FROM KNOWLEDGE GENERATION TO SCIENCE-BASED INNOVATION

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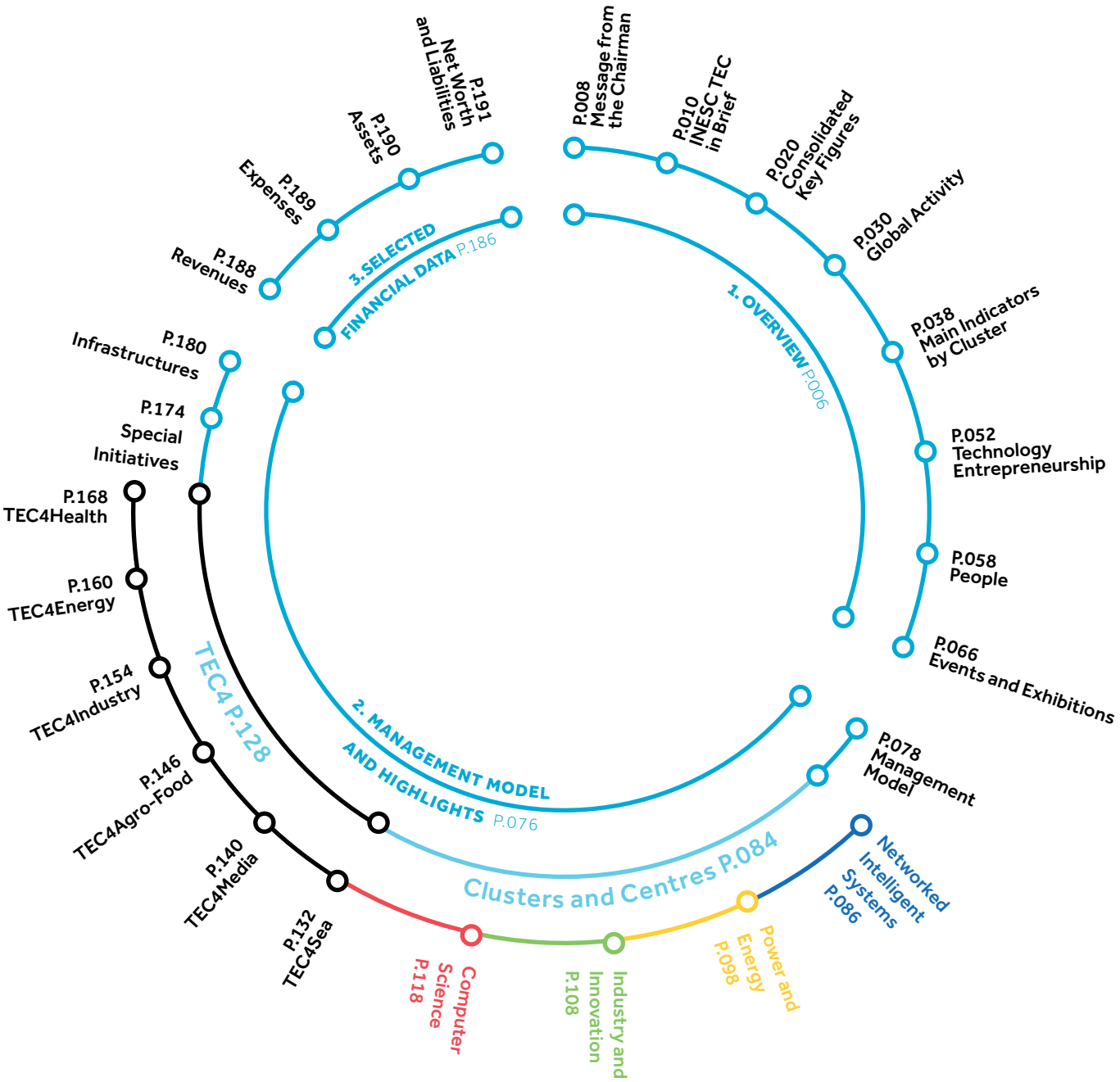
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EDIFICIO
FEUP - INESC TEC
INFRAESTRUTURA TECNOLÓG
TECHNOLOGICAL INFRA

1

OVERVIEW

1. OVERVIEW

MESSAGE FROM THE CHAIRMAN

CHAIRMAN'S ADDRESS

The year of 2018 was both venturous and successful for INESC TEC, the institution having been able to grow, consolidate and take decisive steps into the transformations required in the near future.

Leadership has been renewed, with new talent in the Board of Directors and the Executive Board, while ensuring a smooth transition in critical on-going dossiers and reinforcing management capability.

The individual and collective achievements in science and in technology transfer are remarkable and should make us all proud of the work done. Key facts and numbers speak for themselves and I will be just highlighting the most relevant and meaningful.

The 6% increase in activity to 17 M€, adding to a long sequence of consecutive years of growth, is evidence of INESC TEC's ambition, sustainability and resilience. A balanced operation led to positive financial results in line with previous years. The increase in contract research and consulting with international companies was 43%, as a result of the enhanced international standing of the institute in Europe and emerging activity in Brazil, Morocco, the US and Asia.

The leadership in patenting in Portugal in 2018 – 12 patents submitted to the EPO and 6 granted in Europe, Japan, Korea and US – is the outcome of a sound IP policy and of the quality and impact of the research. The number of indexed publications per core researcher with PhD registered a slight increase and the percentage of papers published in first quartile (Q1) journals grew significantly from 58% in 2017 to 71% in 2018.

Systematically pointed out as a benchmark in technology transfer in Portugal, INESC TEC has also pursued efforts in pre-incubation of 3 and launching of 2 new spin-off companies.

This pursuit of excellence was the collective effort of 745 integrated researchers, more than 100 holding work contracts, and 339 of which with a Ph.D. degree. The institution's unique managed science model is supported by a highly specialized staff of around 100.

Governance and internal organisation have been significantly improved in three major aspects: the deployment of the Conflict of Interests Management Policy, the enhanced automation and IT support of internal workflows, and the special attention paid to science communication.

Significant progress has been made in the relationship with associates and academic institutions, with protocols developed with FEUP and FCUP that lend themselves to be extended to P.Porto as well as to UMinho and UTAD.

Finally, reference should be made to an area of increasing acknowledgment of INESC TEC: the contribution to Public Policy in Science and Innovation. Following the hosting of the management teams of UTEN and the CMU Portugal Program, INESC TEC received the coordination of the UT Austin Portugal Program in 2018, and continued to host the coordination of the national initiative InCode.2030. Active since the beginning in the launching of the new Collaborative Laboratories (CoLABs), INESC TEC took the leadership of CoLAB ForestWISE and participated in CoLABs Vines &Wines and B2E (Blue Economy).

To close this brief note, I would like to extend a very special and warm thank you to my Board colleagues, to all the researchers, members of staff, and the institution's associates.

José Manuel Mendonça
Chairman

1. OVERVIEW

INESC TEC IN BRIEF

À INOVAÇÃO
DE BASE
CIENTÍFICA
U.PORTO
P.PORTO
inesc
utad
COMPETE 2020
2020
FCT
INESC TEC

INESC TEC is a private, non-profit association dedicated to scientific research and technological development, technology transfer, advanced consulting and training, and pre-incubation of new technology-based companies.

Vision

INESC TEC's vision is to be a relevant international player in Science and Technology in the domains of Computer Science, Industry and Innovation, Networked Intelligent Systems, and Power and Energy.

Mission

The dual mission of INESC TEC is to excel in research, seeking social relevance and international influence, and to foster pervasive intelligence, contributing to the competitiveness and internationalisation of Portuguese companies and institutions.

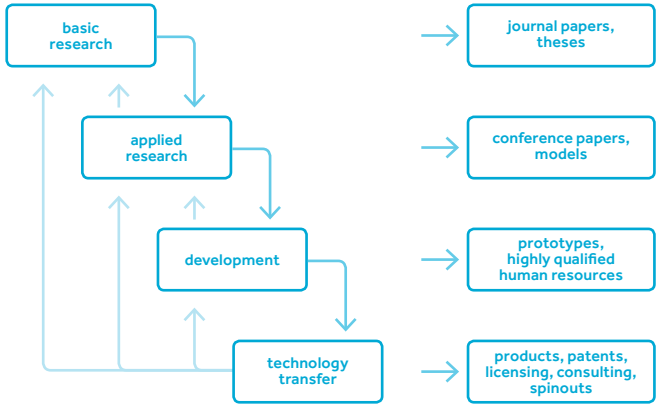


FIGURE 1
Knowledge production and valorisation chain

SYNERGISTIC RELATIONSHIP WITH THE ACADEMY

Associate Institutions

U.PORTO

P.PORTO

inesc

Since February 2019

Universidade do Minho

utad UNIVERSIDADE DE TRÁS-OS-MONTES E ALTO DOURO

Nuclei

ipb INSTITUTO POLITÉCNICO DE BRAGANÇA

UNIVERSIDADE ABERTA www.uab.pt

A RELEVANT ROLE IN THE ECOSYSTEM

6

SITES

In the cities of Porto, Braga and Vila Real.
Headquarters at Porto

745

INTEGRATED RESEARCHERS

+250

ONGOING R&D PROJECTS

12

PATENT APPLICATIONS

16

LABORATORIES

17M€

ACTIVITY

3.2M€

CONTRACT RESEARCH & CONSULTING

14

ACTIVE SPIN OFFS

CORE R&D DOMAINS

13 R&D Centres Structured in
4 Thematic Clusters

NETWORKED INTELLIGENT SYSTEMS

Applied Photonics
Biomedical Engineering Research
Robotics and Autonomous Systems
Telecommunications and Multimedia

POWER AND ENERGY

Power and Energy Systems

INDUSTRY AND INNOVATION

Enterprise Systems Engineering
Industrial Enginnering Management
Innovation, Technology and Entrepreneurship
Robotics in Industry and Intelligent Systems

COMPUTER SCIENCE

Advanced Computing Systems
Artificial Intelligence and Decision Support
High-Assurance Software
Information Systems and Computer Graphics

MAIN MARKET APPLICATION AREAS

Six TEC4 initiatives to articulate the interaction with the key market domains and address their innovation challenges.

TEC4 SEA

Bringing the digital world to a sustainable sea economy.

TEC4 MEDIA

Digital media technologies to improve the content value chain and user experience.

TEC4 AGRO-FOOD

Co-shaping the digital evolution in agro-food and forestry.

TEC4 INDUSTRY

Foster transformation for an innovative, collaborative, human-centred and sustainable industry.

TEC4 ENERGY

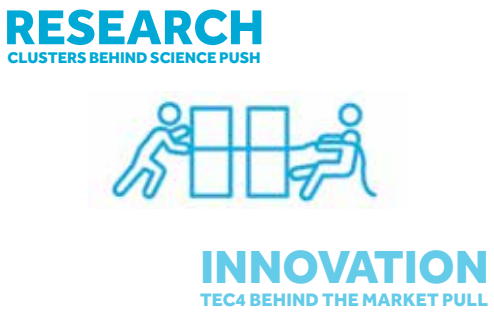
Decarbonization and digitalization of the energy sector.

TEC4 HEALTH

User-centred ICTs to improve health care and personal wellbeing.

MATCHING SCIENCE AND REAL-WORLD CHALLENGES

Connected research and innovation structures achieve the right balance between science and technology push and market pull.



