 – Symposium on Enabling Optical Fiber Networks and Sensors

R3.10 ADVANCED TRAINING

Blank.

R3.11 OTHER CONTRIBUTIONS TO THE OBJECTIVES OF ASSOCIATE LABORATORY

UNIT: UOSE – OPTOELECTRONICS AND ELECTRONICS SYSTEMS	Thematic Line
Hiring of 3 PhD researchers to the areas of optical fiber sensors and micro fabrication that will increase the capacity of tutoring pre and post-graduate students in the framework of R&D and TT projects Increase of multidisciplinary of competences in optical fiber sensors for biological and environmental applications	Fiber Optic Devices and Networks for Multi-Parameter Sensing

R3.12 ANALYSIS AND ASSESSMENT OF DEVIATIONS RELATIVE TO FORMER PLANNING

R3.12.1 Comparison with strategic actions or policy lines defined in the plan of the previous year

The policy line of increasing the integration and development of PhDs in the context of the Associated Laboratory framework was fulfilled and is continuing as it is part of a pluriannual, long-term effort.

The assessment of medium/long term R&D new opportunities: negative refractive index materials; sensor networks; photovoltaic materials, was made with different degrees of depth and success. The internal project concerning photovoltaic cells based on thin films, technical feasibility evaluation, search of industrial partners and venture capital funding, was carried out and the new funding opportunities provided by QREN will take it off ground.

Despite to the fact that the Associated Laboratory status renewal process was postponed to 2008, the Unit carried out a thoughtful analysis of its performance during the contract partly in the form of a SWOT analysis. This self evaluation process will enable the preparation of a proposal of a plan for the next period.

New opportunities in technology transfer were strongly searched for with possibilities of implementation during the next year in the areas of sensing systems for the water sector, public supply and aquaculture, as well as high resolution interferometric imaging in industrial quality control systems.

R3.12.2 Cases of success, problems met, internal and external conditioning factors

The participation in the European Workshop on Optical Fiber Sensors was an achievement that induced the choice of Porto as the place for the next edition that will take place in 2010. The award of a Best Student paper to one of the Unit researchers is also an indicator of the success.

The researchers' motivation and technological infrastructure capabilities are important assets and positive conditioning factors. The level of international networking already achieved gives the Unit a visibility that has proved to be a very positive factor in getting into relevant European consortia.

The application of two national patents is also an important success. The Unit has a tradition of using intellectual property protection but for several reasons had suspended during the two previous years any application. This situation is now reversing to its traditional way. Mainly the application "Intensity optical fiber sensors demodulation process and related device" is considered to be most promising and an international application is being envisioned and assessed.

Concerning problems, the expensive running costs of a technological infrastructure is the most relevant. Secondly the splitting of activities between two locations (FCUP,FEUP), necessary for the motivation of students to engage in these activities, creates the need of replication of some equipment that single place localization will enable to profit from.

The low level of private R&D investment continues to inhibit further technology transfer projects.

The most important external factor that may have a positive or negative, yet to know, influence in the development of Unit's activity is the restructuring of Porto University R&D environment.

A very promising factor is the beginning of an MSc degree in Physics Engineering that may help to recruit students with the right profile and capacities to

The new national and European funding opportunities, QREN and FP7, are believed to enable a sustainable growth in this burgeoning area.

R4. UNIT: USE – POWER SYSTEMS

R4.1 SHORT DESCRIPTION OF THE UNIT

The Power Systems Unit focuses his activity in some of the key (emerging) areas of the electric sector: regulatory issues and electricity markets, integration of distributed independent producers (namely wind power and other renewable energy sources), technical and economic management of distribution systems, use of GIS and other IT in regional energy planning. The unit develops basic and applied research in different topics and integrating the results in models that address high level problems in a way suitable for technology transfer to vendors, utilities and companies.

The researchers developed existing know-how in techniques and methodologies like Artificial Neural Networks, Fuzzy Sets, Machine Learning techniques, Evolutionary Programming, Meta-Heuristics, Negotiation and Decision-aid methodologies etc., most of the times outside formal projects and contracts. At the same time, MSc and PhD level training remain a major objective, in order to create internal excellence in the salient research areas and to provide the industry with highly qualified professionals, capable of dealing with the challenges of new electricity sector organization. Finally, consulting activities allow the unit to promote the use of modern and efficient methodologies to manage power systems, thus contributing to the dissemination of research and development results, namely in the areas of renewable energy sources and integration of independent dispersed generation.

R4.2 ACTIVITIES DEVELOPED IN 2007

R4.2.1 National programmes

In 2007, the project VENUS and GENEDIS (FCT funded projects) were concluded.

Two other FCT funded projects (EPSO and MILES), already described in previous reports continued.

A new project, PLASM (also an FCT funded project) has started. This project intents wholesale electricity markets and agent based computational frameworks for empirical validation of emergent patterns (e.g., commercial strategies, negotiation cycles, technology adoption, etc) despite the electricity market model or design being considered.

R4.2.2 European programmes

In 2007, the new project ANEMOS PLUS was launched. The project is dedicated to the development of Advanced Tools for the Management of Electricity Grids with Large Scale Wind Generation.

The project MORE MICROGRIDS continued. This project aims at increasing the penetration of Microgeneration in electrical networks through the exploitation and extension of the Microgrids concept, involving the investigation of alternative micro generator control strategies and alternative network designs, development of new tools for multimicrogrids management operation (involving Distribution Management Systems architectures and new software adaptation) and standardization of technical and commercial protocols.

The project RISE, already described in previous reports, finished.

In the area of training, the TEMPUS project (CEFES) ended with very interesting results associated to the development of MSc innovative programs in Serbia, Bosnia i Herzegovina and FYROM.

R4.2.3 Other programmes, consulting, services

The main consulting and development activities in 2007 were the following:

- Development of new modules for the DMS/EMS system of EFACEC, in the framework of a sustained partnership of about ten years.

- Support to ONS (National System Operator of Brazil) regarding the effects of wind power integration in the transmission network and definition of technical conditions for wind generator connection to the grid.

- The project PrevEol, contracted with APREN (Portuguese Association of the Renewable Generation), in collaboration with INEGI, CESA and FCUL, was concluded. The objective of the project was the development of an advanced tool for wind power forecasting for the next 72 h, combining meteorological information and historical data.

- The project TSO-Reservas, contracted with the Iberian TSO (REN and REE), dedicated to the evaluation of the security of supply in the long term for the Iberian Peninsula and operational reserve planning until 2025, also continued.

- Conclusion of the Contract PrevC with REN (TSO of Portugal) to develop a tool dedicated to the forecast of the global load in the next 24 hours.

- Support to RAVE (High Speed Train Infrastructure Company) regarding network reinforcements to support the new high speed railroad development

- The project REN-Recep, contracted with REN (Portuguese TSO) began, with the purpose of estimating limits for the acceptance of new generation in the system nodes

- A new project contracted with EDP Distribution - INOVGRID – was launched. The project deals with intelligent metering, microgrid development support and responsive load management, in the framework of the European concept of Smart Grids

- Support to the Hungarian Electricity Regulator, through the project HEO-WIND, in the definition of acceptable levels for wind integration in Hungary

- New project contracted with ENERCON to define control parameters of wind generators for new wind parks.

R4.3 SUMMARY OF RESULTS OF THE RESEARCH ACTIVITIES OF THE TEAM MEMBERS

- **Projects**

Summary of projects developed in 2007

Type of Activity (1)	No. Projects (2)			Total Income (€)
	N	E	I	
R - Research	5	2		150.500
D - Development	4	1		360.485
C - Consulting	7	2	1	247.313
A – Advanced training	1	1		26.577
T – Technology Transfer				
O - Other	1	1		235.614
TOTAL	18	7	1	1.020.489

Summary of relative distribution of sources of income

Financing (3)	Status (4)			Total Income (€)
	S - Started	OG- On-going	C - Concluded	
NP – National Programmes	0,20%	3,92%	2,89%	71.500
EP – European Programmes	0,88%	6,86%	4,53%	125.243
CS – Consulting and Services	5,27%	24,22%	25,53%	561.555
O – Other R&D sources				
OS – Other Sources	0,92%		24,78%	262.191
Total	7,27%	35,00%	57,73%	1.020.489

Summary of projects developed in 2007

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
EFACEC	J. Pereira	D	N	CS	-	04-2001	-	OG
VENUS	M. P. Leão	R	N	NP	FCT	04-2004	04-2007	F
GENEDIS	J. Fidalgo	R	N	NP	FCT	05-2004	08-2007	F
CarCons	M. Matos	D	N	CS	-	2004	2007	F
EDA_Desp	J. P. Lopes	C	N	CS	-	2004	2008	OG
RISE	C. Monteiro	D	E	EP	INCO	01-2005	11-2007	F
ONS	J. P. Lopes	C	I	CS	-	05-2005	04-2008	OG
EPSO	V. Miranda	R	N	NP	FCT	07-2005	04-2008	OG
MILES	J. Pereira	R	N	NP	FCT	07-2005	06-2008	OG
Eolica-concurso	J. P. Lopes	C	N	CS	-	2005	2007	F
Ren-Prevc	J. N. Fidalgo	D	N	CS	-	2005	2007	F
More-MGrids	J. P. Lopes	R	E	EP	NNE	2006	12-2009	OG
PrevEol	C. Monteiro	D	N	CS	-	2006	2008	OG
TSO-reservas	M. Matos	C	E	CS	-	2006	2007	F

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
Anemos Plus	J. P. Lopes	R	E	EP	TREN	2007	2008	S
Coord. EES-UETP	J. P. Lopes	O	E	OS	-	2007	2009	S
Conf.Microg.	J. P. Lopes	A	N	OS	-	2007	2007	F
CONSULTORIA	J. P. Lopes	C	N	CS	-	2007	2007	F
EES-UETP	J. T. Saraiva	A	E	OS	-	2007	2008	S
ENERCOM	J. P. Lopes	C	N	CS	-	2007	2008	S
ENERGIA	M. Matos	O	N	OS		2007	2007	F
HEO- wind	J. P. Lopes	C	E	CS	-	2007	2008	S
InovGrid	J. P. Lopes	C	N	CS	-	2007	2009	S
PLASM	V. Miranda	R	N	NP	FCT	2007	09-2010	S
RAVE	J. P .Lopes	C	N	CS	-	2007	2008	S
REN-Recep	J. P. Lopes	C	N	CS	-	2007	2008	S

(1) Type of Project: R – Research; D – Development; C – Consulting; A – Advanced Training; T – Technology Transfer; O - Other

(2) Degree of internationalization: N – National; E – European; I – International *(Select one)*

(3) Source of financing: NP – National Programmes; EP – European Programmes; CS – Consulting and services; O – Other R&D financing sources; OS – Other sources

(4) Status: S – Starting: activities initiated in 2007 and continuing in 2008; OG – On-going: activities started earlier than 2007 and continuing in 2008; F – Finished: activities ending in 2007.

- **Summary of publications**

Summary of publications in 2007

Type of publication	Number
Theses concluded in 2007 by members of the unit	3
Books (author)	
Chapter/paper in books	3
Publications (editor)	
Papers in International Journals with scientific referees	20
Papers in National Journals with scientific referees	1
Conference Proceedings in events with scientific referee and selection	34
Other publications (National meetings, local journals, etc.)	
Total	61

- **Summary of post-graduation activities**

Summary of theses supervised by members of the unit in 2007

Type	Starting	On-going	Concluded	Total
Master	5	13	1	19
Doctoral	3	10	3	16
Total	8	23	4	35

(*) This number may be very different under the new Bologna Integrated Master Courses.

- **Summary of Advanced Training Actions**

Summary of Advanced Training Actions organized for external trainees in 2007

Type	Number
Training for graduation students *(estágios curriculares)*	4
Training for others *(estágios extra-curriculares)*	1
Professional training actions *(estágios profissionais)*	1
Other actions	
Total	6

(*) This number may be very different under the new Bologna Integrated Master Courses

- **Summary of activities of cooperation or dissemination**

Summary of items

Type	Number
Organizing conferences or meetings	1
Collaboration in papers authored by INESC Porto researchers	45
External persons directly involved in actions organized by INESC Porto	

- **Human resources in 2007**

Summary of Unit personnel at the end of 2007

Type	Education				Total	Variation (*)
	PhD.	MSc.	BSc.	Other		
R&D						
University or Polytechnic Staff	10	3			13	+1
INESC Porto Grant Holders		1	4	1	6	-5
Other Grant Holders	2	6	3		11	+1
Employees		1		1	2	+1
Trainees		1	1	1	3	+1
Other	1	3			4	0
Administrative				1	1	0
Total	13	15	8	4	40	-1

(*) Relative to 2006, in absolute numbers.

R4.4 LIST OF PUBLICATIONS

R4.4.1 Theses concluded in 2007 by members of the unit

Resende, Fernanda, Identification of Control Procedures in Micro-Generation Islanding Conditions, PhD Thesis, Faculdade de Engenharia da Universidade do Porto, December, 2007.

Vascondelos, Maria Helena, Identification of Efficient Preventive Control Procedures Exploiting Security Evaluation Structures Derived using Machine Learning Techniques, PhD Thesis, Faculdade de Engenharia da Universidade do Porto, December, 2007.

Gomes, Mário Helder, New Mechanisms for Electricity and Ancillary Services Markets, PhD Thesis, Faculdade de Engenharia da Universidade do Porto, June, 2007.

R4.4.2 Books (Author)

Blank.

R4.4.3 Chapter/paper in Books

MIRANDA, V., KEKO, H., DUQUE, A., "EPSO: Evolutionary Particle Swarms", Advances in Evolutionary Computing for System Design, vol.66, pp.139-168, Springer Berlin / Heidelberg, July 2007.

FIDALGO, J.N., MATOS, M. A., "Forecasting Portugal global load with artificial neural networks", Artificial Neural Networks – ICANN 2007, Lecture Notes on Computer Science, Vol: 4669, 728-737, Springer-Verlag, 2007.

MATOS, M. A., "Cross-cut notes about decision-aid" [Notas transversais sobre ajuda à decisão], in Antunes, CH and Dias, LC (ed), Decision: interdisciplinary perspectives [Decisão: perspectivas interdisciplinares], Imprensa da Universidade de Coimbra, 151-171, Coimbra, 2007.

R4.4.4 Publications (Editor)

Blank.

R4.4.5 International Journals with scientific referees

HILBER, P., MIRANDA, V., MATOS, M., BERTLING, L., "Multiobjective Optimization Applied to Maintenance Policy for Electrical Networks", IEEE Transactions on Power Systems, vol.22, no.4, p.1675-1682, November 2007.

MIRANDA, V., MOREIRA, A., PEREIRA, J., "An Improved Fuzzy Inference System for Voltage/VAR Control", IEEE Transactions on Power Systems, vol.22, no.4, p.2013-2020, November 2007.

SCHWEICKARDT, G., MIRANDA, V., "Un Modelo De Planificación Y Control Orientado A La Adaptación Económica De Sistemas De Distribución De Energía Eléctrica" [A Planning and Control Model Targeting Economically Adapted Power Distribution Systems], Investigación Operativa,nº 28, November, 2007.

MATOS, M., "Decision under risk as a multicriteria problem", European Journal of Operational Research, vol.181, no.3, p.1516-1529, September 2007.

ALMEIDA, R., LOPES, P., "Participation of Doubly Fed Induction Wind Generators in System Frequency Regulation", IEEE Transactions on Power Systems, vol.22, no.3, p.944-950, August 2007.

DE OLIVEIRA-DE JESUS, P.M., DE LEÃO, T.P., KHODR, H., "Network Cost Loss Allocation Methods Evaluation under the Perspective of the Social Welfare Theory", International Journal of Global Energy Issues, vol.28, no.1, p.11-31, August 2007.

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R4.4.8 Other Publications

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R4.5 LIST OF JOURNALS

Journal	Number of papers
Electric Power Systems Research	3
European Journal of Engineering Education	1
European Journal of Operational Research	1
European Transactions on Electrical Power	1
IEEE Transactions on Energy Conversion	1
IEEE Transactions on Power Systems	5
International Journal of Electrical Power & Energy Systems	1
International Journal of Global Energy Issues	2
Investigación Operativa	1
Latin American Applied Research	1
Renewable Energy Journal	1
Transmission and Distribution World	1
Wind Energy	1
TOTAL	20

R4.6 LIST OF PATENTS

Blank.