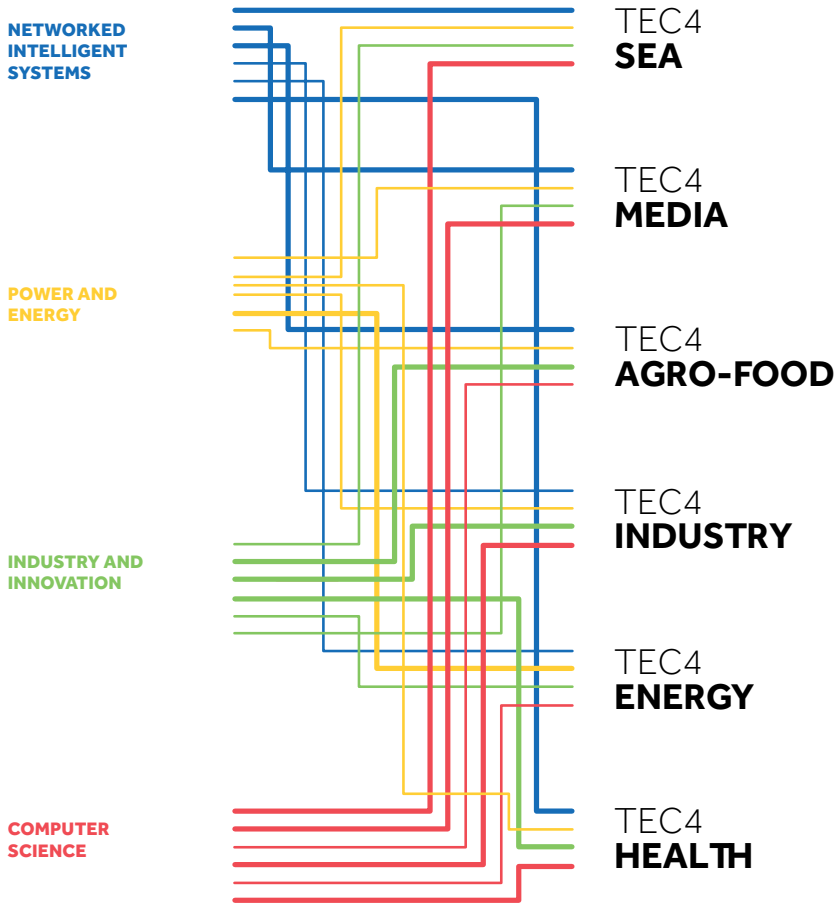
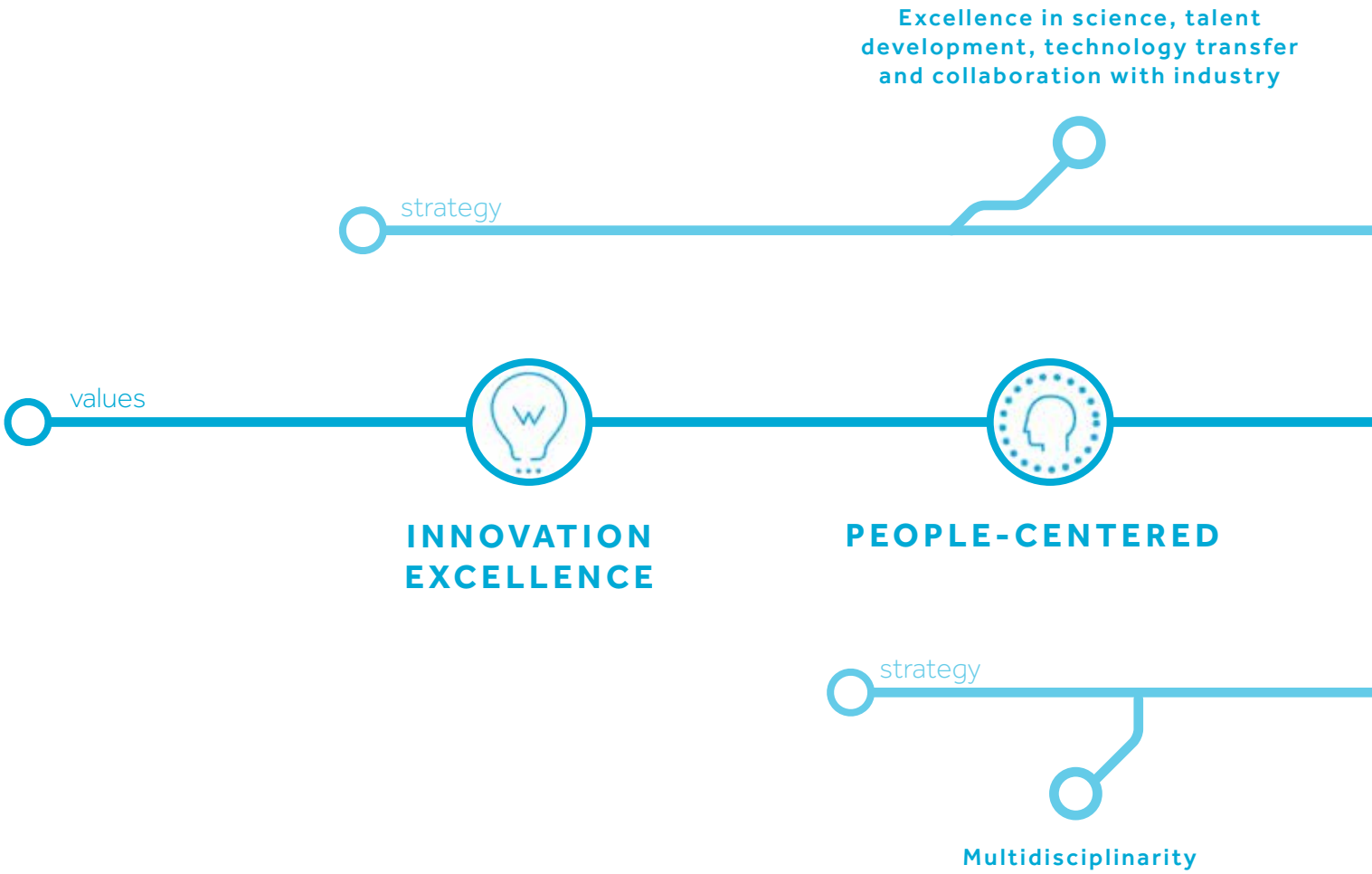


FIGURE 2
Putting pervasive intelligence to work

STRATEGY AND VALUES



Full coverage of the knowledge-to-value chain (TRL - Technology Readiness Levels from 1 to 9)

International visibility and presence

strategy

values

RESEARCH FREEDOM

COOPERATION

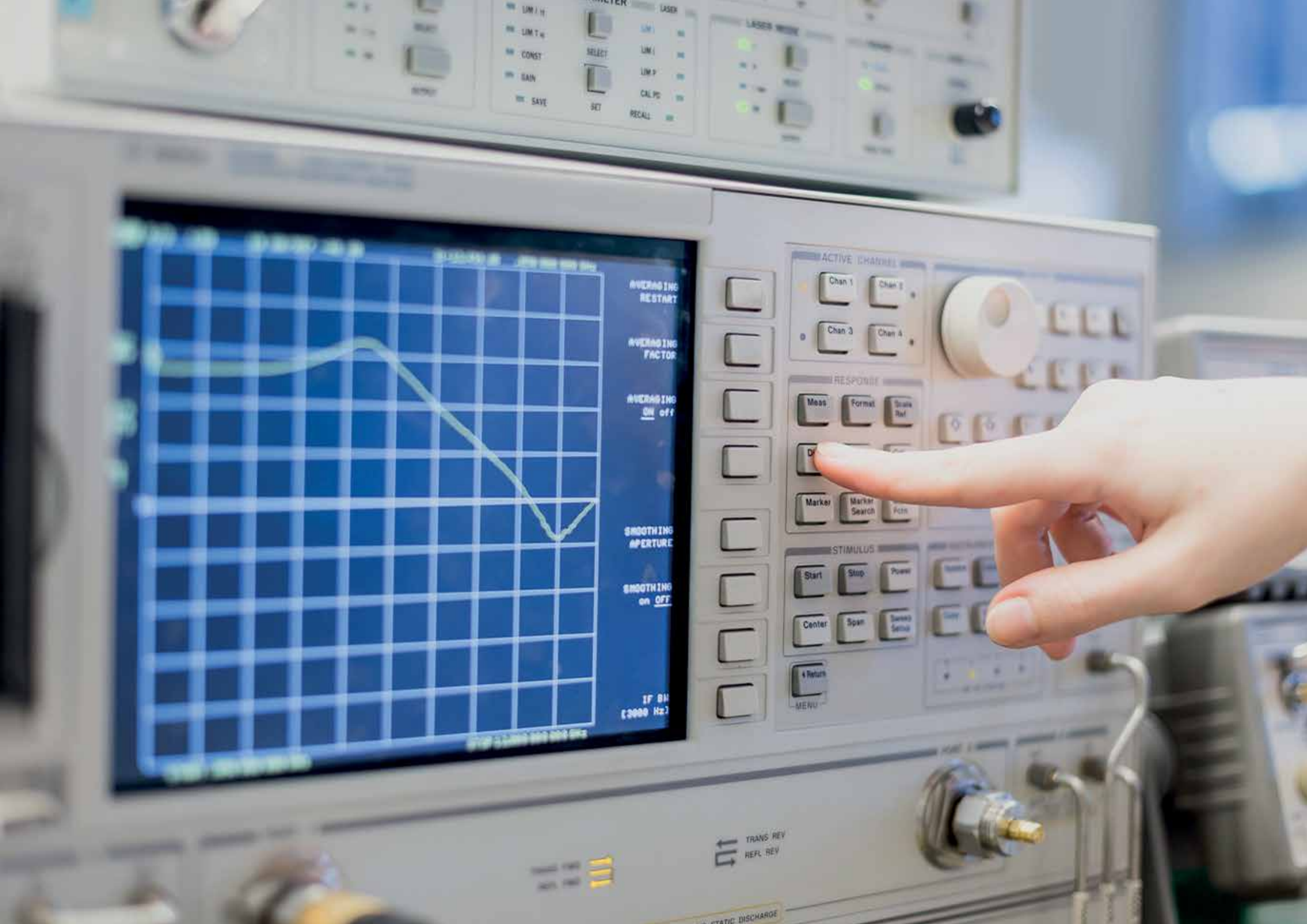
SOCIAL RESPONSIBILITY

strategy

Scale, density, critical mass and integration

1. OVERVIEW

CONSOLIDATED KEY FIGURES


ACTIVE CHANNEL
Chan 1
Chan 2
Chan 3
Chan 4
RESPONSE
Meas
Format
Scale Ref
Marker
Marker Search
STIMULUS
Start
Stop
Power
Center
Span
Return
MENU
AVERAGING RESTART
AVERAGING FACTOR
AVERAGING ON off
SMOOTHING APERTURE
SMOOTHING on OFF
TRANS REV
REFL REV

KEY FACTS

The only Portuguese R&D institution with projects in all the societal challenges addressed by the Horizon Europe Research Programme.

A diversified and sustainable activity and funding model, with a turnover of 17 M€, 262 R&D projects, and 28% of project funding from international sources.

A managed science model combining scientific freedom, strategy and impact.

Leader in patenting in Portugal, with 12 patents submitted and 6 granted in 2018.

A consolidated R&D and technology transfer environment hosting 745 integrated researchers, 339 with a Ph.D. degree.

One of the leading Portuguese organisations in scientific employment, with 102 researchers holding work contracts.

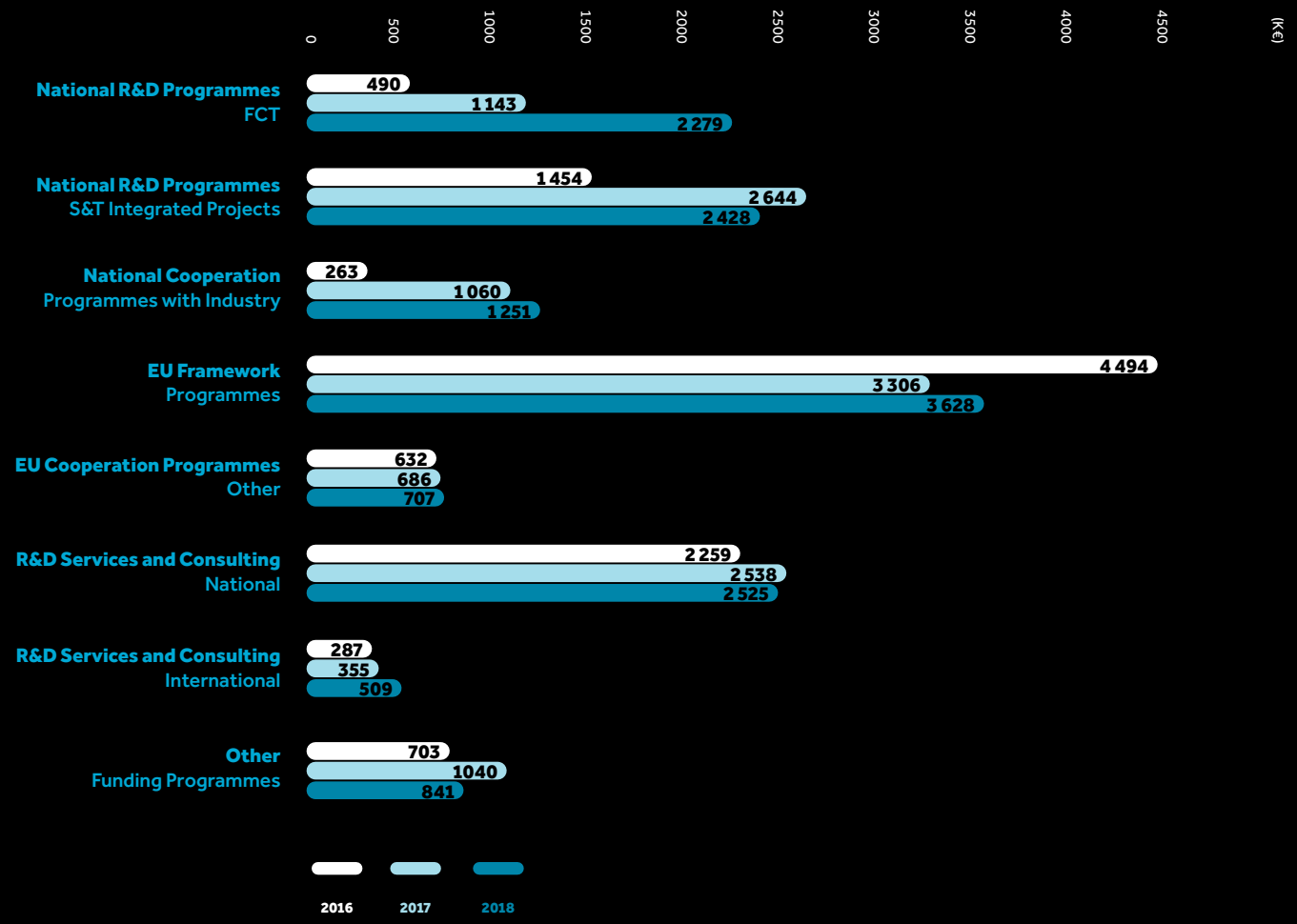
6% INCREASE IN ACTIVITY

FUNDING SOURCES

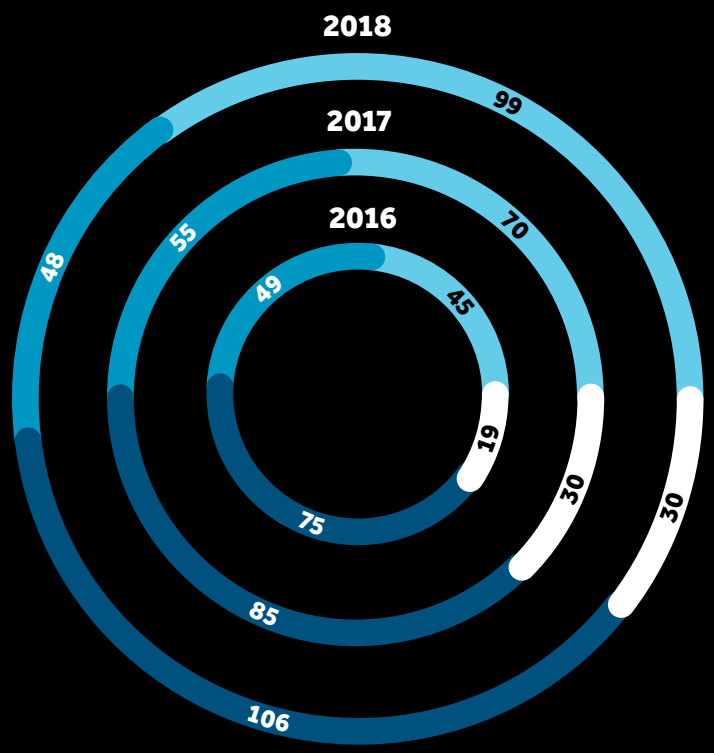
The activity level has grown steadily, with oscillations in the relative importance of the different funding sources, typically reflecting the cyclic nature of national and international financing programs.

17M€

ACTIVITY



+250
PROJECTS



National R&D Programmes
EU Programmes
R&D Services and Consulting
Other Funding Programs

FIGURE 3
Number of active projects by funding source.

HIGH QUALITY RESEARCH

PUBLICATIONS

Reflecting our focus in publishing in high-quality venues, the large majority (71%) of the papers have been published in first quartile (Q1) journals.

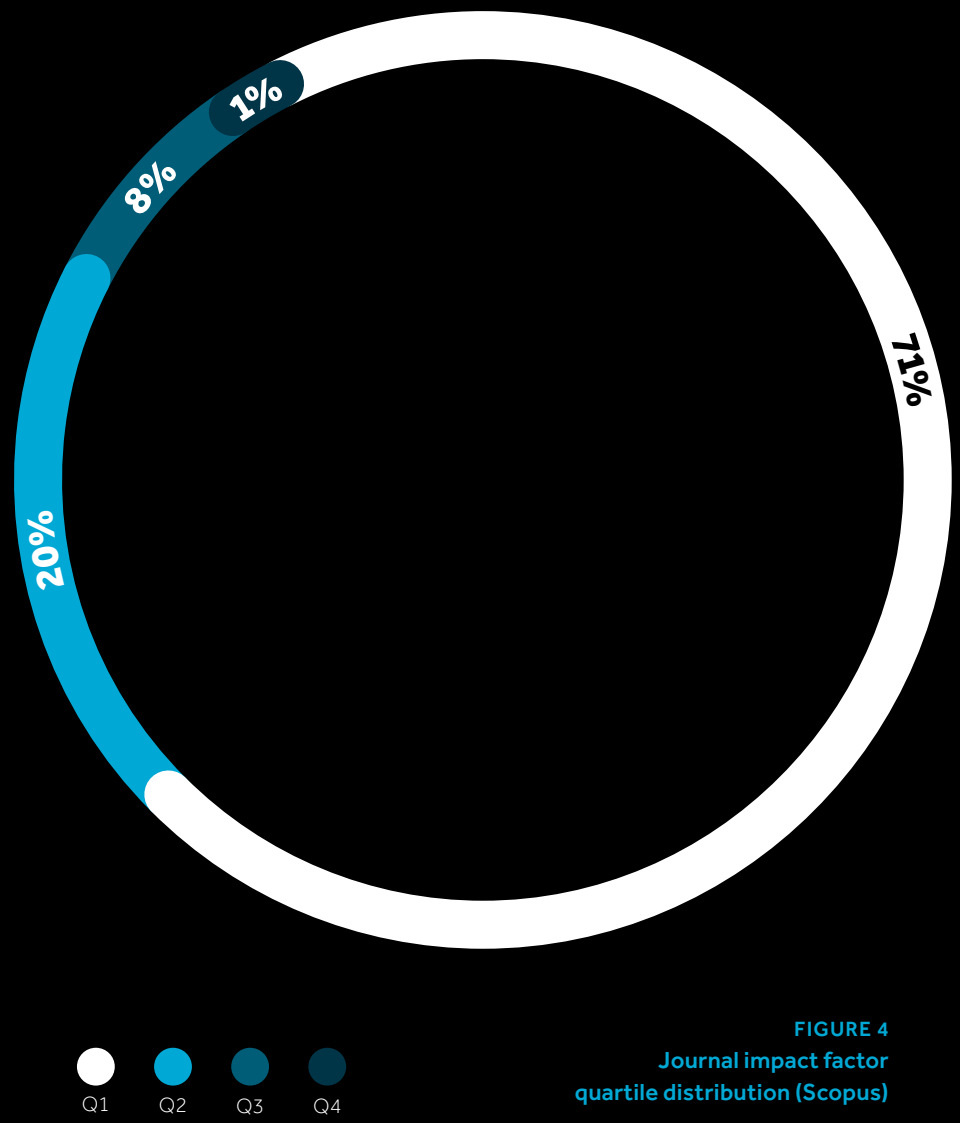


FIGURE 4
Journal impact factor quartile distribution (Scopus)

OVER 60 COMPLETED PHD THESES AND 740 INDEXED PUBLICATIONS

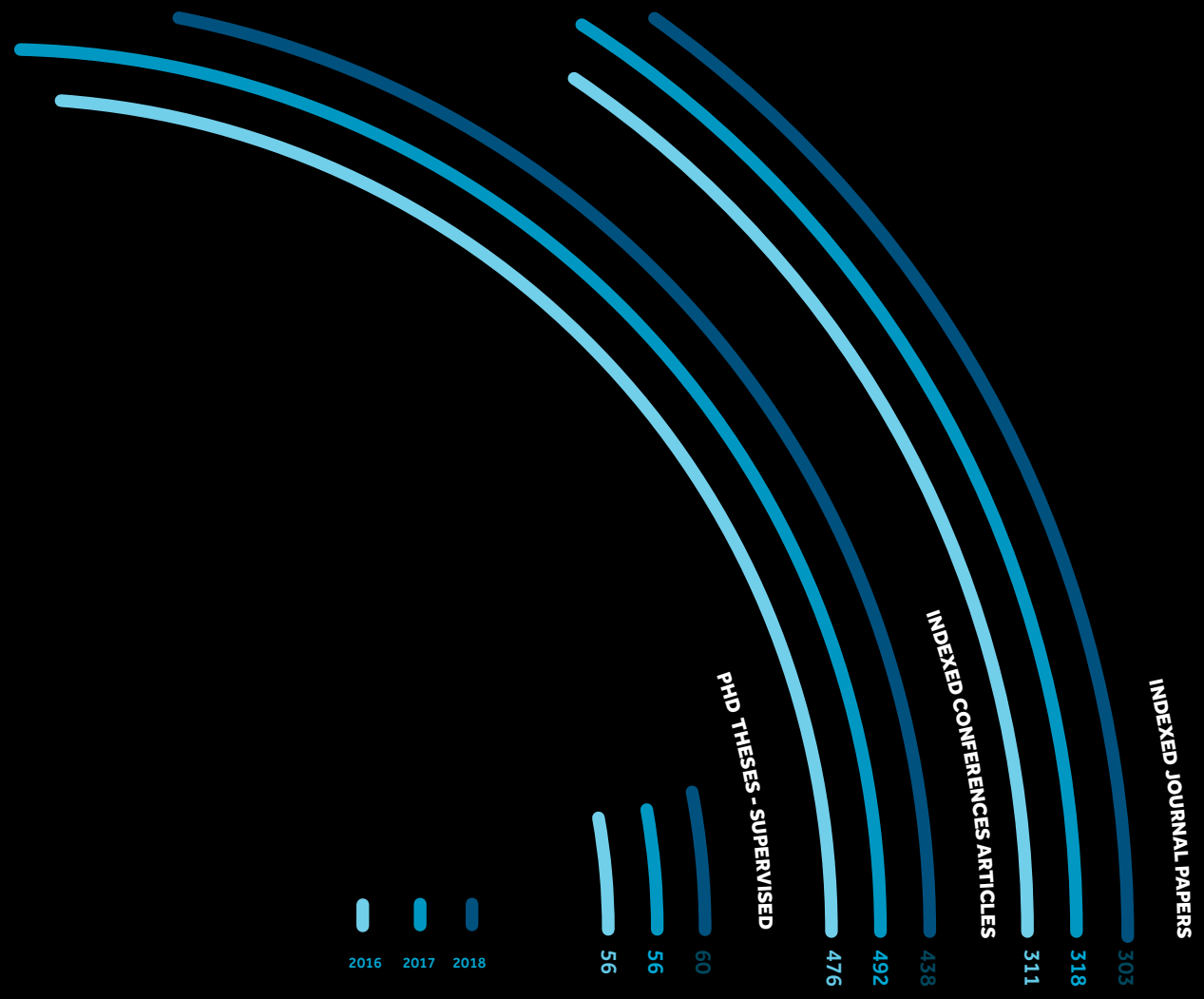
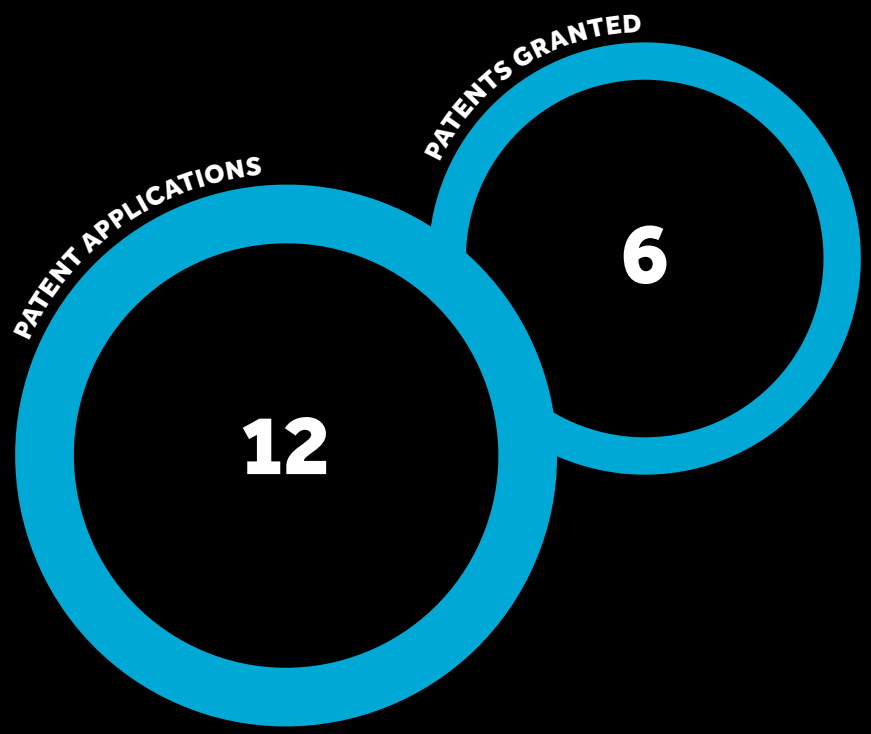