R4.7 LIST OF PROTOTYPES

<u>Reserve evaluation tool</u>

Developed under TSO-Reservas
Demo Place: INESC Porto
Development Period: 2006-2007

<u>MORE_CARE EDA</u>

Developed under EDA
Demo Place: EDA – Island of Flores
Development Period: 2006-2007

<u>MMG Dynamic Simulation Platform</u>

Developed under More_Microgrids EU Project
Demo Place: INESC Porto
Development Period: 2006-2007

R4.8 LIST OF THESES SUPERVISED BY MEMBERS OF THE UNIT DURING 2007

PhD Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Fernanda Resende	FEUP	João Peças Lopes	INESC Porto/FEUP	Identification of Control Procedures in Micro-Generation Islanding Conditions	2007
Maria Helena Vasconcelos	FEUP	João Peças Lopes José Nuno Fidalgo	INESC Porto/FEUP	Identification of Efficient Preventive Control Procedures Exploiting Security Evaluation Structures Derived using Machine Learning Techniques	2007
Mário Helder Gomes	FEUP	João Tomé Saraiva	INESC Porto/FEUP	New Mechanisms for Electricity and Ancillary Services Markets	2007
Ângelo Mendonça	FEUP	João Peças Lopes	INESC Porto/FEUP	Development of Robust Control Systems for Stabilizing Power Oscillations in Systems with Large Scale Wind Power Integration	2008
Carlos Moreira	FEUP	João Peças Lopes	INESC Porto/FEUP	Identifying and Developing Emergency Procedures for the Operation of Micro-Generators in Isolated Grids and Participation in Black-Start Strategies	2008
Eduardo Gouveia	FEUP	Manuel Matos	INESC Porto/FEUP	Development and Evaluation of Investment Plans for the Transmission Activity in a Liberalized Environment	2008
Francisco Font Bell	FEUP	João Tomé Saraiva	INESC Porto/FEUP	Planning the Expansion and Reinforcement of Electric Networks Considering Uncertainties Related with the Generations Assets	2008
Mauro da Rosa	FEUP	Vladimiro Miranda	INESC Porto/FEUP	Reliability of Power Systems with distributed generation	2008

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Nuno Gil	FEUP	João Peças Lopes	INESC Porto/FEUP	Elaboration of Procedures and Criteria for Definition of Limits of Eligibility of Acceptance of Renewable Production in Isolated Networks	2008
Paulo Jesus	FEUP	Maria Teresa de Ponce Leão	INESC Porto/FEUP	Remuneration of distributed generation: a holistic approach	2008
Paulo Mendes da Silva	FEUP	Maria Teresa de Ponce Leão	INESC Porto/FEUP	Integrated Methodologies for Distribution Planning	2008
Paulo Moisés	FEUP	Manuel Matos	INESC Porto/FEUP	Regulation and Planning of Electric Distribution Systems	2008
Pedro Marques	FEUP	João Peças Lopes	INESC Porto/FEUP	Dynamic security assessment in interconnected power systems with large scale integration of wind generation	2008
Adelino Pereira	FEUP	João Tomé Saraiva	INESC Porto/FEUP	Reference Planning of the Expansion of the Power Generating System in a Market Environment	2009
André Madureira	FEUP	João Peças Lopes	INESC Porto/FEUP	Coordinated and Optimized Management of Distribution Networks with Multi-Microgrids	2009
Bruno Gomes	FEUP	João Tomé Saraiva	INESC Porto/FEUP	Uncertainty Modelling in Generating Costs and Load Powers in Market Mechanisms and in the Calculation of Nodal Marginal Prices in Power Systems	2009
1	2	3	4	5	6

1 – Name of the post-graduation student
2 – Institution where the thesis is submitted; if the host institution for the student is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester
3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

MSc Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
José António Simões	FEUP	João Tomé Saraiva	INESC Porto/FEUP	Optimal Power Flow Model Using Sequential Linear Programming	2007
André Moreira	FEP	Jorge Pereira	INESC Porto/FEP	Market Simulation	2008
António Ferreira Santos	FEUP	João Peças Lopes	INESC Porto/FEUP	Analysis of the Behavior of the Power Network of Porto Refinery - Petrogal	2008
Célia Tenente	FEUP	Cláudio Monteiro	INESC Porto/FEUP	Project optimization of Building Integrated Photovoltaics	2008
Daniel Castro	FEUP	Manuel Matos	INESC Porto/FEUP	Simulation of Intelligent Active Distributed Networks	2008
Filipe Tadeu Oliveira	FEUP	Manuel Matos	INESC Porto/FEUP	Investments and quality of service in regulated electric distribution systems	2008
Helena Maria Soares	FEUP	Cláudio Monteiro	INESC Porto/FEUP	Small Wind Turbines Integration in Urban Environment	2008
Joana Reis	FEUP	Manuel Matos	INESC Porto/FEUP	The use of Fuzzy Inference Systems enables the creation of more transparent Decision Support Systems	2008
João Guincho	FEUP	João Tomé Saraiva	INESC Porto/FEUP	Marginal Remuneration of RNT - Evaluation from 1998 to 2005	2008

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
João Nuno Sousa	FEUP	Cláudio Monteiro	INESC Porto/FEUP	Modeling of Short-term Wind Power Forecasting	2008
José Carlos Sousa	FEUP	João Tomé Saraiva	INESC Porto/FEUP	Estimate of the Remuneration of Hydro Station in Electricity Markets	2008
José Luís Pascoal	FEUP	Cláudio Monteiro	INESC Porto/FEUP	Geocomputational Reliability Analysis of Power Distribution Systems	2008
Marco Paulo Ferreira	FEUP	Manuel Matos	INESC Porto/FEUP	Fast evaluation of the security of supply at the Generation level	2008
Mário de Sousa Neto	FEUP	Cláudio Monteiro	INESC Porto/FEUP	Remuneration of renewable energy technologies	2008
Pedro Brito Parreira	FEUP	Cláudio Monteiro Vladimiro Miranda	INESC Porto/FEUP	Error Distribution Optimization of Wind Power Forecasting Models	2008
Pedro Lima	FEUP	Cláudio Monteiro	INESC Porto/FEUP	Optimization of Large Photovoltaic Power Plants.	2008
Ricardo Bessa	FEP	João Gama	INESC Porto/FEP	Wind Power Forecasting Based on Information Entropy-Related Concepts and Data Stream Techniques	2008
Ricardo Ferreira	FEUP	Manuel Matos	INESC Porto/FEUP	Reserve adequacy in Power Systems with a high penetration of wind power	2008
Tiago Morais	FEUP	João Peças Lopes	INESC Porto/FEUP	Study of the operation of wave energy conversion systems	2008
1	2	3	4	5	6

1 – Name of the post-graduation student
2 – Institution holding the course where this student in enrolled in; if the host institution is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester
3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

R4.9 ORGANISATION OF INTERNATIONAL SCIENTIFIC EVENTS

Organization of a conference on "Microgeneration and the change of paradigm of the electric energy system", organized in Lisbon in 13th March 2007.

R4.10 ADVANCED TRAINING

The course Tariffs and Regulation in the Electricity Sector, was held at EDA in Ponta Delgada, Azores from the 7th to 9th of May, 2007.

The course programme committee of the advanced European training consortium EES/UETP is now chaired by Prof. Peças Lopes, being the responsibility of the coordination of the training activities assigned to the Power Systems Unit of INESC Porto.

R4.11 OTHER CONTRIBUTIONS TO THE OBJECTIVES OF ASSOCIATE LABORATORY

UNIT: USE – POWER SYSTEMS	Thematic Line
Support to evaluation phase of the international public tender for new wind generation connection points in Portugal	Electric sector and integrated territorial
Support to public and institutional entities in performing studies and consulting	

actions related to the development of public policies for energy	planning
Participation in the advisory board of the "Technological Plan", a government initiative	
Participation in the implementation of the projects MIT-Portugal (Energy and Sustainability area) and CMU-Portugal, launched by the portuguese government	
Participation in the Mirror Group of the SmartGrids European Technology Platform.	
Participation in the steering committee of the group that supported the Portuguese presidency of the EU in the preparation of the SET Plan	

R4.12 ANALYSIS AND ASSESSMENT OF DEVIATIONS RELATIVE TO FORMER PLANNING

R4.12.1 Comparison with strategic actions or policy lines defined in the plan of the previous year

Most of the important work developed in 2007 was already launched in the previous years, following the strategic options for the Power Systems Unit defined previously. The new important projects started in 2007 are also consistent with the general policy of the unit and its areas of expertise.

R4.12.2 Cases of success, problems met, internal and external conditioning factors

The successful conclusion of the public tender for new wind generation (total: 1600 MW) and related investments in industrial facilities (total: >2000 million euros), where the unit played an important role (support to the definition of technical criteria, Presidency of the Jury and support to the decision making process) was an important moment of 2007.

The new projects (some of them international) showed an increasing recognition of the unit's know-how and skills and also validate strategic decisions of the recent years regarding the focus in areas like microgrids and wind power control.

The main challenge of the unit now is to maintain a coherent basis of human resources able to cope with the many requests for collaboration and consultancy, without endangering the scientific research and development work.

R5. UNIT: USIC – INFORMATION AND COMMUNICATIONS SYSTEMS

R5.1 SHORT DESCRIPTION OF THE UNIT

The Information and Communication Systems Unit (USIC) is mainly involved in Advanced Information Systems Engineering, with some activities in Communication Systems Engineering and Strategic IT Consulting. Its main R&D areas are Location Based Information Systems Engineering and Software Engineering.

The Unit performs several types of activity, namely: research, development, technology transfer, consulting, auditing and advanced training.

These activities are carried out in several sectors. Important partners and clients may be referenced in the following areas: telecommunications, local administration, industry, commerce, healthcare, ship building and Central and Regional Government. The most relevant application area in the past years has been eGovernment.

The Unit is composed by a heterogeneous team, with skills in diversified areas: computer systems, office automation, telecommunications, computing sciences, software engineering and geographic engineering. This mix is complemented by a group of academic researchers active in Advanced Information Systems Engineering that lead USIC's scientific activities.

Its mission is to contribute to the modernization of enterprises and institutions using advanced ICT solutions. Our challenge is to link market needs with research objectives, creating innovative solutions based on excellent research results.

R5.2 ACTIVITIES DEVELOPED IN 2007

R5.2.1 National programmes
IVY- A model-based usability analysis environment - POSC/EIA/56646/2004 (FCT) – Development of a model based tool for the analysis of interactive systems.

R5.2.2 European programmes
e-ASLA - INTERREG III B - Definition of one Framework for Open Source and Commercial Software integration to support the administrative processes in Small Local Authorities (with less than 20.000 inhabitants) with multilingual support.

CAALYX- Complete Ambient Assisted Living Experiment – 6FP-IST - CAALYX's main objective is to develop a wearable light device able to measure specific vital signs of the older person, to detect falls and to communicate automatically in real time with his/her caregiver in case of an emergency, wherever the older person happens to be, at home or outside.

R5.2.3 Other programmes, consulting, services

IVDP-Consulting on Geographic Information Systems for agriculture area particularly for Porto and Douro wine industry.

SIGEP - Specific GIS developments for the Oporto's Emergency Management Integrated System, for Oporto's Civil Government (local representation of the Home Office Ministry).

SIVIDA - Specification of an Information System for AIDS data collection and processing, for the Healthcare High Commissioner.

PROT-OVT – Platform for the elaboration and public discussion of a regional master plan (Oeste e Vale do Tejo) and participation in the thematic working group ICT for the same regional master plan.

CCRDN-TIC – Process modelization/reengineering and specific GIS developments for internal management application of the Norte Regional Coordination and Development Commission, the regional branch of the Environment, Territory Planning and Regional Development Ministry.

SEGALAB – Modernization of SEGALAB Information System, including activities such as business process modeling and reengineering, specification, technology transfer and training. Innovative approaches are planned such as inclusion collaboration with customers and suppliers via Web and mobility support for field teams. SEGALAB is a laboratory specialized in food and veterinary tests.

Cabo Madeira -Viability study of a Macaronesia telecommunications submarine cable.

PORTMOS – Integration of the Portuguese Ports and Maritime System in the Motorways of the Sea. Contribution to business process modeling and reengineering of port shipping processes.

Porto 3D – Specification and implementation of a geographical base for the generation of Porto's virtual model.

GEXP – Updating and extension of an application for land expropriation management for Metropolitano do Porto.

SAGAWEB - Reengineering of SAGA CASE tool, keeping business rules and enabling the creation of web 2.0 based applications.

RCM – Participation in the Mobility Excellence Network, which involves several companies and institutions involved in the area of Mobility (Public Transport, Planning, Software Houses, etc).

CEDT – Participation in the Transaction Dematerialization Excellence Network, which involves several enterprises producing products and services with an important software component and focused on the virtualization of business transactions.

EOLOS – Specification and implementation of a framework for radio electric coverage interference analysis caused by wind generators parks.

R5.3 SUMMARY OF RESULTS OF THE RESEARCH ACTIVITIES OF THE TEAM MEMBERS

- **Projects**

Summary of projects developed in 2007

Type of Activity (1)	No. Projects (2)			Total Income (€)
	N	E	I	
R - Research	1	2		139.324
D - Development	6			92.757
C - Consulting	8	1		307.253
A – Advanced training				
T – Technology Transfer				
O - Other				
TOTAL	15	3		539.334

Summary of relative distribution of sources of income

Financing (3)	Status (4)			Total Income (€)
	S - Started	OG– On-going	C - Concluded	
NP – National Programmes	1,32%			7.103
EP – European Programmes	19,22%		6,61%	139.324
CS – Consulting and services	7,28%	29,70%	35,87%	392.907
O – Other R&D sources				
OS – Other sources				
Total	27,82%	29,70%	42,48%	539.334

Summary of projects developed in 2007

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
IMOPPI	Rui Barros	C	N	CS	-	03-2003	03-2007	OG
e-ASLA	Rui Barros	R	E	EP	Interreg	02-2005	06-2007	OG
m-GIS	Artur Rocha	T	N	CS	PT IN	03-2005	04-2006	F
Consultadoria	P.Monteiro	C	N	CS	-	01-2006	-	OG
Invicta TV	José Correia	D	N	CS	InvictaTV	03-2006	-	OG
PROT-N	A.Gaspar	C	N	CS	CCDRN	12-2006	06-2008	S
LINK-IVDP	Artur Rocha	C	N	CS	LINK	04-2006	12-2006	F
Geoforum	Artur Rocha	D	N	CS	Medidata	02-2006	12-2007	S
UPTV	J.P.Rodrigues	D	N	CS	UP	01-2006	12-2006	F
SIGCMP	A. Carvalho	D	N	CS	CMP	01-2006	03-2007	S
SIGEP	Artur Rocha	D	N	CS	GCP	07-2006	12-2006	F
SIVIDA	José Correia	C	N	CS	ACS	07-2006	01-2007	S
PROT-OVT	A. Gaspar	C	N	CS	CCDR-LVT	07-2006	12-2007	S
POAP CCDRN	Artur Rocha	C	N	CS	CCDR-N	12-2006	12-2007	S
SEGALAB	A. Gaspar	C	N	CS	Segalab	10-2006	12-2007	S

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
PROT C	A Gaspar	C	N	CS	CCDR-C	12-2006	12-2007	S
CoopNav	A.Gaspar	R	E	EP	Interreg	10-2004	06-2006	F

(1) Type of Project: R – Research; D – Development; C – Consulting; A – Advanced Training; T – Technology Transfer; O - Other

(2) Degree of internationalization: N – National; E – European; I – International *(Select one)*

(3) Source of financing: NP – National Programmes; EP – European Programmes; CS – Consulting and services; O – Other R&D financing sources; OS – Other sources

(4) Status: S – Starting: activities initiated in 2007 and continuing in 2008; OG – On-going: activities started earlier than 2007 and continuing in 2008; F – Finished: activities ending in 2007.