FIGURE 5
Evolution of Publications

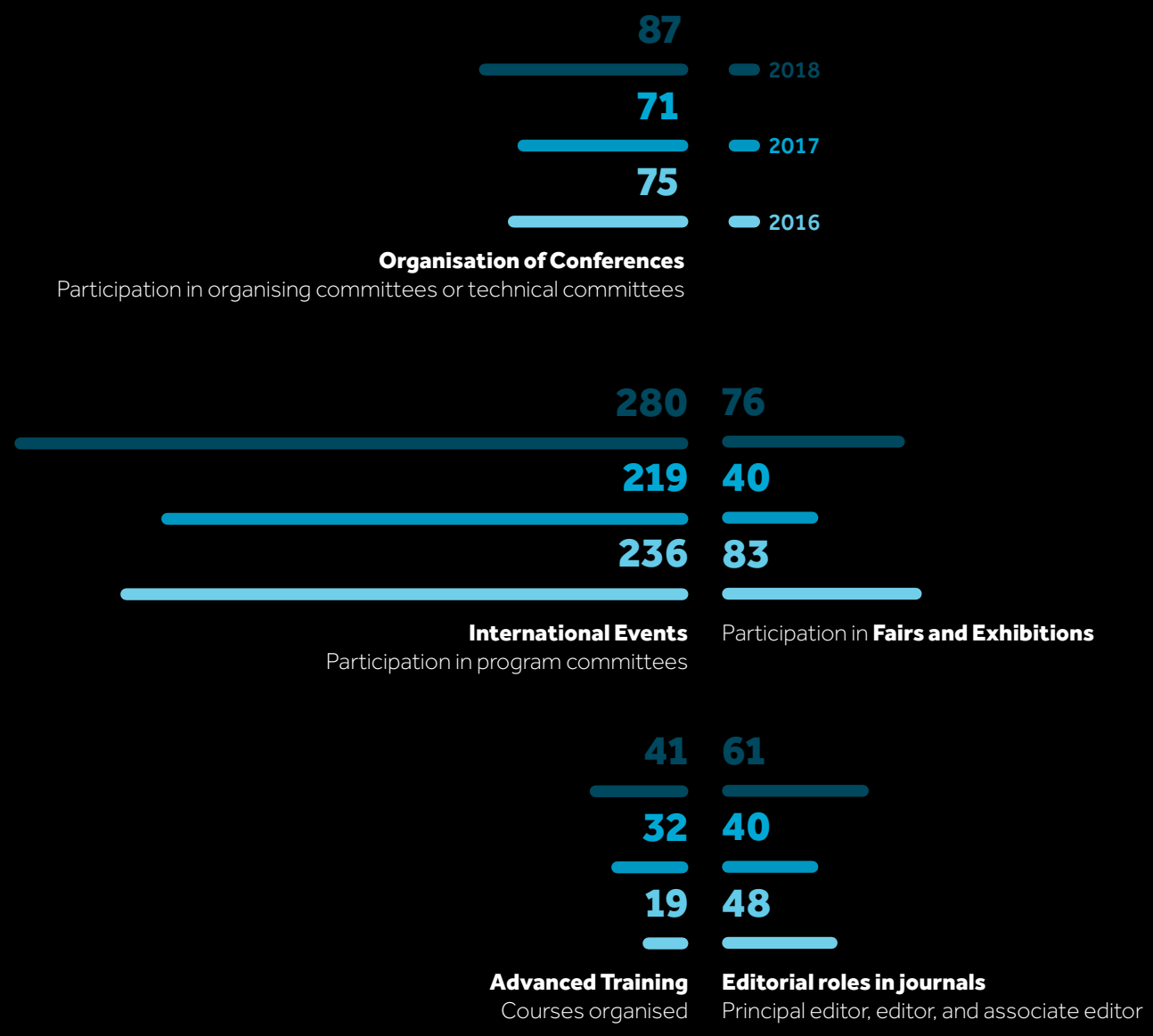
LEADER IN PATENTING IN PORTUGAL

IP PROTECTION, EXPLOITATION AND TECHNOLOGY TRANSFER



SHARING R&D RESULTS FOR THE PROGRESS OF SCIENCE AND THE BENEFIT OF SOCIETY

DISSEMINATION ACTIVITIES



339 RESEARCHERS WITH PHD

HUMAN RESOURCES

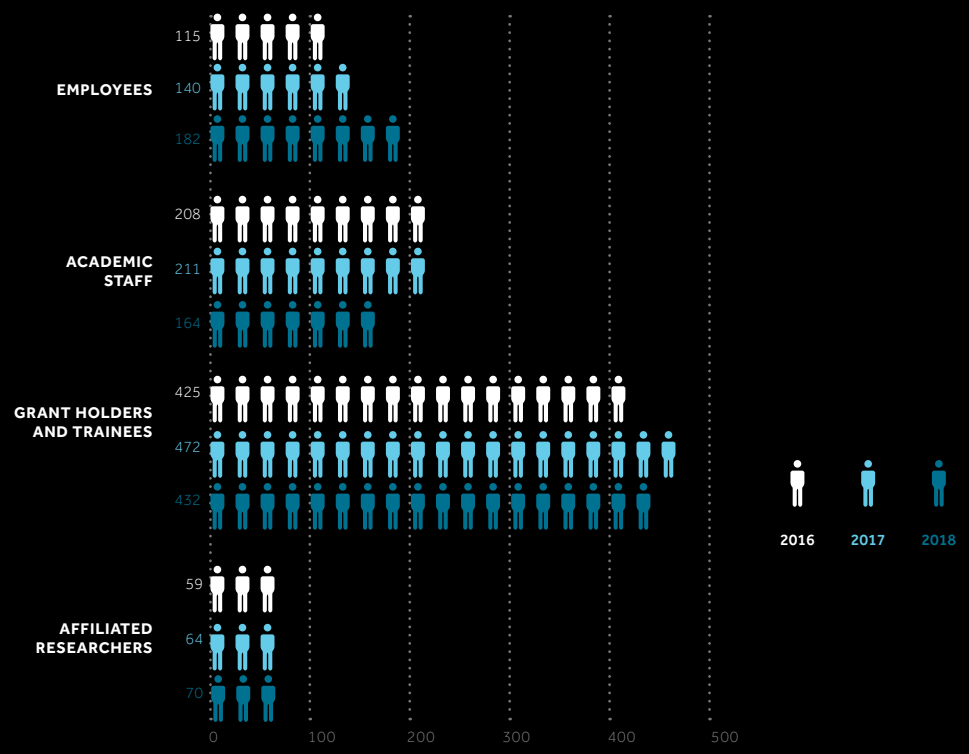
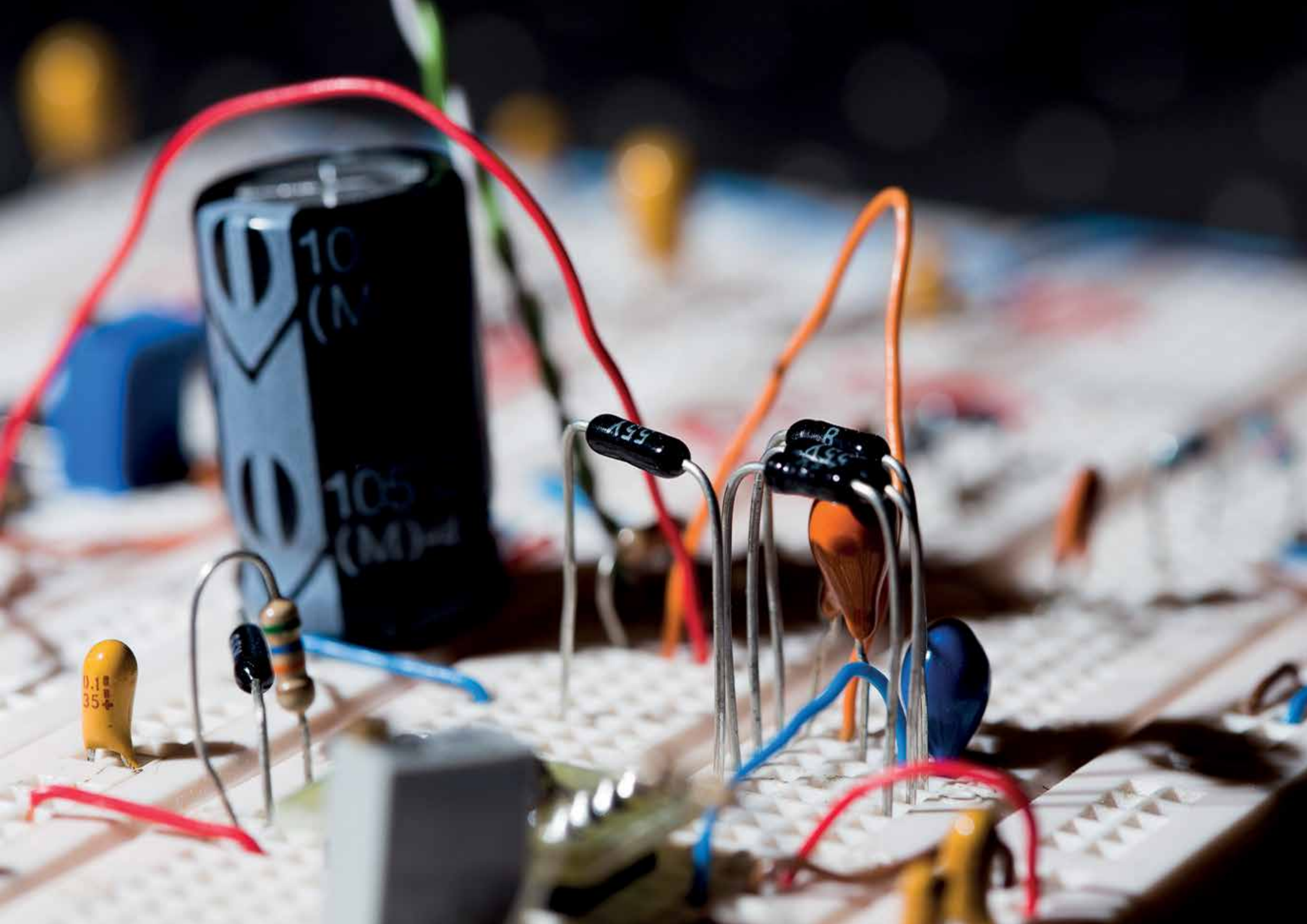


FIGURE 6
Evolution of Human Resources

1. OVERVIEW

GLOBAL ACTIVITY



PRIORITIES AND OBJECTIVES

The continuous pursuit of excellence is driven by INESC TEC's goals of international recognition and impact.

Scientific excellence

The consolidation of scientific excellence in INESC TEC's research domains, aiming at national and international recognition, is a permanent strategic priority for the institution. INESC TEC's Clusters are the structures responsible for defining and monitoring the implementation of its long-term scientific strategy.
The ongoing integrated R&D projects, focusing on important emerging scientific developments, aimed at renewing skills and developing critical mass, complementing the more upstream research supported by FCT projects and strategic funding from FCT. These projects have been an institutional investment to achieve scientific leadership in strategic areas and enable new European projects and research contracts with industry in the future.
The renewal of INESC TEC's position as an outstanding research unit, in the scope of FCT's evaluation process, was also one of the major scientific priorities.

Technology transfer and valorisation

Knowledge valorisation and technology transfer are key priorities for INESC TEC to achieve its goals of impact, social relevance and economic sustainability.
The realization of INESC TEC's virtuous funding model, with a balance between different types of funding sources, at a global level but also ideally in each Cluster and R&D Centre, whenever possible, was the result of an increased effort in promoting European projects, contract research, and advanced consulting and training for companies and other organisations.
The TEC4 initiatives and the Business Advisory Board have been instrumental for this objective, namely by assisting in addressing industry needs through multidisciplinary perspectives and approaches.
The significant ongoing effort in intellectual property protection, pre-incubation activities and spinoff creation, which increased in 2018, completes the efforts to strengthen knowledge valorisation and technology transfer.

Relationship with academic institutions

The collaboration with Higher Education Institutions is a foundational priority for INESC TEC. The institution has contributed actively to the on-going debate about the relationship between the University of Porto and its participated institutes. These contributions have already been instrumental in the preparation of the specific collaboration protocols with FEUP and FCUP.
Considering the dimension and diversity of the U.Porto universe and the fact that INESC TEC integrates faculty from different schools, the rich experience from the development of the collaboration protocols with U.Porto will potentially be useful in reviewing the protocols with the Polytechnic Institute of Porto (IPP), the University of Trás-os-Montes and Alto Douro (UTAD), and the University of Minho (UM), as well as the Polytechnic Institute of Bragança (IPBragança), the Universidade Aberta and other academic institutions, meeting the strategic guidelines of those institutions.

Contribution to public policies in R&D

Along the years, INESC TEC has been committed to the success of national public policies, more recently by maintaining its role as a key player in the partnership programs in Science and Technology between FCT and US Universities (first coordinating the UTEN initiative, then the CMU Portugal Program, and since 2018 the UT Austin Portugal Program), and being actively involved in the launch of new Collaborative Laboratories (CoLAB).

International activity

The reinforcement of international activity has been crucial for the growth experienced in the last few years. The orientations of the Business Advisory Board have also been decisive in defining the international positioning of INESC TEC.
The increase in European programmes participation, the consolidation of the activity in Brazil and the opening up to new horizons, namely Asia, remained priority areas in 2018.

Governance and internal organisation

As part of the evolution of the institution's governance model, the deployment of the Conflict of Interests Management Policy was an important priority in 2018, together with the efforts towards the approval of INESC TEC's Intellectual Property Regulation.
The continuous need to improve the efficiency of internal processes has been addressed with enhanced automation and IT support, not only to increase resource efficiency, but also to achieve higher flexibility and quicker response, as well as to support the measurement of performance indicators for different aspects and levels of the institute. These indicators aim to support strategic decision making and operational management in all its activities, namely by contributing to continuous improvement, as well as the overall maintenance of the institution's economic and financial stability.

MAJOR ACHIEVEMENTS

Following the outlined strategy, INESC TEC was able to meet and, in some cases, exceed its goals for 2018. The following are some of INESC TEC's main achievements during 2018.

6% increase in activity

The successful launch of new projects and activities supported an overall increase in activity of about 6%, consolidating the growth observed in previous years of 14% in 2014, 26% in 2015, 6% in 2016 and 16% in 2017. This outcome is evidence of the institution's resilience and ability to compensate the often-strong oscillations in individual types of funding sources caused by the cyclic nature of national and international financing programs.

43% increase in contract research and consulting with international companies

The balance between the different funding sources was successfully achieved by maintaining the level of funding for European projects, reinforcing the number of FCT projects (+34), and increasing in 43% the contract research and consulting activities with international companies.

Enhanced international standing

INESC TEC has been reinforcing its international presence and activity, maintaining its research partnerships within the MIT Portugal and CMU Portugal Programs, and starting the hosting of the coordination of the UT Austin Program.
In addition, the institution has strengthened its position as a member of several international consortia and associations, such as AirCentre, ASTP-Proton, CENTRA, EEN, EERA, EFFRA, IBM Q Network, and KIC EIT Raw Materials.
In 2018, INESC TEC was also one of the partners of the European consortium that was chosen for the creation of the KIC EIT Manufacturing, and one of the promoters of the initiative to create a Portuguese Hub of the KIC EIT Digital. INESC TEC also organised in 2018 the meeting of the European Commission's RISE Group in Portugal, as part of its Tour d'Europe.

The CIT Financing Program

In order to strengthen the support to its technology transfer and valorisation activities, INESC TEC applied successfully for competitive funding in the scope of a call of the CIT (Centros de Interface Tecnológico) Financing Program, having been awarded 2.2 M€ for a period of 3 years.

71% of the papers published in first quartile

In 2018, the number of indexed journal papers reached 303 and the number of indexed conference articles attained 438. In terms of indexed journal articles per core researcher with PhD, the figure went from 1.02 in 2017 to 1.20 in 2018 (+15%), while the per capita total indexed publications grew from 2.60 in 2017 to 2.86 in 2018 (+10%), revealing that INESC TEC publication effort was mainly directed to indexed journals.
Pointing to the high quality and impact of the research, the large majority (71%) of the journal papers have been published in first quartile (Q1) journals (according to SCOPUS).

Consolidated scientific production

Despite significant changes in INESC TEC's research team, namely an overall reduction of 4% in the total number of integrated human resources, the number of indexed journal papers (303) and the number of indexed conference articles (438) remained practically the same as in 2017. These numbers have been obtained using different indexing sources (ISI, SCOPUS) and have been gathered with the help of the Authenticus and CORE Platforms.
Pointing to the high quality and impact of the research, the large majority (71%) of the papers have been published in first quartile (Q1) journals (according to SCOPUS).

Portuguese leader in patent applications

In the area of intellectual property protection, it is worth highlighting the remarkable results achieved in 2018, due not only to the efforts of INESC TEC's researchers, but also to the impetus provided by SAL (Technology Licensing Office). During 2018, 12 patents were submitted and 6 patents granted.

Pre-incubation and launching of spin-offs

In 2018, INESC TEC formally moved to take an equity position in its spin-off MITMYNID (launched in 2015, as a result of the WIDERMOS Project developed by the Centre for Information Systems and Computer Graphics), dedicated to developing software and services in transport and logistics. INESC TEC was also involved as a partner and with an equity position in the launching of the spin-off UBIRIDER, which develops mobile and web apps combining traditional and modern ways of transportation.

44% increase in R&D employees

Hosting 745 integrated researchers, 339 with a Ph.D. degree, and 174 Ph.D. students at the end of 2018, INESC TEC's core research team changed significantly along 2018. The institution experienced an increase of 44% in R&D employees, to 102 researchers holding work contracts, in line with the national policies for scientific employment. In addition, after a thorough research team review process launched at the beginning of 2018, the composition of the academic staff team was revised, resulting in a 24% decrease of its size, to 155 faculty.

Key player in the development of successful public policies

INESC TEC actively participated in the national Collaborative Laboratories (CoLABs) initiative, created to meet the challenge of enhancing the density of knowledge-based activities in Portugal by fostering the collaboration between scientific and technological institutions and the social and economic fabric. INESC TEC led the creation of the CoLAB FORESTWISE, the Collaborative Laboratory for Integrated Forest and Fire Management, and actively participated in the consolidation of the CoLABs Vines&Wines and B2E (Blue Economy).
Finally, the institution was active in the launch of the Digital Innovation Hub for Customer-Driven Manufacturing @ Norte - iMAN Norte Hub, aiming to foster the digital transformation of manufacturing companies of the Northern Region of Portugal (Norte) and to nurture the respective innovation ecosystem.

Ambitious R&D management model

At an internal level, the Conflict of Interests Management Policy was fully implemented in 2018, placing INESC TEC at the national forefront on this topic. Like other European organisations, the compliance with the European General Data Protection Regulation was also one of INESC TEC's main concerns in 2018.

Launch of Internal Seed Projects

2018 was marked by the launch of the first call of Internal Seed Projects. This internal science instrument aimed at supporting projects in three categories: inter-centre research, junior researcher development, and commercialization proof-of-concept. The call solicited projects of a high-risk/high-reward nature, explicitly showing promise and a strategy for significant future expansion. The results of the first call were released in early 2019.

1. OVERVIEW

MAIN INDICATORS BY CLUSTER

ACTIVITY IN PROJECTS BY CLUSTER

This section includes the main indicators by cluster, providing an overview of each cluster's results in 2018.

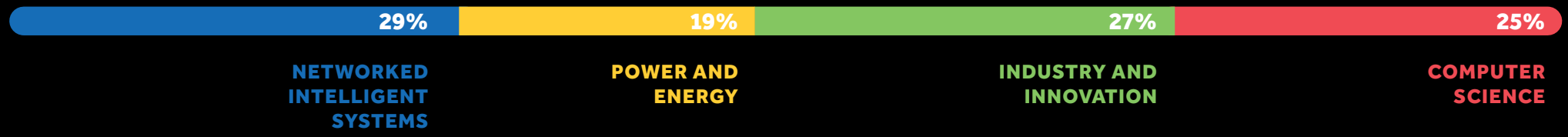


FIGURE 7
Project funding by Cluster

Financing Sources	NETWORKED INTELLIGENT SYSTEMS	POWER AND ENERGY	INDUSTRY AND INNOVATION	COMPUTER SCIENCE
National R&D Programmes - FCT	990	405	488	396
National R&D Programmes - S&T Integrated Projects	964	34	467	962
National Cooperation Programmes with Industry	475	56	519	201
EU Framework Programmes	719	855	953	1 100
EU Cooperation Programmes - Other	137	192	322	56
R&D Services and Consulting - Nacional	327	870	956	365
R&D Services and Consulting - International	246	98	73	93
Other Funding Programmes	126	27	30	228
Total Active Projects	3 984	2 538	3 808	3 401
Total Closed Projects	30	199	10	70
Total Funding	4 014	2 738	3 818	3 470

FIGURE 8
Project funding by Cluster (K€)