- **Summary of publications**

Summary of publications in 2007

Type of publication	Number
Theses concluded in 2007 by members of the unit	
Books (author)	
Chapter/paper in books	
Publications (editor)	2
Papers in International Journals with scientific referees	1
Papers in National Journals with scientific referees	
Conference Proceedings in events with scientific referee and selection	7
Other publications (National meetings, local journals, etc.)	
Total	10

(*) papers co-authored with researchers of other Units

- **Summary of post-graduation activities**

Summary of theses supervised by members of the unit in 2007

Type	Starting	On-going	Concluded	Total
Master	5	8	7	20
Doctoral	2	3	1	6
Total	7	11	8	26

- **Summary of Advanced Training Actions**

Summary of advanced training actions organized for external trainees in 2007

Type	Number
Training for graduation students *(estágios curriculares)*	2
Training for others *(estágios extra-curriculares)*	
Professional training actions *(estágios profissionais)*	
Other actions	3

Type	Number
Total	5

- **Summary of activities of cooperation or dissemination**

Summary of items

Type	Number
Organizing conferences or meetings	4
Collaboration in papers authored by INESC Porto researchers	21
External persons directly involved in actions organized by INESC Porto	

- **Human resources in 2007**

Summary of Unit personnel at the end of 2007

Type	Education				Total	Variation (*)
	PhD.	MSc.	BSc.	Other		
R&D						
University or Polytechnic Staff	4	1			5	-2
INESC Porto Grant Holders			4		4	+2
Other Grant Holders						
Employees		2	9		11	-1
Trainees					0	0
Other			1		1	0
Administrative			1		1	0
Total	4	3	15		22	-1

(*)   Relative to 2006, in absolute numbers.

R5.4 LIST OF PUBLICATIONS

R5.4.1 Theses concluded in 2007 by members of the unit
Blank.

R5.4.2 Books (Author)

Blank.

R5.4.3 Chapter/paper in Books

Blank.

R5.4.4 Publications (Editor)

RAMALHO, J., CORREIA LOPES, J., CARRIÇO, L., "Actas da XATA2007- XML: Aplicações e Tecnologias Associadas", *XATA2007 - XML: Aplicações e Tecnologias Associadas*, February 2007, ISBN-978-972-99166-4-9, Lisboa, Portugal.

DAYDÉ, M., PALMA, J.M., COUTINHO, A.L., PACITTI, E., CORREIA LOPES, J., "Proceedings da Vecpar 2006- High Performance Computing for Computational Science", *VECPAR 2006 - The 7th International Conference on High-Performance Computing for Computational Science,* 2007, LNCS, vol.4395, Rio de Janeiro, Brasil.

R5.4.5 International Journals with scientific referees

BOULOS, M.N.K., ROCHA, A., MARTINS, Â., VICENTE, M.E., BOLZ, A., FELD, R., TCHOUDOVSKI, I., BRAECKLEIN, M., NELSON, J., LAIGHIN, G.O., SDOGATI, C., CESARONI, F., ANTOMARINI, M., JOBES, A., KINIRONS, M., "CAALYX: a new generation of location-based services in healthcare", International Journal of Health Geographics, March 2007, vol.6, no.9.

R5.4.6 National Journals with scientific referees

Blank.

R5.4.7 Conference Proceedings with scientific referees

AGUIAR, A., DAVID, G., "Patterns for Documenting Frameworks - Process", *SugarLoafPLoP'2007 - SugarLoafPLoP'2007- 6º Latin America Conference on Pattern Languages of Programming* 2007, AnaisSugar 2007-Parte I - Writer´s Workshop, Porto de Galinhas, Brasil , p.150-161.

CRUZ, A.M., PASCOAL FARIA, J., "Automatic Generation of User Interfaces from Domain and Use Case Models", *SEDES 2007-QUATIC2007 - Software Engineering Doctoral Consortium* 2007, Proceedings of Quatic2007- 6th International Conference on the Quality of Information and Communication Technology, Lisboa, Portugal, p.208-212.

MONTEIRO, M., AGUIAR, A., "Patterns for Refactoring to Aspects: an incipient Pattern Language", *PLop 2007 - 14th Conference on Pattern Languages of Programs* 2007, Monticello, Estados Unidos America.

RESTIVO, A.,AGUIAR, A.,"Towards Detecting and Solving Aspect Conflicts and Interferences Using Unit Tests", *AOSD'2007 - AOSD'2007, SPLAT Workshop - Software Engineering Properties of Languages and Aspect Technologies* 2007, Vancouver, Canadá.

QUARRIE, P., BOULOS, M.N.K., VICENTE, M.E., ROCHA, A., FELD, R., NELSON, J., SDOGATI, C., RODRIGUEZ, A., JOBES, A., "CAALYX: Location Independent healthcare for the elderly", *RAATE2007 - Recent Advances in Assistive Technology & Engineering 2007*, Proceedings RAATE2007, Sheffield, Reino Unido.

PAIVA, A.C., PASCOAL FARIA, J., MENDES, P.M., "Reverse Engineered Formal Models for GUI Testing", *FMICS 2007 - 12th International Workshop on Formal Methods for Industrial Critical Systems* 2007, LNCS,vol. 4916, Berlim, Alemanha.

PAIVA, A.C., PASCOAL FARIA, J., VIDAL, R.F., "Towards the Integration of Visual and Formal methods for GUI Testing", *MBT 2007 - Third Workshop on Model Based Testing* 2007, ENTCS, vol.16701, Braga, Portugal.

R5.4.8 Other Publications

Blank.

R5.5 LIST OF JOURNALS

Journal	Number of papers
International Journal of Health Geographics	1
TOTAL	1

R5.6 LIST OF PATENTS

Blank.

R5.7 LIST OF PROTOTYPES

<u>Name: Framework e-ASLA</u>

Developed under (Project Name): e-ASLA- e-Administration for Small Local Authorities

Demo Place: Portugal , Espanha , França

Development Period: 2005-2007

<u>Name: Framework for evaluation of radio electric coverage interference caused by wind generator parks</u>

Developed under (Project Name): EOLOS

Demo Place: Portugal (several wind generator parks)

Development Period: 2007-2009

R5.8 LIST OF THESES SUPERVISED BY MEMBERS OF THE UNIT DURING 2007

PhD Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Ana Cristina R. Paiva	FEUP	Raúl Vidal João Pascoal Faria	FEUP INESC Porto/FEUP	Automated specification based-testing of graphical user interfaces	2007
André Restivo	FEUP	Ademar Aguiar Ana Moreira	INESC Porto/FEUP UNL/FCT	Disciplined Reuse of Aspect-Oriented Software	2009
António Miguel R.S.R. Cruz	FEUP	João Pascoal Faria	INESC Porto/FEUP	Automatic Generation of User Interfaces from Domain and Use Case Models	2009
Artur Rocha	FEUP	Ademar Aguiar Augusto Sousa	INESC Porto/FEUP	Cooperative and Distributed Location-Based Decision Support	2009
Daniel Oancea	FEUP	João Correia Lopes Rui Moreira	INESC Porto/FEUP INESC Porto/UFP	Adaptive Multimedia Components in Distributed Environments	2009
Pedro Miguel Correia Mendes	FEUP	João Pascoal Faria Ana Paiva	INESC Porto/FEUP FEUP	Automatic Graphical User Interface Testing Based on UML Behavioral Models	2009
1	2	3	4	5	6

1 – Name of the post-graduation student

2 – Institution where the thesis is submitted; if the host institution for the student is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester

3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

MSc Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Filipe Teixeira Campos	FEUP	Ademar Aguiar	INESC Porto/FEUP	Estudo de arquitecturas e desenvolvimento de ferramentas em plataformas Mobile para sistemas SCADA	2007
Jorge Esparteiro Garcia	FEUP	Rui Camacho João Correia Lopes	FEUP INESC Porto/FEUP	Web assistant for collaborative and automatic data analysis- The WebCAD system	2007
José Manuel Rios Fonseca	FEUP	Ademar Aguiar João Saraiva	INESC Porto/FEUP UMinho	Interactive Decompilation	2007
Paulo Alexandre R. Cunha Fernandes	FEUP	João Pascoal Faria	INESC Porto/FEUP	Independência de Fonte de Dados e Gestão de Alterações em Editores de Diagramas de Redes	2007
Rui Reis Gomes	FEUP	João Pascoal Faria	INESC Porto/FEUP	Testes de interfaces de Voz	2007
Sara Campos de Araújo	FEUP	João Pascoal Faria José M. Cruz	INESC Porto/FEUP	Segurança na circulação de Informação clínica	2007
Vitor Manuel R.M.Rodrigues	FEUP	João Correia Lopes	INESC Porto/FEUP	On the Specication of Spacecraft Simulators	2007
Bruno Miguel Meira Pestana	FEUP	João Correia Lopes Maria João Silva	INESC Porto/FEUP ESE/IPP	Interfaces Lúdicas para Comunicação Multissensorial Ubíqua no 1º ciclo do Ensino Básico	2008
Joana Rodrigues Coelho de Sousa	FEUP	João Correia Lopes Almiro Amorim	INESC Porto/FEUP ESAD	Publicidade como Evento/Instalação Tecno-Artística	2008
Licínio Venâncio Feiteira Mano	FEUP	Ademar Aguiar	INESC Porto/FEUP	PUSL - Plataforma Unificada de Serviços de Localização para Situações de Crise ou Emergência	2008
Lígia Alexandra F. Silva	FEUP	Paulo Pinho Ademar Aguiar	FEUP INESC Porto	Modelo de Ordenamento do Território	2008
Nuno Miguel Moreira Baldaia Queiroz	FEUP	Ademar Aguiar	INESC Porto/FEUP	Extending Eclipse to Support Agile Documentation	2008
Pedro Castro Henriques	FEUP	João Falcão Cunha Pascoal Faria	FEUP INESC Porto/FEUP	Planeamento Estratégico e Arquitectura do SIERS-Sistema de Informação da Entidade Reguladora da Saúde	2008
Ricardo Ferreira Rodrigues Pinto	FEUP	Ademar Aguiar	INESC Porto/FEUP	Audit Documentation Framework	2008
Rui Barros	FEUP	Ademar Aguiar	INESC Porto/FEUP	Definição de uma Framework para Municípios de Pequena Dimensão	2008
Vagner David Pinto Morais	FEUP	João Pascoal Faria	INESC Porto/FEUP	Web-Based Build, Configuration and Testing Tool for a Grid Application	2008
André Lessa	FEUP	João Pascoal Faria	INESC Porto/FEUP	CMMI Metrics Solution	2009
António José T.Gaspar	FEUP	João Pascoal Faria	INESC Porto/FEUP	O Alinhamento dos Processos de Negócio com os Sistemas de Informação e com as Boas Práticas na Administração Pública: o papel dos modelos na auditoria aos Sist Inf.	2009
Gilles Rodrigues	FEUP	João Pascoal Faria	INESC Porto/FEUP	Estudo da plataforma Rational Software Architect (RSA) para abordagens Model Driven Development (MDD)	2009
Hernâni Fernandes	FEUP	João Pascoal Faria	INESC Porto/FEUP	Reengenharia de Ferramenta de Desenvolvimento Rápido de Aplicações para Ambiente Web 2.0	2009

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
1	*2*	*3*	*4*	*5*	*6*

1 – Name of the post-graduation student

2 – Institution holding the course where this student in enrolled in; if the host institution is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester

3 – Name of supervisor or supervisors

4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid

5 – Title of the thesis

6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

R5.9 ORGANISATION OF INTERNATIONAL SCIENTIFIC EVENTS

WIKISYM 2007 – 2007 International Symposium on Wikis
Montréal-Québec, Canada, October 21– 23, 2007
Ademar Aguiar – Organizer of the "Wikis for Software Engineering Workshop"

QUATIC 2007 – 6th International Conference on the Quality of Information and Communications Technology
Lisboa, Portugal. September 12– 14, 2007
João Pascoal Faria – Workshops co-chair and TEQUA 2007 Workshop chair

PLOP 2007 – 14th Conference on Pattern Languages of Programs
Monticello-Illinois, USA, September 5-8, 2007
Ademar Aguiar – Conference Chair

XATA 2007 – XML: Aplicações e Tecnologias Associadas
Lisbon, Portugal, February 15-16, 2007
João Correia Lopes - Organizing Committee; Proceedings Editor

R5.10 ADVANCED TRAINING

Blank.

R5.11 OTHER CONTRIBUTIONS TO THE OBJECTIVES OF ASSOCIATE LABORATORY

UNIT: USIC - INFORMATION AND COMMUNICATIONS SYSTEMS	Thematic Line
Platforms for the elaboration and discussion of regional master plans (PROT) for CCDR - Lisboa e Vale do Tejo, CCDR - Centro and CCDR – Norte.	Power Sector and Integrated Territorial Planning
Emergency management system (implementation of GIS components)	Power Sector and Integrated Territorial Planning
CCDRN-TIC Process modelization/reengineering and specific GIS developments for internal management application of the Norte Regional Coordination and Development Commission, the regional branch of the Environment, Territory	Power Sector and Integrated Territorial

Planning and Regional Development Ministry. Collaborative platform for the implementation of Lisbon region development strategic plan "Lisboa 2020"	Planning Power Sector and Integrated Territorial Planning

R5.12 ANALYSIS AND ASSESSMENT OF DEVIATIONS RELATIVE TO FORMER PLANNING

R5.12.1 Comparison with strategic actions or policy lines defined in the plan of the previous year

In 2007 the Unit suffered a major drawback in its effort to reinforce research activities with the loss of two PhDs. However it was possible to achieve a positive financial balance, with an increase in consultancy, technology transfer and research activities.

The publication level decreased, since the publication results of the above mentioned PhDs were not consolidated in 2007 as USIC activities. Nevertheless this level in 2007 is slight higher than it was prior to their arrival in 2005, however it still needs to be further improved.

A European proposal was submitted in the eGov area but was not successful. Several partnerships with national companies were established, which have resulted in national submissions at the beginning of 2008 (QREN).

An effort has been made to jointly develop projects with LIAAD, complementing USIC competences, which resulted in two collaborations, one in a project for the eradication of Salmonella and another in a location based advertising project.

R5.12.2 Cases of success, problems met, internal and external conditioning factors

In 2007 USIC produced a positive budgetary margin, after two negative years, although below its expected target. This is a consequence of the national economic recovery, as well as of a significant diversification and repositioning effort, since the Unit is very exposed to external factors in its consulting and technology transfer activities. Lower fixed costs, due to staff reduction also contributed to this result.

In the scientific front the Unit lost its scientific coordinator, who embraced new professional challenges, not directly aligned with USIC's activities. Another collaborator abandoned USIC (a Physicist), since he decided not to pursue research activities in Information Technology. Therefore two PhDs were lost in 2007. As a consequence a move to focus research activities is under way and synergies with LIAAD and CRACS groups are being exploited, to complement internal competences.

R6. UNIT: UTM – TELECOMMUNICATIONS AND MULTIMEDIA

R6.1 SHORT DESCRIPTION OF THE UNIT

The Telecommunications and Multimedia Unit carries out research and development, consulting and technology transfer in scientific and technological areas that lay the foundation of the modern communications networks and audiovisual and multimedia services.

The Unit is organized in Areas. Each Area addresses a number of specific but related research topics, under a common strategy and goals that are mainly determined by the market sector it covers. Until recently this organization was based on three main Areas:

- Network Architectures and Services: IP Networks, Network Monitoring and Test Systems, QoS and Resource Management, Wireless and Mobile Communications.
- Multimedia Technologies and Systems: Audio Signal Analysis, Image and Video Processing, Digital Television, Multimedia Services.
- Optical and Electronics Technologies: Optical Communications and Microwaves, Microelectronics, Micro-optics Technologies.

By the end of 2007, reorganization took place, leading to the replacement of the Network Architectures and Services area with two Areas. The first (*Mobile and Wireless Networks*) deals mainly with the problems of wireless and mobile communications, which were already the main focus of the existing Area, and therefore keeps its structure. The second (*Internet Architectures and Networking*) has just been created under the leadership of two senior PhD researchers who have recently joined the Unit, in the scope of the Associated Laboratory contract; it is focused on novel Internet architectures and advanced networking paradigms and initially tackles three main topics: 1) novel Internet architectures; 2) community networking design; 3) disruptive communication models, and it is expected that it will grow during the next two years.

The R&D groups that constitute the Unit perform basic and applied research in the above areas and promote advanced training of his members. Coordination between these groups allows the exploitation of their specific competences in information, communications and signal processing technologies as well as the synergies necessary to design, develop and integrate complex systems that cover a broad range of application fields.

An important part of the activity of the Unit has been oriented towards the international market and was carried out under contract and in partnership with network operators and service providers, television broadcasters and manufacturers of communications systems and test equipment. The successful participation in past and current projects funded by European R&D programmes has a high strategic value, since it allowed scientific and technical co-operation with leading R&D institutions, continuous progress and updated knowledge and experience in state-of-the-art technologies and research topics, and liaison with standards bodies. The exploitation of results obtained in these projects by different means (research contracts, technology transfer, consulting, advanced training, incubation of spin-off companies, etc.) is now the main challenge of the Unit as a whole and of each one of its Areas.

R6.2 ACTIVITIES DEVELOPED IN 2007

R6.2.1 National programmes

The national research projects carried out in 2007 were funded by FCT under the PRAXIS XXI programme.

Four such projects (DOMIR, EBGCOM, IAMA and CFD) had started in previous years and completed by the end of 2007 or early 2008; the main goals and results achieved on each project will be described next. Seven new projects started by the end of 2007 (VOCAL, OMR, BCTT, DBPreserve, ROFWDM, DR-VidS and VECTOR); their main goals will also be outlined as well as some preliminary results, when applicable.

DOMIR (Dialogs and Ontologies for Multimedia Information Retrieval) had as main goals exploring the organization and analysis of multimedia documents, the construction of ontologies from textual documents and the use of dialogues in the user interaction.

Concerning the organization and analysis of multimedia documents, the existing database model has been refined to encompass the association of metadata to objects at different levels, to comply with audiovisual standards and to allow the use of heterogeneous descriptors in the computation of similarity measures for multimedia retrieval. Concerning the construction of ontologies from textual documents, automatic tools were developed allowing the identification of concepts and the extension of existent ontologies. These new concepts can also be related with audiovisual descriptors. Concerning the use of dialogues, the existing dialog system was adapted to the historic documentation domain. The project results have been demonstrated in three application domains for multimedia retrieval: a video-on-demand application, a historic documentation center and an experimental video retrieval environment.

EBGCOM (Electromagnetic band-gap antennas and components for broadband communications) has main objective of designing, developing and implementing novel RF/microwave components based on the EBG technology that find applications in wireless and optical communication systems. More specifically, the objectives of project are: 1) to develop methodologies for the design of EBG components: filters, delay lines and antennas; 2) to develop EBG devices for chromatic dispersion equalization in the electrical domain for coherent and SSB optical communication systems; c) to implement EBG antennas (single and phased arrays) for broadband wireless communications (wireless LANs and wireless MANs).

During 2007 the following main results were achieved:
- Evaluation of the state of the art in the design of patch antennas using EBG technology;
- Design, simulation, and assessment of patch antennas based on the EBG technology, with direct applications in broadband wireless communication services, namely wireless LANs;
- Implementation and characterization of dual-band EBG antennas for wireless LAN (2.4 and 5.2 GHz bands);
- A coplanar antenna has been designed and implemented;
- One EBG coplanar antenna that can operate properly at 2.40 to 2.49 GHz and 4.47 to 5.5 GHz, which can satisfy the needs of IEEE 802.11 a/b/g and HyperLAN, with a compact design, has been proposed. The proposed EBG antenna has more than 2 dB gain improvement as well as 10 and 5 dB reduction on the backward radiation in the 2 and 5 GHz bands, respectively;
- A low profile dual band EBG-PIFA antenna suitable for WLAN applications has also been designed and implemented. Reduction of backward radiation was achieved in combination with a compact design that makes this antenna suitable for portable mobile devices.

The main objective of IAMA (Implementation of a biologically realistic associative memory in analogue CMOS-VLSI) is the analogue implementation of a set of coupled oscillators for memory association. The fundamental blocks of the project had bee designed in 2006, while during 2007 the design and implementation of a multiplexed KII network in analogue VLSI was undertaken. All building blocks, such as current memories, filters and multiplexing scheme, were simulated and an integrated circuit was designed and sent for fabrication.

The main goal of CFD (Custom Computing Architectures for Computational Fluid Dynamics) is to develop a custom computing machine capable of accelerating a Computational Fluid Dynamics software application used to simulate the wind flow over complex terrain. The research being carried out was focused on a core function of the application that is responsible for the resolution of sparse systems of equations and accounts for the most part of the execution time during typical simulation runs. This function exhibits a regular structure of arithmetic computations and is thus adequate for experiment

with its migration to a custom computing engine. If successful, the results of this project will demonstrate the effectiveness of custom computing for numeric intensive scientific applications with floating-point arithmetic operations.

During 2007 a first version of a custom processor was developed and built, although it has not yet been integrated and evaluated with the original simulation software. This was implemented on a prototyping board equipped with Virtex4 FPGAs and supports only small problems than can fit the limited internal memories of the FPGA. A partitioning mechanism is being evaluated and implemented in order to enable the usage of the custom processor for realist problems attached to the wind flow simulation software.

VOCAL aims at studying acoustic, aerodynamic and electroglotographic data of voice production by patients suffering from unilateral vocal fold paralysis, in order to devise forms of treatment and rehabilitation that may complement speech therapy and surgery. The project started with an evaluation of the state-of-the-art in related fields and the organization of tests to be carried out with selected patients.

The main objectives of OMR (Optical Music Recognition) are: 1) development of Optical Music Recognition (OMR) technology that facilitates the conversion of handwritten music scores to digital format and its representation in hierarchical fashion using MusicXML; 2) development of a web-based system integrating OMR technology and providing seamless access to browsing, retrieval, search and analysis of the music scores stored in the system.

During 2007 the following results were achieved: 1) development of new algorithms for a robust detection and removal of staff lines in a music score, a fundamental operation for a successful recognition of a music score; 2) development of a prototype system integrating OMR technology, database storage and search, with a web-base interface.

The main objectives of BCCT (Breast Cancer Conservative Treatment) are: 1) development of a new learning methodology to predict the overall aesthetic result of breast cancer treatments; 2) development of an intelligent medical system for the aesthetic evaluation of breast cancer conservative treatment, integrating the new evaluation technology, database access and a friendly user interface.

The following results were already achieved: 1) development of new algorithms for the automatic detection of breast contours in digital photographs; 2) improvements on the learning technology for the prediction of the overall aesthetic result; 3) improvements on a prototype workstation integrating the new evaluation technology and database access.

DBPreserve (Data Warehouses for the Long-term Preservation of Institutional Electronic Records and Databases) aims at exploring the application of DW technology to the preservation of complex electronic records like databases. In more detail, the project will study:
- Properties that the DW must possess, according to the standards already established (like the Open Archives Initiative);
- Rules of transformation from operational systems into DW, adopting a process-centric but integrated view, which guarantees those properties;
- Metadata needs, beyond the data in the operational database, to preserve the meaning of the processes, most often just implicit in the data but present in organizational procedures and in software development documentation;
- Application to a case study of a concrete institution.

ROFWDM (Design and Optimisation of WDM Millimetre-Wave Fibre-Radio Systems) is being developed in partnership with Instituto de Telecomunicações (Aveiro and Porto) and Siemens SA. The main objectives of the project are to analyze, design and optimize FBGs for WDM millimetre-wave fibre-radio systems. Specific milestones include:
- Investigation of various "FBG enabled" WDM fibre-radio system architectures with emphasis on the coexistence of WDM fibre-radio systems with the existing telecommunications WDM optical network infrastructure;

- Analysis, design and optimisation of FBGs for fibre chromatic dispersion compensation and wavelength selection in WDM fibre-radio systems;
- Assessment of impact of Bragg grating induced crosstalk and dispersion on the performance of WDM fibre-radio system;
- Assessment of impact of the fibre-radio system infrastructure on realistic signaling schemes forming the basis of current wireless systems;
- Investigation of receivers that overcome the combined effect of FBG induced degradation and fibre impairments based on signal processing techniques;
- Implementation of a WDM millimetre-wave fibre-radio system demonstrator incorporating FBGs to perform wavelength selection and fibre chromatic dispersion compensation.

The work started with the evaluation of the state of the art in WDM enabled fibre-radio architectures based on FBG technology. Focus is being placed on interleaving techniques to improve spectral efficiency in WDM systems in combination with optical add-drop multiplexers in ring networks.

The general goal of the project Dr-VidS is to show the feasibility and effectiveness of approaches based on dynamically reconfigurable logic (DRL) for complex, multi-task applications with real-time constraints. Realistic constraints are ensured by application to video background/foreground segmentation problems. Conversely, research on video segmentation algorithms will be oriented to optimize the use of dedicated hardware. Concrete goals are to:
- Provide a management system for DRL-based applications with multi-task support;
- Design algorithms for online assembly of image processing pipelines;
- Use DRL-based modular pipelined data paths for depth map construction from stereo images;
- Develop and test an algorithm that uses colour, depth and motion information to segregate moving objects/persons from static and predictably moving objects;
- Implement the segmentation algorithm on DRL hardware;
- Devise a metric that can effectively compare video objects segmentation;
- Build and evaluate a demonstration system.

The main objective of the project VECTOR is to develop a set of software compilation and hardware synthesis tools to enable an automatic translation of MATLAB applications into high-performance custom designed vector processors. The team of INESC Porto is responsible for the hardware component of the work, and will create a set of tools to assist the automatic synthesis of floating-point data paths as well as all the other building blocks required for assembling custom vector processors.

R6.2.2 European programmes

Eight research projects funded by the European Commission under the IST programme (FP6) were active in 2007. A brief description of goals and results of each project follows.

DAIDALOS 2 (an IST FP6 Integrated Project) aims at validating the results of DAIDALOS (Designing Advanced network Interfaces for the Delivery and Administration of Location independent, Optimized personal Services) and designing and developing a Beyond 3G (B3G) communications framework. It addresses secure, personalized and pervasive services built on heterogeneous wireless network and service infrastructures for the mobile user. INESC Porto is working in 3 topics: a) support of user mobility between heterogeneous wireless networks using IEEE 802.21 techniques extended with QoS information; b) integration of ad-hoc with infrastructure networks; c) traffic monitoring and its usage in session admission control.

Ambient Networks Phase 2 (an IST FP6 Integrated Project) and its predecessor (Ambient Networks) aimed at developing innovative mobile network solutions capable of solving the problems of future networks characterized by a multitude of access technologies, network operators and business actors. The concept of dynamic composition of networks was proposed as the basis for the establishment of inter-network agreements. Phase 2 of the project, which was concluded in December 2007, aimed at proving feasibility of concepts through implementation, integration and performance evaluation. INESC

Porto participated in two work packages ("Connectivity and Dynamic Internetworking" and "Network Composition and Connectivity"). During 2007, research work focused on the development of algorithms (e.g., explicit congestion control algorithms for capacity varying media) and protocols that support the concept of network composition (e.g., communication between AN Functional Entities, A bootstrapping, event distribution, etc.) as well as on the development and integration of modules into prototypes and project demonstrators.

VISNET II is the continuation VISNET(Networked audiovisual media technologies), an IST FP6 Network of Excellence, that covers several disciplines of related networked audiovisual (AV) media technologies, namely coding and analysis of AV content, storage, retrieval and transport of AV information over heterogeneous networks, context-aware content adaptation and security and privacy aspects. During 2007 the following results were achieved: 1) conduction of research within the fields of music signal analysis, video object segmentation and recognition and context-awareness, which led to the submission of several scientific papers; 2) development of a tool to analyze music signals; 3) development of a software application to segment video signals; 4) design of a software system to take decisions concerning the need to adapt content, given the restrictions imposed by the context of usage; 4) design of an ontology model for context;: 5) development of a QoS architecture suitable for heterogeneous environments characterized by different network access technologies and deployment of a testbed.

MOSAICA (Semantically Enhanced, Multifaceted, and Collaborative Access to Cultural Heritage) is an IST PF6 project that aims the development of tools and technologies to allow the discovery and presentation of just about any digital cultural heritage object. At the same time it allows different groups of interest to develop and share innovative and creative user experiences under the form of virtual expeditions by integrating and combining multiple, distributed virtual cultural objects. Accordingly, MOSAICA is developing software tools to enable: 1) the creation and annotation of digital objects representing cultural heritage assets; 2) the creation of virtual expeditions using previously annotated digital objects; 3) the distribution, management and retrieval of those digital objects; 4) to semantically search and navigate through those digital objects. During 2007 the following results were achieved: 1) completion of the functional specification of the MOSAICA content management system based on the use of p2p technologies, distributed databases and Web Services and adopting a 2-layer, services oriented approach; 2) implementation of services for registering and uploading digital objects.

Enthrone 2 is the continuation of Enthrone (End-to-End QoS through Integrated Management of Content, Networks and Terminals) and proposes an integrated management solution that covers the entire audio-visual service distribution chain, including protected content handling, distribution across networks and reception at user terminals. To meet its objectives, the project is developing an efficient, distributed and open management architecture based on the use of MPEG-21 and Web Services technologies and adopting an end-to-end QoS approach. Such architecture will be able to support the provision of personalized and adaptable services to the end-user, honoring the contracted quality. During 2007 the following results were achieved: 1) specification of a new data model based on MPEG-21 DID for the generation and transaction of complex multimedia digital objects suitable for different types of audiovisual services; 2) development of an enhanced version of a tool to access and navigate through multimedia digital objects using different types of terminal devices (PC, PDA and mobile phones); 3) design and implementation of a sub-system to process user requests and coordinate the actions required to fulfill those requests;

EDCine (Enhanced Digital Cinema) aims at improving affordability, accessibility and quality of experience of digital cinema and live or interactive events in European theatres and through other devices down the chain after suitable transcoding. The major sub-goal is to develop solutions compatible with the emerging standards and to improve them wherever necessary to deal with Europe's requirements. In particular, EDCine will demonstrate the possible convergence between the SMPTE DCI model and the European needs, as well as networked audio-visual systems, while keeping as much as possible the security of content along the distribution chain. During 2007 the following results were achieved: 1) generic study of the metadata requirements across the complete D-cinema content value

chain; 2) identification of new D-cinema content formats, namely stereoscopic cinema and audio wave field synthesis. A possible approach to adopt for the encapsulation and carriage of the relevant metadata to these two formats has been identified.

TARGET (Top Amplifier Research Groups in a European Team) is a Network of Excellence that aimed at integrating different European research groups in the field of microwave amplifiers. The project concluded by the end of 2007 and the final year was devoted to advanced training of PhD students, with participation in the summer and winter schools organized by the project.

UROOF (Photonic components for Ultra-Wideband radio over optical fiber) has the goal of investigating building blocks for enabling the delivery of Ultra-wideband (UWB) radio signal over low-cost optical fiber. The aims are therefore to study, develop, test and implement very low cost conversion solutions for direct optical-to-UWB (O/UWB) and UWB-to-optical (UWB/O) based on innovative microwave photonic concepts. Unlike state of the art radio-over-fiber (RoF) technologies that are used in the backbone of the wireless access systems, UROOF will address the challenges of the low-cost wireless personal area networks (WPAN). Two UROOF applications will be investigated in the field trial: 1) range extension of WPAN over 1000m carrying real-world UWB signal with 480 Mbit/s data rates and, 2) very low-cost antenna distribution system (VL-DAS) for multi-cell WPAN applications.

During 2007 the task of INESC Porto within this project was to model the wireless and fiber channels and assess the impact of device nonlinear distortion on the "UWB over fiber" system performance. The following main results were achieved:
- A model of the Mach-Zehnder Modulator has been developed based on the 10th order series expansion of the electric field suitable for simulation in baseband;
- A model of the Electro-Absorption Modulator (EAM) has been developed based on the measured transfer function of the device;
- An analytical model of the laser nonlinear distortion was obtained based on the Volterra series;
- An optimum modulation depth for driving the Vertical Cavity Surface Emitting Laser (VCSEL) has been identified as a function of the required signal-to-noise ratio;
- The distortion of the VCSEL has been assessed in terms of the operation point including the Relative Intensity Noise (RIN) effect;
- The penalty introduced by the dispersion of the fiber was assessed in terms of the BER simulations;
- Optimum receiver operation has been derived and simulated for a faded and non-linearly distorted OFDM signal;
- The impact of the uplink noise was also simulated.