PUBLICATIONS BY CLUSTER

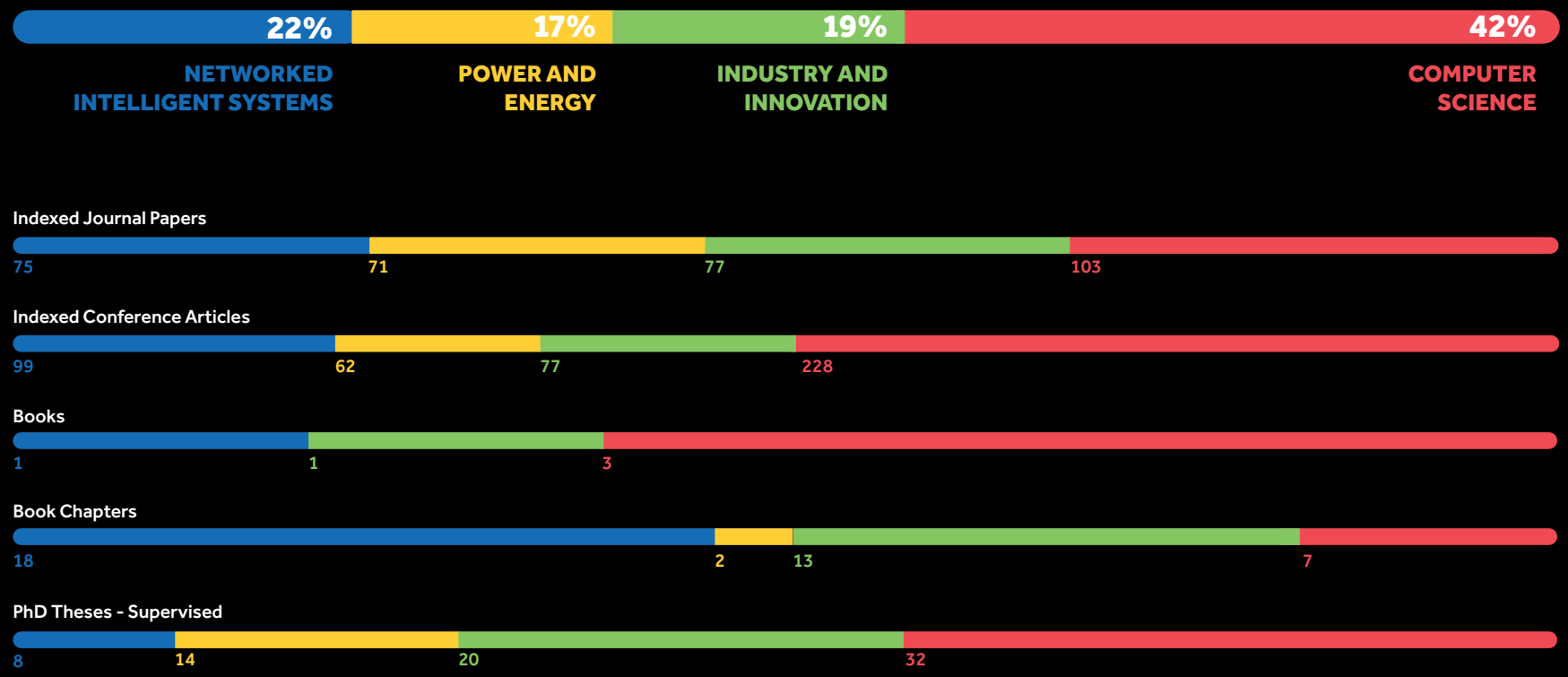


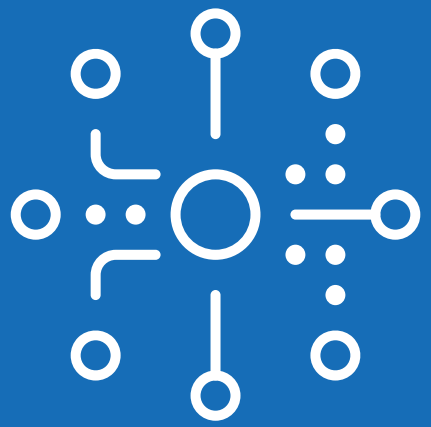
FIGURE 9
Number of Publications by Cluster

HUMAN RESOURCES BY CLUSTER

FIGURE 10
Total Integrated HR By Cluster

NETWORKED INTELLIGENT SYSTEMS

MAJOR ACHIEVEMENTS



Development of transversal deep information learning based on supervised learning and multiple instance learning framework for image quality and abnormality detection in medical images. This generic methodology has been applied with success to different image data, published in top-ranked journals, received a conference best paper award and achieved top-10 performance on histology, retinal segmentation and skin and eye surgery topics, in international competitions.

Development of a novel switched antenna array and MAC protocol running over standard IEEE 802.11 wireless cards for long-range, broadband ship-to-shore communications in alternative to Satellite communications, with the successful demonstration at the Lisbon Naval Base together with the Portuguese Navy.

Demonstration of compositional mapping in complex mineral using LIBS technology with the test case of lithium from Portuguese mines exploration, based upon novel LIBS signal processing schemes and calibration transfer protocols (2 EP submitted).

PISCES team was selected as one of nine finalists of the Shell Ocean Discovery XPrize international competition. The PISCES team approach is based on the combination of different marine robotic platforms to devise an effective and efficient solution for the exploration of the seabed. These platforms must be operated together and incorporate acoustic navigation and a mapping system.

POWER AND ENERGY

MAJOR ACHIEVEMENTS

Development of data-driven energy optimization strategies for a wastewater pumping station by using a combination of reinforcement learning and machine learning.

Development of a multi-temporal approach for the energy scheduling and voltage/var control problem.

Extension of dynamic simulation platforms previously developed under a scope of "inverter-dominated islanded power systems" to a simulation platform for 100% power electronic power systems, involving advanced modelling concept for grid forming inverters and its performance during fault conditions.

In the context of energy conversion, a new modulation for the power converter designed as High-Frequency Link Matrix Converter (HFLMC) was developed. The proposed space vector modulation is able to control the power factor in the power grid interface as well as voltage and current at load. An international patent application was submitted in order to protect the intellectual property of this work. The patent was already granted in the United States and the regional processes in Europe and Japan are ongoing.

INDUSTRY AND INNOVATION

MAJOR ACHIEVEMENTS

Digital Maturity and Road-mapping. Several contract-based research projects were successfully implemented to evaluate the digital maturity and define relevant technological roadmaps, in companies of strategic importance for future research activity. These projects were supported by a reference framework developed by INESC TEC, considering industry 4.0 concepts and technologies.

Multi-perspective performance evaluation. A new approach for evaluating firm's Corporate Social Responsibility, based on the Theory of Performance Frontiers from operations management, using quantitative methods and a proof of concept of an intelligent dashboard that identifies operational inefficiencies in advanced health care management and healthcare logistics, was successfully designed and tested.

Mobile Collaborative Robots. A collaborative mobile manipulator that it is capable to autonomously navigate inside of a vehicle and perform several non-ergonomic fastening operations, sharing both its working space and task with a human operator, was developed in the context of the ColRobot H2020 project.

Business Ignition. Twelve technologies were evaluated during the 3rd edition of the Business Ignition Programme, a ERDF co-funded project promoted by U.Porto Inovação, CIIMAR and INESC TEC. The initiative developed a state-of-the-art programme to build and test alternative business models for the exploitation of technologies developed in academia.

COMPUTER SCIENCE

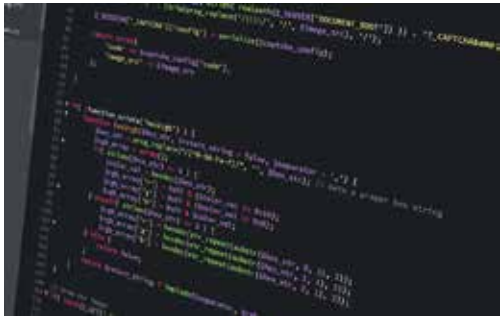
MAJOR ACHIEVEMENTS

Publication of "Indifferentiable Authenticated Encryption", where the theoretical foundations for analysing and constructing strong forms of encryption schemes were launched, and of "Delta State Replicated Data Types", that establishes the foundations for efficient synchronization of state in global systems, and that has already led to several industrial implementations.

Leveraging on the work done in the HYRAX project, we now address the challenges put forward by the IoT security and privacy in a new Portugal-CMU project called Angerona.

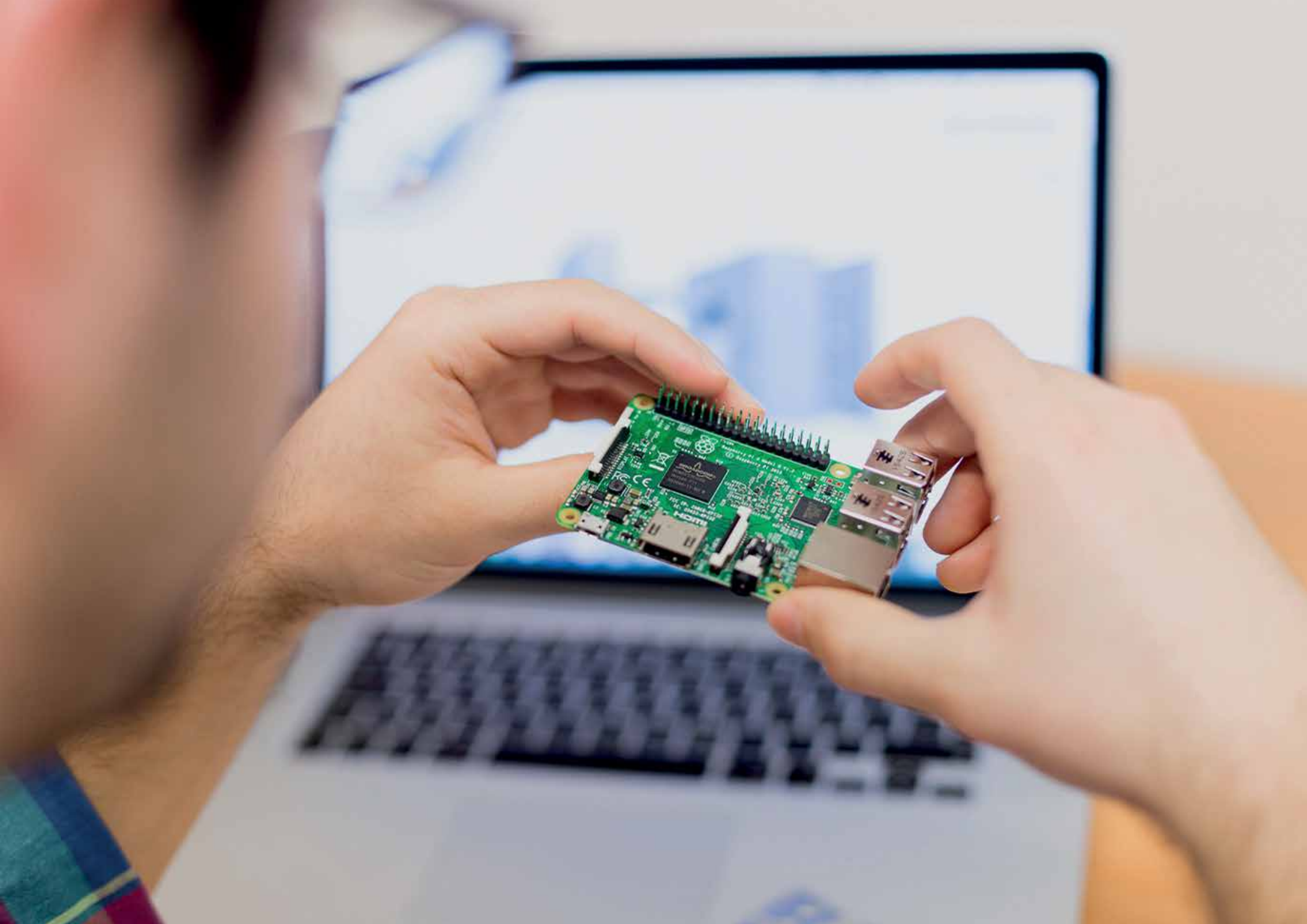
Conclusion of the Google DNI funded project Algorithmic Science News (ASN), and start of the project Stop PropagHate, another Google DNI funded project.

Arquivo.pt prize awarded to the web portal "Conta-me histórias", which, given a topical query, has the capability of going through the Portuguese web archive and produce a proto-narrative in the form of a chronological sequence of relevant statements extracted from the news.