The project ACEOLE (Data Acquisition, Electronics, and Optoelectronics for LHC Experiments), submitted to the Marie Curie Initial Training Network (ITN) programme, was approved in 2007 and is expected to start in 2008. ACEOLE is a mono-site ITN, with CERN as main host institution, offering research training in the application of advanced microelectronics, optoelectronics, networking and real-time data processing technologies in the world's state-of-the-art particle detector systems at the Large Hadron Collider (LHC), and a future upgraded Super-LHC (SLHC).

INESC Porto will collaborate with CERN on an individual research training project to develop a low-phase noise low-bandwidth Phase-Locked Loop (PLL) to synthesize clocks with high spectral purity, survive high radiation levels and be immune to Single Event Upsets. The circuit will be fabricated in an advanced commercial-grade 130 nm CMOS technology, will use both full-custom and standard cell design techniques, and employ the radiation-tolerance-by-design methods developed at CERN for the LHC. Built-in self test features will be also included in order to detect degradation of the ASIC performance. INESC Porto will also be involved in the experimental characterization of semiconductor laser devices and in the optimization of their electrical matching to the laser driver ASIC.

R6.2.3 Other programmes, consulting, services

Two projects (Multicast and MicroMassMedia) under research contracts with PT Inovação (PTIN) started and completed during 2007. Besides their specific goals, a common goal of these projects was to give advanced training to young researchers who would join PTIN at the end of the projects.

The Multicast (management of multicast sessions) project addresses traditional IP multicast sessions and improves it by: 1) deploying multicast over heterogeneous access technologies, namely xDSL, WiMAX e UMTS; and 2) introducing admission control mechanisms for both senders and receivers. A new solution and prototype were developed and demonstrated.

The MicroMassMedia project aimed in the first phase to study LASeR (a rich media standard format dedicated to the mobile, embedded and consumer electronics industries) and then use it to develop a UMTS based access to a prototypical networked Personalized Video Recorder (nPVR), which had been developed during 2006 in another research contract with PTIN. A service oriented architecture was developed to implement a fully working scalable backend prototype. Furthermore, the project also allowed for the demonstration of the concept of MicroMassMedia, where users can share videos using the 3G capabilities of their mobiles, implicitly creating social networks based on the consumption of broadband services in mobile contexts, potentially the base for the ultimate 3G killer-application.

UPMEDIA 1 was the second phase of UPMEDIA, a project started in 2006 with the University of Porto to develop a Campus wide TV network that could help disseminating its events and contribute to a common sense of belonging among its students and staff. In this project, UTM was responsible for planning the entire infrastructure and further developing the player and management software. The system is based on a web centric approach and employs peer-to-peer protocols to take high quality video to a geographically disperse network of displays, causing the least impact on the existing data network.

Cooperation between INESC Porto and some Brazilian research institutions was settled in the framework of a GRICES/CNPq programme. The main goal of this project is to improve the scientific ability of the partners in the photonic area, more specifically on the theory and design of Raman amplifiers for optical communications. The project also aims at strengthening the collaboration between the Brazilian institutions and INESC Porto and the exchange of researchers and students. Researchers from Brazil have visited INESC Porto in June and two INESC Porto researchers have visited UFPA and IME in Brazil, in October. Meetings have taken place to define the future course of the research work. Components have been acquired and the development of a distributed Raman amplifier has started. Two Brasilian students have also conducted research work at INESC Porto during 2007 within the framework of this project.

Besides the R&D activities carried out under contract it is also worth mentioning other research activities linked with PhD and MSC work as well as final year projects by BSc students.

R6.3 SUMMARY OF RESULTS OF THE RESEARCH ACTIVITIES OF THE TEAM MEMBERS

- **Projects**

Summary of projects developed in 2007

Type of Activity (1)	No. Projects (2)			Total Income (€)
	N	E	I	
R - Research	11	8		570.250
D - Development	3			89.800
C - Consulting				
A – Advanced training				
T – Technology Transfer				
O - Other				
TOTAL	14	8		660.050

Summary of relative distribution of sources of income

Financing (3)	Status (4)			Total Income (€)
	S - Started	OG- On-going	C - Concluded	
NP – National Programmes	1.25%	0.22%	8.37%	64.970
EP – European Programmes	1.48%	66.15%	8.92%	505.280
CS – Consulting and services			13.61%	89.800
O – Other R&D sources				
OS – Other sources				
Total	2.73%	66.37%	30.90%	660.050

Summary of projects developed in 2007

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
Target	V. Tavares	R	E	EP	6PQ	01-2004	12-2007	F
IAMA	V. Tavares	R	N	NP	FCT	06-2004	01-2008	OG
DOMIR	C. Ribeiro	R	N	NP	FCT	03-2005	12-2007	F
CFD	J. C. Alves	R	N	NP	FCT	05-2005	11-2007	F
EBGCOM	H. Salgado	R	N	NP	FCT	09-2005	12-2007	F
DAIDALOS 2	M. Ricardo	R	E	EP	6PQ	01-2006	12-2008	OG
WWI AN 2	J. Ruela	R	E	EP	6PQ	01-2006	12-2007	F
MOSAICA	M.T. Andrade	R	E	EP	6PQ	06-2006	11-2008	OG
UROOF	H. Salgado	R	E	EP	6PQ	07-2006	12-2008	OG
VISNET II	J. Ruela	R	E	EP	6PQ	07-2006	12-2008	OG
ENTHRONE 2	M.T. Andrade	R	E	EP	6PQ	09-2006	08-2008	OG
UPMEDIA 1	S. Macedo	D	N	CS	-	01-2007	03-2007	F
MicroMassMedia	S. Macedo	D	N	CS	-	03-2007	12-2007	F
Multicast	M. Ricardo	D	N	CS	-	03-2007	12-2007	F
EDCINE	M.T. Andrade	R	E	EP	6PQ	07-2007	06-2009	S

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ. Type (3)	Financ. Prog.	Starting date	Conclusion (prediction)	Status (4)
VOCAL	A. Ferreira	R	N	NP	FCT	09-2007	09-2010	S
BCCT	J. Cardoso	R	N	NP	FCT	10-2007	09-2010	S
DBPreserve	G. David	R	N	NP	FCT	10-2007	09-2009	S
OMR	J. Cardoso	R	N	NP	FCT	10-2007	09-2010	S
ROFWDM	H. Salgado	R	N	NP	FCT	10-2007	09-2009	S
DR-VidS	J. C. Ferreira	R	N	NP	FCT	11-2007	05-2010	S
VECTOR	J. C. Alves	R	N	NP	FCT	11-2007	11-2010	S

(1) Type of Project: R - Research; D - Development; C - Consulting; A - Advanced Training; T - Technology Transfer; O - Other

(2) Degree of internationalization: N – National; E – European; I – International *(Select one)*

(3) Source of financing: NP – National Programmes; EP – European Programmes; CS – Consulting and services; O – Other R&D financing sources; OS – Other sources

(4) Status: S – Starting: activities initiated in 2007 and continuing in 2008; OG – On-going: activities started earlier than 2007 and continuing in 2008; F – Finished: activities ending in 2007.

- **Summary of publications**

Summary of publications in 2007

Type of publication	Number
Theses concluded in 2007 by members of the unit	3
Books (author)	1
Chapter/paper in books	2
Publications (editor)	
Papers in International Journals with scientific referees	13
Papers in National Journals with scientific referees	
Conference Proceedings in events with scientific referee and selection	40
Other publications (National meetings, local journals, etc.)	12
Total	71

(*) papers co-authored with researchers of other Units

- **Summary of post-graduation activities**

Summary of theses supervised by members of the unit in 2007

Type	Starting	On-going	Concluded	Total
Master	24	13	16	53
Doctoral	7	32	1	40
Total	31	45	17	93

- **Summary of Advanced Training Actions**

Summary of Advanced Training Actions organized for external trainees in 2007

Type	Number
Training for graduation students *(estágios curriculares)*	23
Training for others *(estágios extra-curriculares)*	2
Professional training actions *(estágios profissionais)*	2
Other actions	
Total	27

- **Summary of activities of cooperation or dissemination**

Summary of items

Type	Number
Organizing conferences or meetings	8
Colaboration in papers authored by INESC Porto researchers	98
External persons directly involved in actions organized by INESC Porto	

- **Human resources in 2007**

Summary of Unit personnel at the end of 2007

Type	Education				Total	Variation (*)
	PhD.	MSc.	BSc.	Other		
R&D						
University or Polytechnic Staff	29	6			35	+2
INESC Porto Grant Holders		4	7		11	+4
Other Grant Holders		7	17		24	+4
Employees	3		1		4	+2
Trainees						
Other						
Administrative				1	1	0
Total	32	17	25	1	75	+12

(*)   Relative to 2006, in absolute numbers.

R6.4 LIST OF PUBLICATIONS

R6.4.1 Theses concluded in 2007 by members of the unit

SANTOS, ANTÓNIO PEDRO FORTUNA, "Robust Header Compression in 4G Networks", Faculdade de Engenharia da Universidade do Porto, July 2007, MSc thesis.

PINHO, CARLOS NUNO DE OLIVEIRA, "Redes de Sensores Wireless Aplicadas em Jogos Inteligentes em Ambiente Real" (Application of wireless sensor networks to intelligent games), Faculdade de Engenharia da Universidade do Porto, June 2007, MSc thesis.

CIOBANU, GIORGIANA, "MPEG-21 DI Browser, an MPEG-21 based Architecture for the Consumption of Digital Items", Faculdade de Engenharia da Universidade do Porto, January 2007, MSc thesis.

R6.4.2 Books (Author)

BERNARDINI, N., SERRA, X., LEMAN, M., WIDMER, G., GOUYON, F., *et al*, "Roadmap for Sound and Music Computing" 2007, www.soundandmusiccomputing.org.

R6.4.3 Chapter/paper in Books

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OLIVEIRA, J.M., CARRAPATOSO, E., "Using Context Information for Tailoring Multimedia Services to User's Resources", Lecture Notes on Computer Science, October 2007, vol.4787, p.138-148.

R6.4.4 Publications (Editor)

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OLIVEIRA, J.M., CARRAPATOSO, E., "A Constraint-Based Approach to Dynamically Adapt Multimedia Interfaces", Journal of Mobile Multimedia, June 2007, vol.3, no.2, p.179-196.

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R6.4.7 Conference Proceedings with scientific referees

AZEVEDO, I., CARRAPATOSO, E., CARVALHO, C., "Pragmatic Characterization of Learning Objects", *CELDA 2007 - Cognition and Exploratory Learning In Digital Age*, December 2007, Almansor, Algarve, Portugal.

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OLIVEIRA, J.M., CARRAPATOSO, E., "Using Telecommunications Middleware to Dynamically Adapt Multimedia Services", *IWSSIP 2007 - 14th International Conference on Systems, Signals and Image Processing*, June 2007, Maribor, Slovenia.

LAGRANGE, M., MARTINS, L.G., TZANETAKIS, G., "Semi-Automatic Mono to Stereo Up-mixing using Sound Source Formation", *Proceedings of 122nd AES Convention*, May 2007, Vienna, Austria.

SIDDIQI, J., RAHMAN, F., AKHGAR, B., SHAH, N., KORDA, N., ATTIAS, R., BENAMOU, N., ANDRADE, M.T., DORI, J., HASHAVIA, B., "Collaborative Access through Semantically Enhanced Distributed & Diversified Cultural Content", *CTS 2007 - The 2007 International Symposium on Collaborative Technologies and Systems*, May 2007, Orlando, USA.

GONÇALVES, B., CALISTRU, C.M., RIBEIRO, C., DAVID, G., "An Evaluation Framework for Multidimensional Multimedia Descriptor Indexing", *ICDE 2007 - 2007 IEEE 23rd International Conference on Data Engineering*, April 2007, Istanbul, Turkey.

GOUYON, F., DIXON, S., WIDMER, G., "Evaluating low-level features for beat classification and tracking", *ICASSP 2007 - 2007 International Conference on Acoustics*, April 2007, Honolulu, Hawaii, USA.

SIDDIQI, J., AKHGHAR, B., SHAH, N., RAHMAN, F., KORDA, N., ATTIAS, R., ANDRADE, M.T., DORI, J., HASHAVIA, B., BENAMOU, N., "A System for Semantically Enhanced, Multifaceted, Collaborative Access: Requirements and Architecture", *ITNG 2008 - 5th International Conference on Information Technology: New Generations*, April 2007, Las Vegas, USA.

CARVALHO, P.M., ANDRADE, M.T., ALBERTI, C., CASTRO, H., CALISTRU, C.M., DE CUETOS, P., "A unified data model and system support for the context-aware access to multimedia content", *WMSRM 07 - Workshop Multimedia Semantics - The Role of Metadata* , March 2007, Aachen, Germany.

DAVID, G., "Data Warehouses in the Path from Databases to Archives", *PresDB'07 - First International Workshop on Database Preservation*, March 2007, Edinburgh, Scotland.

TEIXEIRA, L.F., CORTE-REAL, L., "Cascaded change detection for foreground segmentation", *Proceedings of IEEE Workshop on Motion and Video Computing WMVC 2007 - IEEE Workshop on Motion and Video Computing 2007*, February 2007, Austin, TX, USA.

SANTOS CARDOSO, J., CARDOSO, J.C., CORTE REAL, L., "Object-Based Spatial Segmentation of Video Guided by Depth and Motion Information", *Proceedings of IEEE Workshop on Motion and Video Computing WMVC 2007 - IEEE Workshop on Motion and Video Computing 2007*, 2007, Austin, TX, USA.

LAGRANGE, M., MARTINS, L.G., TEIXEIRA, L.F., TZANETAKIS, G., "Speaker Segmentation of Interviews Using Integrated Video and Audio Change Detections", *CBMI 2007 - Fifth International Workshop on Content-Based Multimedia Indexing* 2007, Bordeaux, France.

R6.4.8 Other Publications

AZEVEDO, I., CARRAPATOSO, E., VAZ DE CARVALHO, C., "Caracterização semântica e pragmática de objectos educativos em repositórios" [Caracterização semântica e pragmática de objectos educativos em repositórios], *SIIE 2007 - IX Simpósio Internacional de Informática Educativa*, November 2007, Porto, Portugal.

FARIA, B., DE SOUSA, A.A., REIS, L.P., "A didactic application for creating new sights from multiple images using Light Fields", *VIPIMAGE 2007 - Conferência Internacional "VIPIMAGE - ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing"*, October 2007, Porto, Portugal.

GONÇALVES, V., CARRAPATOSO, E., "Geração automática de metadados: um contributo para a recuperação de objectos de aprendizagem", *IADIS 2007 - Conferência Ibero-Americana WWW Internet 2007*, October 2007, Vila Real, Portugal.

MARTINS, J., SILVA, J., DE SOUSA, A.A., "Sistema de Realidade Aumentada Baseado em Padrões Rectangulares de Dimensões Desconhecidas", *15 EPCG - 15º Encontro Português de Computação Gráfica*, October 2007, Porto Salvo, Portugal.

REBELO, C.A., COELHO, A., CRUZ, F., DE SOUSA, A.A., NUNES FERREIRA, F., "Prototipagem rápida de ferramentas de autoria e visualização para Computação Gráfica", *15 EPCG - 15º Encontro Português de Computação Gráfica*, October 2007, Porto Salvo, Portugal.

SOUSA, J., FONSECA, B., CARRAPATOSO, E., "Uma Arquitectura para a Composição Dinâmica de Serviços Dependentes do Contexto", *IADIS 2007 - Conferência Ibero-Americana WWW Internet 2007*, October 2007, Vila Real, Portugal.

CIOBANU, G., CARVALHO, P.M., ANDRADE, M.T., CARRAPATOSO, E., "An MPEG-21 Web Peer for the consumption of Digital Items", *CISTI 2007 - 2ª Conferência Ibérica de Sistemas e Tecnologias de Informação*, June 2007, Porto, Portugal.

OLIVEIRA, J., RODRIGUES, M., SALGADO, H., "Non-Linear Distortion Compensation of OFDM Signals in Radio-over-Fiber Systems"*, SEON 2007 - V Symposium On Enabling Optical Networks and Sensors*, June 2007, Aveiro, Portugal.

PEREIRA, M.R., SALGADO, H., PEREIRA, J., "Analysis of Microstrip Electromagnetic Bandgap Structures Using the Couple-Mode Theory"*, SEON 2007 - V Symposium On Enabling Optical Networks and Sensors*, June 2007, Aveiro, Portugal.

PESSOA, L.M., SALGADO, H., DARWAZEH, I., "Adaptive Electrical Equalization of Optical Impairments in Coherent Optical Systems "*, SEON 2007 - V Symposium On Enabling Optical Networks and Sensors*, June 2007, Aveiro, Portugal.

BANDEIRA, A., DE SOUSA, A.A., OLIVEIRA, C., LOPES, E., TORRÃO, S., "Improving collaboration and communication: a Videoconference room in FEUP as a mean to share teaching and learning resources among universities"*, VideoFunet Conference 07 - 1st VideoFunet Conference*, May 2007, Tampere, Finland.

GASPAR, B., PINHO, C., CAMPOS, R., MORLA, R., "A New Approach for Slideshow Presentation at Working Meetings"*, Conftele 2007 - 6th Conference on Telecommunications*, May 2007, Peniche, Portugal.

R6.5 LIST OF JOURNALS

Journal	Number of papers
Artificial Intelligence in Medicine	1
IET Computers & Digital Techniques	1
International Journal of Network Management	1
Journal of Analogue Integrated Circuits and Signal Processing	1
Journal of Computer Graphics Forum	1
Journal of Machine Learning Research	1
Journal of Mobile Multimedia	1
Journal of Multimedia	1
Journal of New Music Research	1
Physical Review D	1
Telecommunication Systems	1
The Breast	1
The Breast Journal	1
TOTAL	13

R6.6 LIST OF PATENTS

Blank.

R6.7 LIST OF PROTOTYPES

SoundCut II: a command line tool for the separation of audio sources
Developed under internal project
Demo Place: INESC Porto
Development Period: January 2007 – December 2007

Tool for Object segmentation using background modeling and cascaded change detection
Developed under internal project
Demo Place: INESC Porto
Development Period: January 2007 – December 2007

Web-based System for the Recognition of Music Scores
Developed under internal project
Demo Place: INESC Porto
Development Period: February2007 – August 2007

Workstation for the evaluation of the aesthetic result of the Breast Cancer Treatments
Developed under BCCT
Demo Place: INESC Porto
Development Period: January – December 2007

Enhanced version of the Context-aware multimedia services platform
Developed under ENTHRONE 2
Demo Place: INESC Porto and PTC Luxembourg (ENTHRONE 2 partner)
Development Period: September 2006 – December 2007

Enhanced version of the MPEG21 Digital Items Browser for portable devices
Developed under ENTHRONE 2
Demo Place: INESC Porto
Development Period: September 2006 – December 2007

MPEG21 multimedia repository and search engine
Developed under ENTHRONE-2
Demo Place: INESC Porto
Development Period: September 2006 – December 2007

Preliminary version of a p2p content management system
Developed under MOSAICA
Demo Place: INESC Porto
Development Period: December 2006 – December 2007

Preliminary version of a two-layer Context-aware Ontology
Developed under VISNET II
Demo Place: INESC Porto
Development Period: September 2007 – December 2007

UMTS access to network personalized video recorders
Developed under MicroMassMedia
Demo Place: INESC Porto and PT Inovação
Development Period: March 2007 – December 2007

Experimetal retrieval system (video retrieval workbench developed for TRECVID 2007)
Developed under DOMIR
Demo Place: INESC Porto
Development Period: September 2006 – December 2007

Natural language classifier
Developed under DOMIR
Demo Place: INESC Porto
Development Period: March 2007 – December 2007

Secure macro mobility solution based on HIP and IPSec
Developed under Ambient Networks (Phase 2)
Demo Place: FEUP
Development Period: January – December 2007

QoS extensions to IEEE 802.21
Developed under Daidalos II
Demo Place: INESC Porto
Development Period: January – December 2007

NSIS (Next Steps in Signaling)
Developed under VISNET II and internal project
Demo Place: INESC Porto
Development Period: January – December 2007

Ad-hoc protocols in NS-3
Developed under internal project
Demo Place: INESC Porto
Development Period: January – December 2007

Auto-configurable Personal Area Networks over heterogeneous technologies
Developed under internal project
Demo Place: INESC Porto
Development Period: January – December 2007

Secure multicast for heterogeneous wireless access networks
Developed under contract with PTIN
Demo Place: INESC Porto and PTIN
Development Period: January – December 2007

MATLAB code for simulating the propagation of OFDM signals over SM and MM optical fiber with a general optical source (MZ modulator, EAM or VCSEL) including the antenna and receiver noise

Developed under UROOF

Demo Place: INESC Porto

Development Period: January - December 2007

Coplanar antenna using an EBG artificial magnetic conductor ground plane

Developed under EBGCOM

Demo Place: INESC Porto

Development Period: January 2007 – July 2007

Dual band PIFA antenna using EBG technology for WLAN applications

Developed under UROOF

Demo Place: INESC Porto

Development Period: July - December 2007

EBG structure with controlled delay

Developed under EBGCOM

Demo Place: INESC Porto

Development Period: July – December 2007

Proof-of-concept prototype board to demonstrate the functionality of an adaptive scheme for estimating RF amplifiers' nonlinearities and correcting eye diagram's opening

Developed under internal project

Demo place: INESC Porto

Development period: June 2007 – December 2007

Title: Multiplexed KII network

Developed under IAMA

Demo Place: INESC Porto

Development Period: January 2007 – August 2007

R6.8 LIST OF THESES SUPERVISED BY MEMBERS OF THE UNIT DURING 2007

PhD Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Vítor Gonçalves	FEUP	E. Carrapatoso	INESC Porto/FEUP	Semantic Web in the educational context	2007
Alexandre Carvalho	FEUP	A. A. Sousa	INESC Porto/FEUP	Visualization of Spatiotemporal Database Systems	2008
Catalin Calistru	FEUP	Gabriel David M. Cristina Ribeiro	INESC Porto/FEUP	Data organization and search in multimedia databases	2008
Filipe Lameiro Abrantes	FEUP	Manuel Ricardo	INESC Porto/FEUP	Congestion control in 4G heterogeneous networks	2008
Luís Gustavo Martins	FEUP	Aníbal Ferreira	INESC Porto/FEUP	Analysis and recognition of audio oriented to music applications	2008
Luís Miguel Teixeira	FEUP	Artur P. Alves Luís Corte-Real	INESC Porto/FEUP	Joint Source Video Coding	2008

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Miguel Magalhães Silva	FEUP	João C. Ferreira José Carlos Alves	INESC Porto/FEUP	Management of dynamically reconfigurable resources in CPU/FPGA systems	2008
Paula Viana	FEUP	Artur P. Alves	INESC Porto/FEUP	Digital Television Archives	2008
Pedro Miguel do Vale Moreira	FEUP	A. A. Sousa	INESC Porto/FEUP	Management and Visualization of Very Complex 3D Models and Scenes	2008
Rui Campos	FEUP	Manuel Ricardo	INESC Porto/FEUP	Creation and composition of Ambient Networks	2008
Teresa Andrade	FEUP	Artur P. Alves	INESC Porto/FEUP	Architectural Support for Ubiquitous Access to Multimedia Content	2008
António C. Martins	FEUP	E. Carrapatoso	INESC Porto/FEUP	Adaptive Hypermedia Systems	2009
Jaime Sousa Dias	FEUP	Manuel Ricardo	INESC Porto/FEUP	Security in Mobile IP Networks with Multicast Traffic	2009
João Manuel Barbosa de Oliveira	FEUP	H. Salgado	INESC Porto/FEUP	Design and Optimisation of DWDM Millimetre-Wave Fibre Radio Systems	2009
João Paulo Sousa	UTAD	E. Carrapatoso	INESC Porto/FEUP	Dynamic Composition of Services	2009
Luís Filipe Teixeira	FEUP	Luís Corte-Real Aníbal Ferreira	INESC Porto/FEUP	Automatic description of video based on multimodal analysis	2009
Pedro Manuel Marques	FEUP	Sílvio Abrantes	INESC Porto/FEUP	MIMO Transmission Techniques in 4G Systems	2009
Pedro Mota	FEUP	J. Machado Silva	INESC Porto/FEUP	In-circuit testing of adaptive RF front-end circuits	2009
Tânia Calçada	FEUP	Manuel Ricardo	INESC Porto/FEUP	Integration of ad-hoc with infrastructured networks	2009
António Abel Castro	FEUP	E. Carrapatoso Carlos V. Carvalho	INESC Porto/FEUP ISEP/IPP	Use of multimedia learning objects with a semantic context for the Health area	2010
António Alberto Santos Pinto	FEUP	Manuel Ricardo	INESC Porto/FEUP	Definition of an Application-layer Architecture for The Support of Secure and Adaptive Multicast Services	2010
António Pedro Fortuna Santos	FEUP	Manuel Ricardo	INESC Porto/FEUP	Wireless Metropolitan Vehicular Networks	2010
Daniel Oancea	FEUP	João C. Lopes Rui Moreira	INESC Porto/FEUP INESC Porto/UFP	Adaptive multimedia components in distributed environments	2010
Gustavo Carneiro	FEUP	Manuel Ricardo	INESC Porto/FEUP	QoS abstraction in 4G heterogeneous networks	2010
Hélder Castro	FEUP	Artur P. Alves	INESC Porto/FEUP	Peer-to-peer strategies for secure TV content distribution	2010
Hermes Irineu Del Monego	FEUP	José Oliveira Manuel Ricardo	INESC Porto/FEP INESC Porto/FEUP	Modeling Practices for Creating and Assessing the Viability and the Sustainability of New Business Models Appeared in the Context of Disruptive Technologies	2010
Isabel S. Azevedo	FEUP	E. Carrapatoso Carlos V. Carvalho	INESC Porto/FEUP ISEP/IPP	Semantic contextualization of educational objects	2010
José Fernando Martins	FEUP	A. A. Sousa	INESC Porto/FEUP	3D Modeling in Augmented Reality Environments	2010
Lucian Ciobanu	FEUP	Luís Corte-Real	INESC Porto/FEUP	Distributed video coding for systems with multiple cameras	2010
Luis Manuel de Sousa Pessoa	FEUP	H. Salgado	INESC Porto/FEUP	Compensation of Fibre Impairments in Coherent Optical Systems	2010
Mário Rui Silveira Pereira	FEUP	H. Salgado	INESC Porto/FEUP	Electromagnetic Bandgap Antennas and Components for Broadband Communications	2010
Paulo Alexandre Duarte Ferreira	FEUP	José Carlos Alves João C. Ferreira	INESC Porto/FEUP	Computational systems based on hetrogeneous parallel architectures	2010

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Pedro Miguel Carvalho	FEUP	Luís Corte-Real	INESC Porto/FEUP	Analysis and representation of video based on 3D models	2010
Ricardo Sousa	FEUP	Aníbal Ferreira	INESC Porto/FEUP	Audio signal processing applied to speech rehabilitation	2010
Hernâni Gonçalves	FCUP	José A. Gonçalves Luís Corte-Real	FCUP INESC Porto/FEUP	Multi-spectral satellite images identification	2011
João Paulo Rodrigues	FEUP	Artur P. Alves	INESC Porto/FEUP	Peer-to-peer networks for corporate TV environments	2011
José A. Oliveira	FEUP	José Ruela	INESC Porto/FEUP	Information model for autonomous network management	2011
Nuno Fonseca	FEUP	Aníbal Ferreira Ana Paula Rocha	INESC Porto/FEUP FEUP	Transcription from natural singing to synthetic singing	2011
Nuno Pedro Rodrigues	U. Minho	José Mendes Luís Corte-Real	U. Minho INESC Porto/FEUP	Real time control and surveillance system	2011
Paulo Jorge Coelho	FEUP	Manuel Ricardo	INESC Porto/FEUP	Management of multicast groups in mobile networks	2011
1	2	3	4	5	6

1 – Name of the post-graduation student
2 – Institution where the thesis is submitted; if the host institution for the student is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester
3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

MSc Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Alberto Lírio	FEUP	E. Carrapatoso	INESC Porto/FEUP	Associative relationship system – model and implementation	2007
André Ribeiro e Cunha	FEUP	Mário Alves Manuel Ricardo	ISEP/IPP INESC Porto/FEUP	On The Use Of IEEE 802.15.4/ZigBee as Federating Communication Protocols for Wireless Sensor Networks	2007
António Pedro Fortuna Santos	FEUP	Manuel Ricardo	INESC Porto/FEUP	Robust Header Compression in 4G Networks	2007
Carlos Pinho	FEUP	J. Ruela J. M. Mendonça	INESC Porto/FEUP	Application of wireless sensor networks to intelligent games	2007
Eugénia Leite	FEUP	Carlos V. Carvalho E. Carrapatoso	ISEP/IPP INESC Porto/FEUP	Interrelation professor/student in IP@BD Digital Base	2007
Gil Coutinho	FEUP	José Ruela	INESC Porto/FEUP	Virtual private LAN services in metropolitan area networks	2007
Giorgiana Ciobanu	FEUP	E. Carrapatoso	INESC Porto/FEUP	MPEG-21 DI Browser, an MPEG-21 based Architecture for the Consumption of Digital Items	2007
Joana Gomes Rocha	FEUP	A. A. Sousa	INESC Porto/FEUP	Segmentation of Virtual Urban Environments for location-based Mobile Services	2007
Joel Pedro Carvalho	FEUP	Henrique Salgado	INESC Porto/FEUP	Optical Switching Techniques: Device Development and Implementation in Fibre Optic Technology	2007

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Nuno G. Antunes	FEUP	E. Carrapatoso	INESC Porto/FEUP	Autonomous system for presentation, retrieval and processing of questionnaires in real time	2007
Olinda Figueiredo	FEUP	E. Carrapatoso	INESC Porto/FEUP	Multimedia content in a ludicrous and educational environment	2007
Rosa G. Barroso	FEUP	E. Carrapatoso	INESC Porto/FEUP	Decision assisted system for a choice process in large populations	2007
Sérgio Martins	FEUP	José Carlos Alves	INESC Porto/FEUP	Automatic generation of RTL code for real-time image acquisition and processing systems	2007
Suzana Leitão	FEUP	Teresa Restivo E. Carrapatoso	FEUP INESC Porto/FEUP	Design and implementation of a remote laboratory	2007
Vera Moitinho de Almeida	FEUP	A. A. Sousa	INESC Porto/FEUP	Application of Information and Communication Technologies to a Museum Space	2007
Vítor Alves	FEUP	E. Carrapatoso	INESC Porto/FEUP	Teaching course in Visual and Technological Education for children with special educational needs	2007
Alberto R. Barroso	FEUP	João C. Ferreira	INESC Porto/FEUP	Techniques of auto-test (BIST) and auto-repair (BISR) for synchronous RMA memories	2008
Ana Raquel Faria	FEUP	Manuel Ricardo	INESC Porto/FEUP	Robust header compression in IEEE 802 networks	2008
André C. Mendes	FEUP	Artur P. Alves	INESC Porto/FEUP	IPTV Project	2008
António Fonseca	FEUP	E. Carrapatoso	INESC Porto/FEUP	Usability in digital multimedia libraries	2008
Brígida Faria	FEUP	A. A. Sousa	INESC Porto/FEUP	Light Field - Image Based Rendering	2008
Bruno Filipe Oliveira	FEUP	José Ruela	INESC Porto/FEUP	Integrated system of QoS mechanisms in IP networks	2008
Carlos Guilherme Araújo	FEUP	José Ruela	INESC Porto/FEUP	Implementation of a module for authentication and management of user profiles	2008
Daniel Marcos Sousa	FEUP	José Ruela	INESC Porto/FEUP	Virtual One-hop Ad-hoc Networks	2008
Daniel Ramos	FEUP	J. Ruela	INESC Porto/FEUP	Quality of Service in MPLS / DiffServ networks	2008
Filipe Miguel Sousa	FEUP	Manuel Ricardo	INESC Porto/FEUP	Monitoring of multicast traffic in heterogeneous networks	2008
Filipe Tiago Magalhães	FEUP	Henrique Salgado	INESC Porto/FEUP	Development of sensor systems for the detection of gases based on micro structured optical fibers	2008
João Diogo Araújo	FEUP	Manuel Ricardo	INESC Porto/FEUP	Algorithms for explicit congestion control in shared access media	2008
João Nuno Pereira	FEUP	João C. Ferreira	INESC Porto/FEUP	Application of network coding to link routing in VLSI circuits	2008
João Pedro Maia	FEUP	Manuel Ricardo	INESC Porto/FEUP	Dynamic auto-configuration of next generation personal networks	2008
José Alberto Marques	FEUP	Henrique Salgado	INESC Porto/FEUP	Optical fiber devices for telecommunications based on the integration of micro-optic components	2008
José Manuel Lopes	FEUP	Aníbal Ferreira	INESC Porto/FEUP	Robust analysis environment of the main voice qualitative parameters	2008
Luís Filipe Reis	FEUP	E. Carrapatoso	INESC Porto/FEUP	Cost optimization in next generation IMS networks using open source products	2008
Luís Miguel Leite	FEUP	Aníbal Ferreira	INESC Porto/FEUP	Audio driven cartoon production	2008
Luís Miguel Marques	FEUP	Henrique Salgado	INESC Porto/FEUP	Optimization of production processes of Bragg sensors in optical fibers	2008
Mara P. Carvalho	FEUP	Aníbal Ferreira	INESC Porto/FEUP	Interactive game for training of Portuguese vowels	2008