1. OVERVIEW

TECHNOLOGY ENTREPRENEURSHIP

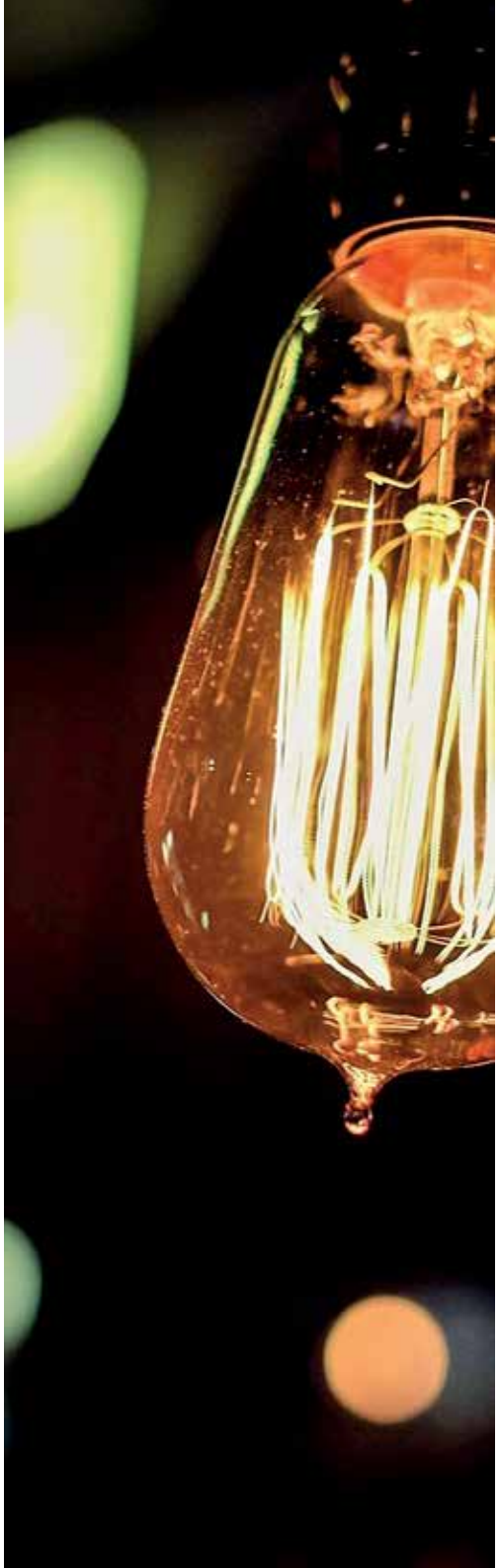


THE PORTUGUESE INSTITUTION WITH MORE PATENT APPLICATIONS WITHIN EUROPE

INESC TEC is the Portuguese institution that filed more patent applications at the European Patent Office (EPO) in 2018. In total, Portugal filed 220 patent applications, 9 of which by INESC TEC.

The report of the Portuguese Institute of Industrial Property (INPI) shows that INESC TEC submitted 12 patent applications at a national level, being the R&D institute that belongs to the wide scope of consolidation of the University of Porto with more patent applications filed in 2018.

In 2017, INESC TEC already ranked in second place in terms of the number of European patent applications filed by Portuguese entities.



INESC TEC IS THE FIRST PORTUGUESE INSTITUTION IN THE EUROPEAN TTO CIRCLE

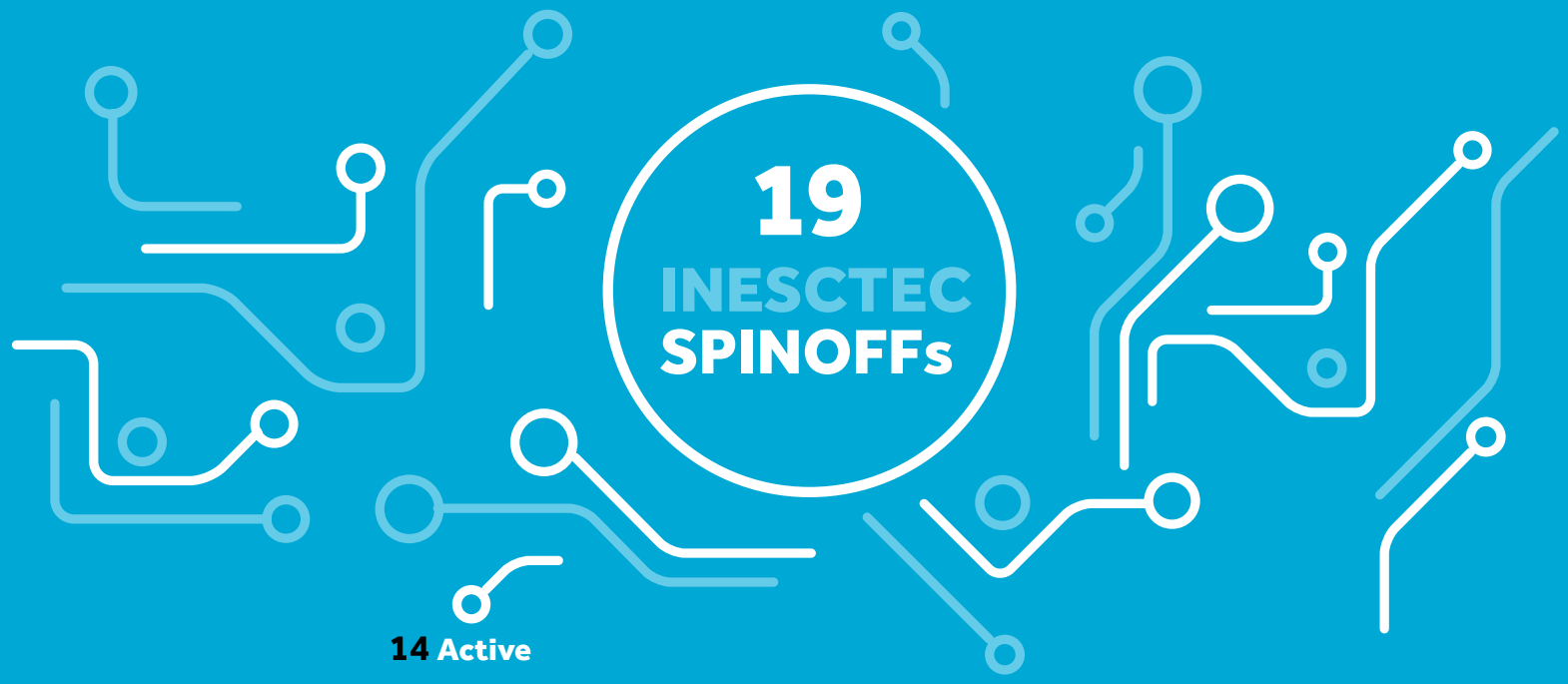
INESC TEC is the first Portuguese institution to be part of the TTO Circle, the European Technology Transfer Offices circle, a European Commission's initiative.

The TTO Circle gathers some of the largest European research institutions such as CERN, ESA, Fraunhofer, Tecnalia or TNO, aiming at sharing the best practices and knowledge in technology transfer in order to develop joint activities and a general approach regarding the international standards, thus professionalising the activity and promoting it for the European markets.

Only 31 research institutions are part of the TTO Circle, all of them being large-scale institutions with a solid and well-defined strategy. INESC TEC met all these conditions.

PRE-INCUBATION OF SPIN-OFFS IN THE LAST 30 YEARS

The pre incubation service supports high impact, early-stage technological entrepreneurs, by mentoring, coaching, technological and business consultancy, supporting the development of technology-based entrepreneurial projects.



14 Active

Fund Raising

Ubirider
Prewind
FiberSensing
SmartWatt
Xarevision
MitMyNid
LTP

INESC TEC Equity

SafeCloud
WeSenss
inSignals
MOG Technologies
Novabase
Medidata
CF&A Associados

5 No longer active

Fund Raising

NextToYou
Tecla Colorida
Kinematix
Audolici
4VDO

INESC TEC Equity

RECENT ACTIVE SPIN-OFFS

HBM FiberSensing
German company Hottinger Baldwin Messtechnik GmbH (HBM) buys FiberSensing 10 years after its foundation. HBO FiberSensing becomes a world reference provider of advanced monitoring systems of optical products and OEM (Original Equipment Manufacturer) solutions.
Sectors: Sensoring, Energy and Industry,
> 60 Jobs Created

MOGTechnologies
An information technology company that provides centralized ingest solutions, cloud services and MXF development tools.
Sectors: Telecommunications and Media.
> 40 Jobs Created

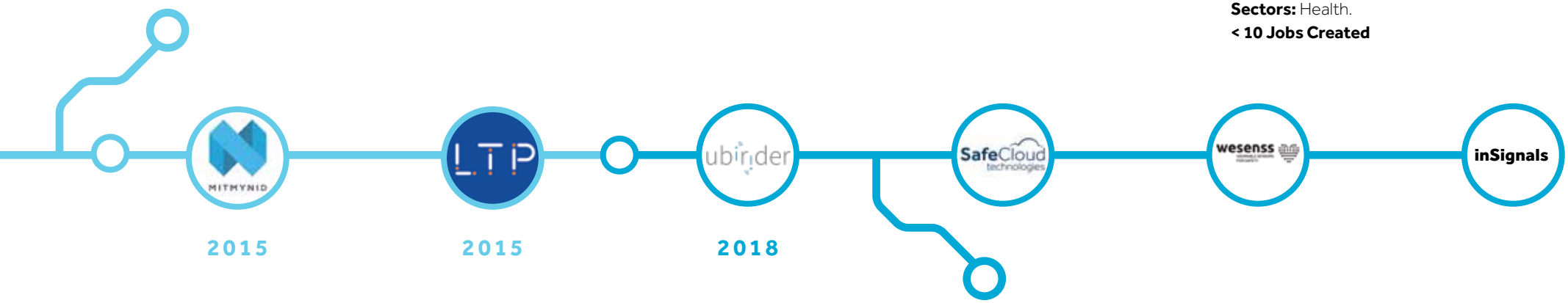
Xarevision
As leader in technologies for retail and an expert in the areas of corporate tv, digital signage and queue management, this company administers broad digital networks of centrally managed displays.
Sectors: Digital Networks and Corportate TV.
> 20 Jobs Created

Smartwatt
This company develops systems that guarantee a better decision-making process during operation and maintenance of the energy assets by forecasting the weather, incidents, consumption, production and other key-performance indicators.
Sectors: Energy and Forecasting.
> 10 Jobs Created

Prewind
Forecasting services for the energy sector, this company develops prediction models to forecast wind power.
Sectors: Energy.
> 10 Jobs Created

Ubirider
Develops solutions to make urban mobility smarter and to improve travellers' overall experience. Pick is an universal app which integrates any mobility service for multimodal trip planning and mobile payment of fares.
Sectors: Transports and Public Sectors.
< 10 Jobs Created

WeSenss
Wearables & IoT platform for hazardous professionals' vitals and work environment monitoring. B2B oriented start-up to design and implement corporate solutions for the security and quantified occupational health approaches to promote worker's wellbeing and better performance.
Sectors: Health.
< 10 Jobs Created



MitMyNid
Develops innovative and simple solutions for complex problems. BIZCARGO.com is an online marketplace to search and compare the best transport and logistics services with multimodal and door-to-door solutions.
Sectors: Transports, Logistics and Industry,
< 10 Jobs Created