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
M. Dominguez Silva	FEUP	A. F. Coelho / A. A. Sousa	INESC Porto/FEUP	Specification, test and validation in expeditious modeling of virtual urban environments	2008
M. Raquel Patrício	FEUP	E. Carrapatoso	INESC Porto/FEUP	Evaluation of the usability of a child's portal – a new interactive multimedia application	2008
Miguel Gata	FEUP	E. Carrapatoso	INESC Porto/FEUP	Virtual Reality	2008
Nuno André Lima	FEUP	Henrique Salgado	INESC Porto/FEUP	EBG (Electromagnetic Band Gap) structures in microstrip circuits	2008
Nuno Dantas Faria	FEUP	M. T. Andrade	INESC Porto/FEUP	Testing methodologies for DRM-enabled content mediation platforms	2008
Nuno Gonçalo Salta	FEUP	Manuel Ricardo	INESC Porto/FEUP	Security extensions to the TCP/IP stack for the support of congestion	2008
Pedro César Oliveira	FEUP	Jaime Cardoso	INESC Porto/FEUP	eCassiopeia – network virtual laboratory	2008
Pedro Miguel Alves	FEUP	João C. Ferreira	INESC Porto/FEUP	Flexible programmable cores for SOC applications	2008
Pedro Miguel Oliveira	FEUP	Manuel Ricardo	INESC Porto/FEUP	Service integration in multi-use communications platforms	2008
Pedro Vieira	FEUP	Luís Corte-Real	INESC Porto/FEUP	Scaleable video and interoperability in multimedia networks	2008
Ricardo Jorge Duarte	FEUP	J. Ruela	INESC Porto/FEUP	End-to-end Quality of Service for heterogeneous, wireless access networks	2008
Rui J. Gonçalves	FEUP	F. L. Pereira / A. A. Sousa	FEUP / INESC Porto/FEUP	Video projection in virtual environments	2008
Sérgio Pinto Lopes	FEUP	Manuel Ricardo	INESC Porto/FEUP	Automatic and dynamic connection to the Internet of next generation personal networks	2008
Valter Mónica	FEUP	José Ruela	INESC Porto/FEUP	Implementation and validation of a model for certification and distribution of keys for authentication of TLS sessions based on DNSSEC	2008
Vítor Hugo Barbosa	FEUP	M. T. Andrade	INESC Porto/FEUP	Ontologies in multimedia applications sensitive to the utilization context	2008
Vítor Joel Silva	FEUP	A. A. Sousa	INESC Porto/FEUP	Automatic reconstruction of fragmented 2D objects	2008
Vitor Manuel Silva	FEUP	José Ruela	INESC Porto/FEUP	Integrated system for maintenance and recovery of GNU/Linux servers	2008
1	2	3	4	5	6

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3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

R6.9 ORGANISATION OF INTERNATIONAL SCIENTIFIC EVENTS

IMSTW'07 - International Mixed Signals Testing Workshop

Póvoa de Varzim, Portugal

June 18-20, 2007

José Machado da Silva - General Chair

3rd IEEE International GHz/Gbps Test Workshop (GTW 07)

Póvoa de Varzim, Portugal
June 18-20, 2007
José Machado da Silva – Local Chair

CISTI 2007 - 2nd Iberian Conference on Information Systems and Technologies
Porto, Portugal
June 21-23, 2007, Porto
Eurico Carrapatoso – member of Scientific Committee

DTIS'07 – International Conference on Design & Technology of Integrated Systems in Nanoscale Era
Rabat, Morocco
September 2-5, 2007
José Machado da Silva – Program Co-Chair

MOSAICA (FP6 project) - General Meeting
Porto, Portugal
October 22-23, 2007
Maria Teresa Andrade – organisation

DCIS 2007 - XXII Conference on Design of Circuits and Integrated Systems
Sevilla, Spain
November 21-23, 2007
José Silva Matos – member of Steering Committee

IS'07 – 2nd International Symposium on Information Security
Vilamoura, Portugal
November 26-27, 2007
José Ruela – member of Program Committee

CoNEXT 2007 - 3rd Annual CoNEXT Conference
Columbia University, New York, USA
December 10-13, 2007
Rute Sofia, Paulo Mendes – members of Technical Program Committee

R6.10 ADVANCED TRAINING

The research projects that were carried out under contract with PT Inovação (PTIN) had, besides their specific goals, a common goal of giving advanced training to young researchers who would join PTIN at the end of the projects. During 2007 such advanced training of two researchers was carried out in the framework of two projects previously described: Multicast and MicroMassMedia.

R6.11 OTHER CONTRIBUTIONS TO THE OBJECTIVES OF ASSOCIATE LABORATORY

UNIT: UTM - TELECCOMUNICATIONS AND MULTIMEDIA	Thematic Line
Consolidation of research work in "wireless and mobile communications" and in "advanced services for universal access to multimedia content"; these activities	Support technologies for

were mainly carried out in the framework of research projects funded by FP6 (in the thematic areas *Mobile and wireless systems beyond 3G* and *Networked audiovisual systems and home platforms*) and national programmes, were supported by on-going and newly started PhD and MSC theses in related topics, and gave rise to a large number of scientific papers, prototypes and demonstrators.	networked audiovisual applications
Strengthening the research work in "Fiber Supported Microwave/Radio Systems" supported by a Photonics and Microwave laboratory setup during 2005 and 2006.	
Continuation of research activities in audiovisual processing, namely audio semantic analysis, image and video segmentation techniques and multimodal analysis.	
Execution of R&D contracts (with PT Inovação), covering consultancy, development, technology transfer and advanced training activities.	
Launch of a new research area (Internet Architectures and Networking) focused on novel Internet architectures and advanced networking paradigms, such as community networking design and disruptive communication models, led by two senior PhD researchers that joined the Unit, in the scope of the Associated Laboratory contract.	

R6.12 ANALYSIS AND ASSESSMENT OF DEVIATIONS RELATIVE TO FORMER PLANNING

R6.12.1 Comparison with strategic actions or policy lines defined in the plan of the previous year

The activity of the Unit in 2007 was carried out according to the plan, without significant deviations in what concerns running projects and expected scientific results. The number of papers both in international journals and conference proceedings with scientific refereeing largely exceeded the values that had been planned for 2007 as well as the results attained in 2006. The number of theses concluded in 2007 was below the expectations, especially in what concerns PhD theses; however it is expected to recover from this deviation, since a number of theses that should have concluded in 2007 have either been submitted still in 2007 or will be submitted early in 2008.

European projects continued to play an important role in reaching a high level of scientific excellence and gaining expertise in advanced and emerging technologies as well as in establishing strategic partnerships. They provide a very rich environment for training young researchers, in particular in association with MSc and PhD programmes, and allow creating critical mass of the research teams.

Unlike the expectations, the projects submitted to the first call of the *7th Framework Programme* (FP7) launched by the EC, with participation of INESC Porto, did not succeed. However the Unit joined an ongoing FP6 project (EDCine) and a new project (ACEOLE) submitted to the Marie Curie Initial Training Network (ITN) programme was approved and will start in 2008.

The research in *Fiber Supported Microwave/Radio Systems*, which was made possible with the setup of a Photonics and Microwave laboratory with funding from FCT under *Programa Nacional de Re-equipamento Científico*, is already producing scientific results and attracting new PhD students.

Two new R&D contracts submitted to the *Plano de Inovação do Grupo PT 2007-2009* were signed with Inovação (PTIN). They aimed at consultancy, development, technology transfer and advanced training and completed with success at the end of 2007.

Eight projects submitted to the call launched by FCT (*Fundação para a Ciência e a Tecnologia*) in 2006 were approved; seven projects started during the third quarter of 2007 and one starts during the first quarter of 2008. Most of these projects are lead by senior researchers of the Unit, in some cases in partnership with other academic and research institutions and industrial companies.

A new research area (*Internet Architectures and Networking*) focused on novel Internet architectures and advanced networking paradigms was launched. It is led by two senior PhD researchers that joined the Unit, in the scope of the Associated Laboratory contract.

Researchers of the Unit continued active in promoting the National Thematic Network in the area of Mobile Communications (RTCM), contributing with technical presentations in workshops organized by the network.

Regular open meetings, organized at the Unit or Area level, continued to take place and were mainly used to present results of on-going research projects, MSc and PhD theses, or results being published in journals or conferences, as well as to discuss scientific issues that cross different areas and thus require the active participation of different research groups.

Finally, the incubation of one spin-off company (XAREVISION) completed during 2007 and the incubation of another company (NEXT2YOU) is still undergoing.

R6.12.2 Cases of success, problems met, internal and external conditioning factors

The cases of success were already pointed out in the previous section. At a global level the scientific results were rather positive, as proven by various performance indices.

The INESC Porto teams that participated in FP6/IST projects made important contributions at various levels – specification, development, integration and test of prototype systems and demonstrators, technical reports, deliverables and scientific papers.

The participation and results achieved in National and European research projects constitute the major cases of success, to which it is possible to add the partnership with PTIN in R&D contracts and the strengthening of research activities in optical communications and microwaves.

The main problems met by the Unit lie in the difficulties of establishing stable partnerships and R&D contracts with the industry and operators, either for consulting, development or technology transfer. The fact that the projects submitted to the first call of FP7 were not approved may aggravate this situation, which is mainly due to external factors rather than to the lack of expertise or know-how within the Unit. It is expected, however, that some of these problems will be overtaken with the opportunities created by new partnerships being established in the framework of QREN (*Quadro de Referência Estratégico Nacional*).

R7. UNIT: UITT – INNOVATION AND TECHNOLOGY TRANSFER

R7.1 SHORT DESCRIPTION OF THE UNIT

R&D Institutions that intend to take advantage of the economic opportunities of their R&D programmes should leverage their innovation potential through appropriate strategies and management processes which might allow them to manage and promote their R&D results outside the organization, in order to create economic value.

The purpose of the Unit is to consolidate last years' investments and experience of INESC Porto in the development of internal processes and tools to manage their R&D results, and organize this knowledge and competences in a transversal Unit that can take responsibility and leadership of the process of knowledge valorization.

In this context, the main goal of the UITT is to develop and promote innovation management practices, acting directly in the internal processes, supporting entrepreneurship activities helping business development as well as incubation.

The Unit also plays a role in the creation and increase of knowledge in the scientific area of Innovation Management, Technology Transfer and Entrepreneurship. Thus, advanced training - MSc and PhD level training –constitutes a major objective aiming at creating internal excellence in the relevant research areas and to provide the industry with highly qualified professionals, capable of dealing with the challenges of entrepreneurial innovation.

The Unit main Research and Development areas and activities are:

- The Innovation Management:

  o Act directly in the internal innovation process and practices, by developing, in collaboration with other R&D Units, processes and tools that enable an efficient management of R&D projects results in order to maximize the valorization opportunities.

  o Provide consulting services to companies, concerning the implementation of R&D+I management systems according to NP 4457:2007. These services follow a proprietary methodology, developed in the context of COTEC Portugal project.

  o Provide training to companies in order to increase awareness and knowledge concerning the NP R&D+I management systems and methodologies.

  o Development research projects in order to increase emergent knowledge that supports internal and external activities.

- Entrepreneurship:

  o Promote an entrepreneurship culture behind academic researchers

  o Create entrepreneurial awareness through the organization of training actions, development of tools, and giving direct support to promoters in the process of turning ideias into business.

  o Supply of incubation services through the recently created incubator LET-IN.

R7.2 ACTIVITIES DEVELOPED IN 2007

R7.2.1 National programmes

FORMINOV: Integrated Training for Innovation Management and R&D valorization (participants: IBMC, IPATIMUP, INEGI, INEB, TEC Minho, PIEP).

R7.2.2 European programmes

LEADERSHIP: "Leading European RTD Sustained High Value Innovative Production for MANUFUTURE" [partners: CNR-ITIA (IT); FhG-VP (GER);LBORO (UK); CETIM (Fr); CECIMO (BL); CAMT (PL); FATRONIK (SP);VDMA (GER); AGORIA (BL)].

R7.2.3 Other programmes, consulting, services

Other programs:

- UTEN - University Technology Enterprise Network: metrics for innovation with University Texas Austin (US)

- OPEN INNOVATION, Do firms actually do "Open Innovation"? Survey Results from Five Countries and Some New Ideas (China, Finland, Portugal, Spain, and Russia), with Carl Joachim Kock (Instituto de Empresa, Maria de Molina, Spain), Marko T. Torkkeli (Lappeenranta University of Technology, Finland), Pekka A. S. Salmi (Lappeenranta University of Technology, Finland), Juha Väätänen (Lappeenranta University of Technology, Finland), Maria Smirnova (St. Petersburg State Universit, Russia), Sergei Kouchtch (St. Petersburg State Universit, Russia)

- DIGITAL MEDIA - University Texas Austin (US), UNL, UP

Consulting/Services:

- Framework for identifying and classifying R&D activities - COTEC

- R&D+I Management System - CIFIAL

- Incubation services, including mentoring business development, IP and licensing consulting, development of partnerships, funding negotiations, access to technological infrastructures, and local incubation. The main achievements are:
  - Six proposals for valorization were evaluated.
  - Five out of six moved to a pre-incubation stage.
  - Three companies created:
    - **XAREVISION** (Corporate TV e Digital Signage Networks): exploitation of results which were first developed at INESC Porto.
    - **TOMORROW OPTIONS** (Diabetic Foot Diagnosis Devices): proposed by an external promoter.
  - From this effort, three other companies were already launched in 2008:
    - **NEXT TO YOU** (Corporate Network Solutions): exploitation of results which were initially developed at INESC Porto.
    - **SMARTWATT** (ESCO): exploitation of knowledge developed at INESC Porto.
    - **AUDIOLICI** (High Quality Audio Systems): proposed by an external promoter.
  - INESC Porto is shareholder in four of these five companies (XAREVISION, TOMORROW OPTIONS, SMARTWATT and AUDIOLICI).

R7.3 SUMMARY OF RESULTS OF THE RESEARCH ACTIVITIES OF THE TEAM MEMBERS

- **Projects**

Summary of projects developed in 2007

Type of Activity (1)	No. Projects (2)			Total Income (€)
	N	E	I	
R - Research	1		2	
D - Development		1		42.000
C - Consulting	1			
A – Advanced training	1			61.957
T – Technology Transfer				
O - Other	2			6.300
TOTAL	5	1	2	110.257

Summary of relative distribution of sources of income

Financing (3)	Status (4)			Total Income (€)
	S - Started	OG- On-going	C - Concluded	
NP – National Programmes		56,19%		61.957
EP – European Programmes			38,09%	42.000
CS – Consulting and Services	5,71%			6.300
O – Other R&D sources				
OS – Other Sources				
Total	5,71%	56,19%	38,09%	110.257

Summary of projects developed in 2007

Name of the project	Respons.	Type Proj. (1)	Degree of Intern. (2)	Financ.		Starting date	Conclusion (prediction)	Status (4)
				Type (3)	Prog.			
LEADERSHIP	J.C. Caldeira	D	E	EP	6 PQ	02-2006	10-2007	F
FORMINOV	Alex. Xavier	A	N	NP	ON Norte	10-2006	04-2008	OG
Tomorrow Options	Alex. Xavier	O	N	CS	-	03-2007	12-2008	S
XAREVISION	Alex. Xavier	O	N	CS	-	04-2007	03-2008	S
CIFIAL R&D+I	Alex. Xavier	C	N	CS	-	06-2007	01-2008	S
CALÇADO	R. Madureira	R	N	OS	-	11-2007	03-2008	S
I&D UTEN	A. Teixeira	R	I	CS	-	11-2007	06-2008	S
OPEN	A. Teixeira	R	I	EP	-	11-2007	12-2008	S

(1) Type of Project: R – Research; D – Development; C – Consulting; A – Advanced Training; T – Technology Transfer; O - Other

(2) Degree of internationalization: N – National; E – European; I – International *(Select one)*

(3) Source of financing: NP – National Programmes; EP – European Programmes; CS – Consulting and services; O – Other R&D financing sources; OS – Other sources

(4) Status: S – Starting: activities initiated in 2007 and continuing in 2008; OG – On-going: activities started earlier than 2007 and continuing in 2008; F – Finished: activities ending in 2007.

- **Summary of publications**

Summary of publications in 2007

Type of publication	Number
Theses concluded in 2007 by members of the unit	
Books (author)	1
Chapter/paper in books	1
Publications (editor)	
Papers in International Journals with scientific referees	2
Papers in National Journals with scientific referees	1
Conference Proceedings in events with scientific referee and selection	11
Other publications (National meetings, local journals, etc.)	5
Total	21

(*)   papers co-authored with researchers of other Units

- **Summary of post-graduation activities**

Summary of theses supervised by members of the unit in 2007

Type	Starting	On-going	Concluded	Total
Master	5	8	5	18
Doctoral	2	1	0	3
Total	7	9	5	21

- **Summary of advanced training actions**

Summary of advanced training actions organized for external trainees in 2007

Type	Number
Training for graduation students *(estágios curriculares)*	2
Training for others *(estágios extra-curriculares)*	
Professional training actions *(estágios profissionais)*	
Other actions	1
Total	3

- **Summary of activities of cooperation or dissemination**

Summary of items

Type	Number
Organizing conferences or meetings	3
Collaboration in papers authored by INESC Porto researchers	
External persons directly involved in actions organized by INESC Porto	

- **Human resources in 2007**

Summary of Unit personnel at the end of 2007

Type	Education				Total	Variation (*)
	PhD.	MSc.	BSc.	Other		
R&D						
University or Polytechnic Staff	2				2	0
INESC Porto Grant Holders			3		3	0
Other Grant Holders						
Employees	1		1		2	0
Trainees						
Other						
Administrative						
Total	3		4		7	0

(*) Relative to 2006, in absolute numbers.

R7.4 LIST OF PUBLICATIONS

R7.4.1 Theses concluded in 2007 by members of the unit

Blank.

R7.4.2 Books (Author)

TEIXEIRA, A.A.C. and TAVARES-LEHMANN, A.T. Investimento Directo Estrangeiro, Capital Humano e Inovação: Uma Aplicação ao Caso Português, Vida Económica, Outubro, 2007.

R7.4.3 Chapter/paper in Books

COSTA, J. and TEIXEIRA, A.A.C., 2007, "Do universities influence innovative efforts and location choices of technology based firms? The case of Portugal", in Annette Bongardt & Celeste Amorim Varum (eds), Trends and Scenarios Towards Competitiveness, Chap. 4, INA.

R7.4.4 Publications (Editor)

Blank.

R7.4.5 International Journals with scientific referees

TEIXEIRA, A.A.C. "How Has the Portuguese Innovation Capability Evolved? Estimating a Time Series of the Stock of Technological Knowledge, 1960-2001", Portuguese Journal of Social Science, Vol. 6, Nº 2, 2007.

TEIXEIRA, A.A.C. "Incentivos excessivos à inovação na presença de consumidores sofisticados. Um modelo de progresso tecnológico endógeno com capital humano", Estudos Economicos, Vol. 37(3), Julho-Agosto-Setembro 2007, pp. 1-49, 2007.

R7.4.6 National Journals with scientific referees

TEIXEIRA, A.A.C. "Does inertia pay off? Empirical assessment of an evolutionary-ecological model of human capital decisions at firm level", Cadernos Sociedade e Trabalho, N.º 9 - Quadros de Pessoal e Investigação em Economia, DGEEP, Ministério do Trabalho e da Solidariedade Social, 2007.

R7.4.7 Conference Proceedings with scientific referees

MADUREIRA, R., "Critical Realism and Case Studies in International Business", *33rd EIBA - 33rd European International Business Review* 2007, December 2007, Catania, Italy.

Almeida, A.; TEIXEIRA, A.A.C., "Does patenting negatively impact on R&D investment? An international panel data assessment", 19th European Association for Evolutionary Political Economy (EAEPE) 2007 Conference, Porto, 2-3 November 2007.

Silva, S.; TEIXEIRA, A.A.C., "Institutional decisions and economic growth: uncovering the main gaps of the existing literature" 19th European Association for Evolutionary Political Economy (EAEPE) 2007 Conference, Porto, 2-3 November 2007.

TEIXEIRA, A.A.C.; Fortuna, N. "Human capital, trade and long-run productivity. Testing the technological absorption hypothesis for the Portuguese economy, 1960-2001", 1st Annual Meeting of the Portuguese Economic Journal, 22-24 June 2007.

TEIXEIRA, A.A.C., "Are engineering students more entrepreneurial than Economics and Business students? Results from a large survey ", XVIII ISPIM Conference, Varsaw, Poland, 17-20 June 2007.

Dieguez, T.; TEIXEIRA, A.A.C., "TIC e Capital Humano no Sector da Saúde em Portugal: o caso dos Médicos de Clínica Geral e Familiar", 24ª Encontro Nacional de Clínica Geral, Vilamoura, 21-24 Março 2007.

Cruz, S.; TEIXEIRA, A.A.C., "The emergence and fall of cultural clusters: the case of the film industry", 1st International Seminar on "Regional Innovation Policies", 22-24 February, FEP, Porto.

FIRMINO Oliveira Silva, FERREIRA, João José Pinto: "AN APPROACH TO MODELLING INFORMAL COMMUNICATION IN BUSINESS NETWORKS", IADIS International Conference, APPLIED COMPUTING 2007, Salamanca, Spain, 18-20 February 2007.

MADUREIRA, R., "The "Doctoral Paradox" of Information Societies", *RIP'07 - 1st International Seminar on Regional Innovation Policies*, February 2007, Porto, Portugal.

Santos, C.; Almeida, A.; TEIXEIRA, A.A.C., "Searching for clusters in tourism. A quantitative methodological proposal", 1st International Seminar on "Regional Innovation Policies", 22-24 February, FEP, Porto.

Silva, S.; TEIXEIRA, A.A.C., "On the divergence of evolutionary research area paths in the past fifty years: a comprehensive bibliometric account", Invited speaker, Max Planck Institute, Germany, 2007.

R7.4.8 Other Publications

ALMEIDA, A. and TEIXEIRA, A.A.C., "Does Patenting negatively impact on R&D investment? An international panel data assessment", FEP Working Papers nº 255, December 2007.

CRUZ, S.C and TEIXEIRA, A.A.C., "A new look into the evolution of clusters literature. A bibliometric exercise", FEP Working Papers nº 257, December 2007.

TEIXEIRA, A.A.C., "Entrepreneurial potential in Business and Engineering courses ... why worry now?", FEP Working Papers nº 256, December 2007.

TEIXEIRA, A.A.C. "Inovação e relações Universidade-Empresa no caso português", Ensaios, Boletim Mensal de Actividade Económica, Ministério da Economia e Inovação, Gabinete de Estratégia e Estudos, Junho 2007.

SILVA, S.T., VALENTE, J. and TEIXEIRA, A.A.C., "An evolutionary model of industry dynamics and firms' institutional behavior with job search, bargaining and matching", FEP Working Papers nº 241, April 2007.

R7.5 LIST OF JOURNALS

Journal	Number of papers
Portuguese Journal of Social Science	1
Estudos Economicos	1
TOTAL	2

R7.6 LIST OF PATENTS

Blank.

R7.7 LIST OF PROTOTYPES

Blank.

R7.8 LIST OF THESES SUPERVISED BY MEMBERS OF THE UNIT DURING 2007

PhD Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Ester Maria dos Reis Gomes da Silva	FEP- UP	Aurora Teixeira Mário Rui Silva	INESC Porto/FEP FEP	Structural Change and Economic Growth. The role of technological paradigms	2008
Ana Lopes	FEC- UC	Aurora Teixeira	INESC Porto/FEP	The scope of the social – Corporate Social Responsibility and Social Accounting Practices in Portugal	2010
Sandrina Moreira	DEGI- UA	Aurora Teixeira Celeste Amorim	INESC Porto/FEP UA	FDI – Economic Growth – Human Development Nexus: Uncovering the Hidden Reality of PALOP	2010
1	2	3	4	5	6

1 – Name of the post-graduation student
2 – Institution where the thesis is submitted; if the host institution for the student is other than INESC Porto, write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester
3 – Name of supervisor or supervisors
4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid
5 – Title of the thesis
6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

MSc Dissertations

Author	Instit.	Supervisor	Instit.	Title or topic	Conc. Date
Alexandre Almeida	FEUP	Aurora Teixeira	INESC Porto/FEP	The Negativity of Patents on R&D investment. A Panel Data Analysis	2007
André Rosário	FEUP	Aurora Teixeira	INESC Porto/FEP	Propensão ao Empreendedorismo dos finalistas da Universidade do Porto	2007
Carla Simão	FEUP	Aurora Teixeira	INESC Porto/FEP	Inovação e Design em Indústrias Tradicionais. O Caso do Sector do Mobiliário de Paredes e Paços de Ferreira	2007
Diogo P. R. Talone	FEUP	Aurora Teixeira	INESC Porto/FEP	Regulamentação, Inovação e Empreendedorismo: Impacto da regulamentação na emergência de iniciativas (intra)empreendedoras no Sector das Águas em Portugal	2007
Teresa Dieguez	FEUP	Aurora Teixeira	INESC Porto/FEP	ICT and Human Capital Obsolescence: the case of Portuguese Family Physicians	2007
Alexandra Lobo Xavier	EGP-UP	Aurora Teixeira	INESC Porto/FEP	Innovative management practices for promoting an academic entrepreneurship culture behind R&D institutions	2008
António Jorge Santos	FEUP	Aurora Teixeira	INESC Porto/FEP	Virtual entrepreneurship and emerging innovative technological concepts: Portugal, creative industries as Web 2.0	2008
Carlos Cordeiro	FEP-UP	Aurora Teixeira	INESC Porto/FEP	Spin-outs universitários. Que impacte ao nível da internacionalização da economia	2008
Cristiana Pedrosa	FEUP	Aurora Teixeira	INESC Porto/FEP	Assessing the range of influence of technology transfer research institutions. The case of INESC Porto	2008
Cristina Santos	FEP-UP	Aurora Teixeira	INESC Porto/FEP	Identificando Clusters. Uma Proposta Metodológica com Aplicação Empírica ao Sector do Turismo	2008
Fernando Manuel Monteiro Gomes	FEUP	João José Pinto Ferreira	INESC Porto e FEUP	"Oportunidades de Inovação na Aplicação de Redes de Comunicação Móvel a Sistemas de Automação de Redes de Distribuição de Energia"	2008
José Silva	FEUP	Aurora Teixeira	INESC Porto/FEP	O Estado-da-Arte da Literatura em Gestão da Inovação e Tecnologia. Um Estudo Bibliométrico	2008
Mafalda Vaz Pinto Moreira	FEUP	João José Pinto Ferreira Katja Tschimmel	INESC Porto/FEUP ESAD	"Gestão do Processo Criativo na Inovação ao Nível dos Serviços de Consultadoria em Sistemas de Informação e Comunicação"	2008
Margarida Maria da Silva Rodrigues Fachada	FEUP	João José Pinto Ferreira	INESC Porto/FEUP	"Integração de um Modelo de Comunidade Virtual "Peer-to-Peer" em Conteúdos Tutorias Multimédia, usando Ferramentas de Authoring, para e-Learning"	2008
Maria do Céu Moreira Lobarinhas	FEUP	João José Pinto Ferreira	INESC Porto/FEUP	"Empreendedorismo, o MIETE no Contexto de uma Aprendizagem ao Longo da Vida"	2008
Sara Cruz	FEP-UP	Aurora Teixeira	INESC Porto/FEP	Surveying Clusters: A comprehensive bibliometric account	2008
Teresa Martins	FEUP	Aurora Teixeira	INESC Porto/FEP	Cooperação empresarial em ID+I. O papel das Instituições de Apoio ao ID+I em Portugal	2008
José Sequeira	FEP-UP	Aurora Teixeira	INESC Porto/FEP	Mapping the scientific network of INESC Porto. An international overview	2009
1	*2*	*3*	*4*	*5*	*6*

1 – Name of the post-graduation student
2 – Institution holding the course where this student in enrolled in; if the host institution is other than INESC Porto,
   write the name in brackets. Ex. FEUP, for a student enrolled in a course at FEUP and having INESC Porto as host

institution; FCUP (Univ. Manchester), for a student enrolled in a course at FCUP and staying at the University of Manchester

3 – Name of supervisor or supervisors

4 – Affiliation institutions of supervisors – ex: INESC Porto/FEUP, FCTUC, P. Univ. Comillas Madrid

5 – Title of the thesis

6 – Predicted year of conclusion and delivery – will be taken in account in summary tables

R7.9 ORGANISATION OF INTERNATIONAL SCIENTIFIC EVENTS

Aurora TEIXEIRA, Chair of the **19th European Association for Evolutionary Political Economy** (EAEPE) 2007 Conference - 19th international conference, "Economic Growth, Development and Institutions - lessons for policy and the need for an evolutionary framework of analysis",1st - 3rd November 2007, www.fep.up.pt/conferencias/eaepe2007.

Aurora TEIXEIRA, Organizing Committee of the **1st International Seminar on "Regional Innovation Policies"**, organized by CEDRES, Faculty of Economics, University of Porto and co-organized by Napier University and Salzburg University, 22nd - 24th February, www.fep.up.pt/conferencias/regional2007.

Aurora TEIXEIRA, Co-Chair of the **14th International Product Development Management Conference**, Jointly organized by FEUP and FEP, University of Porto, 10th - 12th June.

R7.10 ADVANCED TRAINING

Supervision of three PhD thesis (ongoing) and 13 (6 ongoing and 7 concluded) Master thesis.

R7.11 OTHER CONTRIBUTIONS TO THE OBJECTIVES OF ASSOCIATE LABORATORY

Blank.

R7.12 ANALYSIS AND ASSESSMENT OF DEVIATIONS RELATIVE TO FORMER PLANNING

R7.12.1 Comparison with strategic actions or policy lines defined in the plan of the previous year

Blank.

R7.12.2 Cases of success, problems met, internal and external conditioning factors

There were four papers, two **accepted in 2006,** and the other two **accepted in 2007**, that were only published in 2008. These were considered in earlier reports as published output in 2007. In this plan we removed these itens.

TEIXEIRA, A.A.C., SANTOS, P. and DELGADO, A.P., "International regional patterns of R&D networks involving low tech SMEs", *International Journal of Technology Management* [Indexed in ISI].

TEIXEIRA, A.A.C., SANTOS, P. and BROCHADO, A., "International R&D cooperation between low-tech SMEs: the role of cultural and geographical proximity" *European Planning Studies* [Indexed in ISI].

SILVA, Sandra and TEIXEIRA, A.A.C., "On the divergence of evolutionary research paths in the past fifty years: a comprehensive bibliometric account", *Journal of Evolutionary Economics* [Indexed in ISI].

SILVA, Ester and TEIXEIRA, A.A.C., "Surveying structural change: seminal contributions and a bibliometric account", (com Ester Silva), *Structural Change and Economic Dynamics* [Indexed in EconLit].