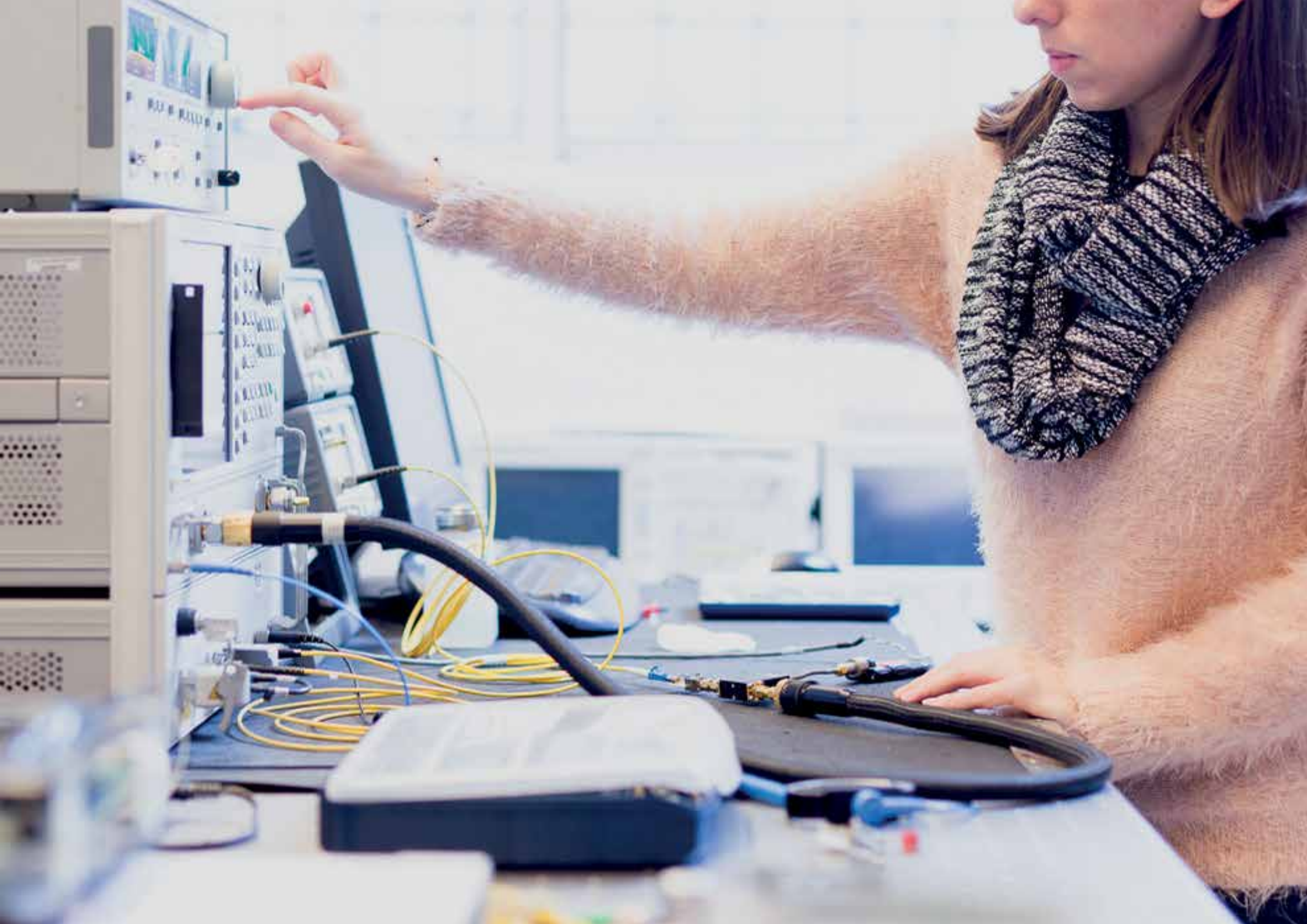
LTP Labs
Provides highly customized analytical-driven management consultancy for all types of industries and clients open to innovative analytical solutions that translate into economic benefits.
Sectors: Industry, Retail, Telecommunications, Health, Transport and Logistics.
> 30 Jobs Created

SafeCloud Technologies
Offers highly specialised consulting services on data privacy, distributed systems, and large scale infrastructures. This company focus on solving specific challenges providing both advice as well as hands-on contributions.
Sectors: ICT.
< 10 Jobs Created

inSignals
Quantified Deep Brain Stimulation (DBS) effects' monitoring in the operating room for stereotactic neurosurgery electrode placement optimisation and ambulatory patient rigidity follow-up for a closer DBS parameter setting, promoting Parkinson's Disease (PD) patients' better quality of life.
Sectors: Health.
< 10 Jobs Created

1. OVERVIEW

PEOPLE



INESC TEC AS THE STARTING POINT FOR A PROFESSIONAL JOURNEY OF EXCELLENCE

When a young researcher joins INESC TEC, he/she can choose various paths:

• Join R&D top projects while pursuing PhD or MSc studies, or even before, in the first years of graduate studies.
• Be a researcher at INESC TEC on the most exciting fields before moving to industry.
• Be a researcher at INESC TEC as a career goal.
• Create his/her own science based start up with INESC TEC's support.

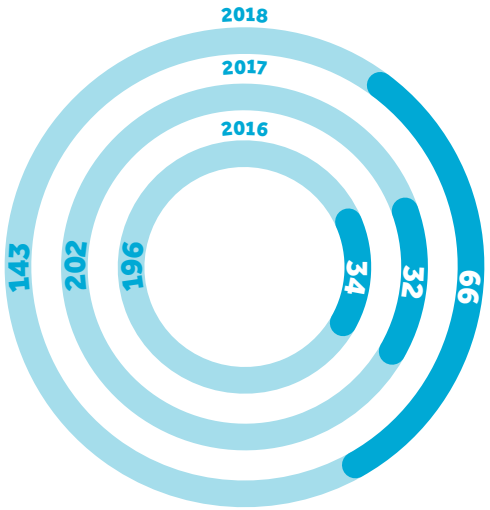
THE CHALLENGE

INESC TEC is a challenging place to work and for self-improvement:

• A multicultural, international and collaborative environment that makes it easier to exchange ideas, work in networks and create synergies.
• The possibility of working in international projects with some of the most important companies in the field.
• Mentoring with the best researchers in the fields of electrical and industrial engineering, bioengineering, information technology and physics.
• Internal Training sessions such as communication sessions, media sessions, social media sessions or writing papers coaching.
• The possibility of participating in international conferences, workshops, seminars and vocational training.
• Annual informal events, such as the multicultural party.

TALENT INCUBATOR

More than 200 professionals/year transferred to market per year (18 countries).



Be/MSc
PhD

FIGURE 11
INESC TEC HR transferred to market

A PROUD INSTITUTION

Limelight

In a universe of more than 1200 collaborators, there are many collaborators who had a performance in 2018 suitable for "Limelight".

Hugo Choupina
C-BER

Joana Paiva
C-BER

Vitor Mangaravite
LIAAD

Rita Barros
AJ

Artur Rocha
CSIG

João Paulo
HASLab

José Pedro Pinto
CTM

Hélder Fontes
CTM

Ricardo Cruz
CTM

Carlos Leocádio
CTM

Pedro Macedo
CPES

Carla Gonçalves
CPES

David Rua
CPES

Pedro Regadas
SCOM

Catarina Carvalho
SCOM

Teresa Araújo and **Guilherme Aresta** **C-BER**

Duarte Dias and **Susana Rodrigues** **C-BER**

Daniel Vasconcelos **SAL** and **Ricardo Araújo** **CTM**

Eurosys Team **HASLab**
Catarina Fernandes, Lídia Vila Boas and Paula Rodrigues

Open Day CTM Team **CTM**
Nuno Almeida, Pedro Silva, Tiago Costa, Joana Tavares

Project SUNNY Team
Sara Costa Freitas **CRAS**, Rui Campos **CTM**, José Miguel Almeida **CRAS**, João Pedro Ribeiro **CRAS**, Hugo Silva **CRAS**, Hélder Fontes **CTM**, Guilherme Amaral **CRAS**

PROJECT PISCES TEAM CRAS

Nuno Cruz, Carlos Gonçalves, Bruno Ferreira, Aníbal Matos, Andry Pinto, Ana Rita Gaspar, Alfredo Martins, Alexandra Nunes
Vitor Pinto, Eduardo Silva, Guilherme Amaral, Hugo Ferreira, Jorge Barbosa, José Carlos Alves, José Miguel Almeida, Nuno Abreu

1. OVERVIEW

EVENTS AND EXHIBITIONS

STAMINA
tamina
CLARiSSA
Dual-Arm Structural Steel Fa

INESC TEC AUTUMN FORUM

"The companies that create the digital. The companies that are recreated by the digital."
Regular and thematic event organised by INESC TEC | 240 participants

It is through this event that INESC TEC continues to focus on the debate of themes essential for the development of society. The 2018 edition was attended by the Minister of Science, Technology and Higher Education, Manuel Heitor, as well as other national and international guests. In this 4th edition, the theme was, in general, Digital Transformation, following the perspective, on the one hand, of companies that "invent" and produce the software, and, on the other, those that, through digital, can transform and reinvent themselves.

PARTICIPATION IN EVENTS

Hannover Messe The world's leading trade show for the manufacturing industry, took place on 23 and 27 April in Hannover, Germany.

Business2Sea - Sea Forum 2018 Was held between 14 and 16 November at the Alfandega Porto Congress Centre.

AgroGlobal The largest agricultural fair in Portugal, took place in Valada do Ribatejo (Santarém) between 5 and 7 September.

European Utility Week INESC TEC participated for the first time, with its own stand, in the largest European event of the power system sector.

FIMA INESC TEC, in conjunction with HERCULANO, attended the International Fair of Agricultural Machinery (FIMA), one of the best European trade shows on agricultural industry.

Summer Innovation Campus The University of Trás-os-Montes and Alto Douro (UTAD) promoted the first edition of the Summer Innovation Campus.

EMAF Under the TEC4INDUSTRY initiative, INESC TEC was once again present at the 17th International Fair of Machinery, Equipment and Services for Industry (EMAF).

VISITS OF COMPANIES/ INSTITUTIONS TO INESC TEC

Secretary of State for Business, Energy and Industrial Strategy of the United Kingdom
A visit to search for scientific and engineering expertise, not only from the fundamental science point of view, but also for support in creating startups.

Delegation of the Airbus group
An initiative made under a technology-scouting visit to research institutions aiming to identify potential partners.

Minister of Science and Technology of Nigeria
A visit to give the opportunity to interact with the Portuguese scientific community in their research and work environment.

Representatives of the Politehnica University of Timisoara, Romania
An initiative to present the work developed at the Institute, namely in the fields of Innovation, Entrepreneurship and Energy.

Delegation of professors from Universities of Vietnam
The goal of this visit was to share the experience and the benchmark in the technology transfer of INESC TEC under the VETEC Project (Vietnamese European Knowledge and Technology Transfer Education Consortium).

CEO of Microsoft Portugal
Under the initiative of reinforcing the link between these two organisations, in particular in the strategy framework of the digital transformation at the head of the companie's innovation philosophy.

Delegation from the Brazilian Government
The goal was to present the institution and its way of operation, as well as to discuss prospects for cooperation with several entities.

ADVANCED TRAINING / PARTNERSHIPS FOR COMMUNICATION OF SCIENCE

VISUM Summer School
A non-profit summer school that aims to gather PhD candidates, Post-Doctoral scholars and researchers from academia and industry with research interests in computer vision and machine intelligence.

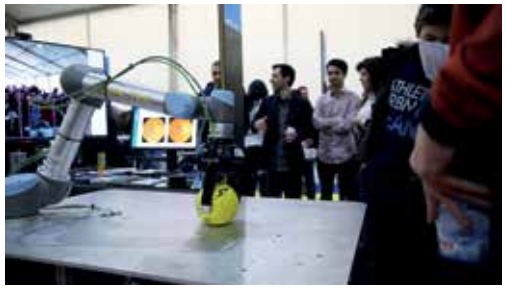
Encontro Ciência 2018
Ciência 2018 is the annual meeting of Portuguese researchers that aims at promoting a broad debate on the main topics and challenges of the scientific agenda beyond the world of research.

Collaboration with Ciência Viva in disseminating science to young people
The involvement of students in a scientific internship in INESC TEC's laboratories happens every year.

Participation in other awereness activities for science

Semana Profissão Engenheiro da FEUP
INESC TEC participated once again in another edition of SPE (Engineering Week), an annual exhibition organised by the Faculty of Engineering of the University of Porto (FEUP).

European Researcher's Night
"Conta-me Histórias" and UNEXMIN projects were presented in the European Researcher's Night, a initiative of the European Commission that takes place simultaneously in more than 30 countries.



Mostra UP
«Dont' give up on you!» This was the slogan chosen by the University of Porto to lead the 16th edition of Mostra of the University of Porto.

Reception of the FEUP new students
About one hundred students from the Faculty of Engineering of the University of Porto (FEUP) had the opportunity to get to know the research work carried out daily at INESC TEC's labs.

EVENT SPONSORSHIP

Sponsorship to events mainly organised by students with the purpose of attracting talent to INESC TEC.

- 9th Symposium on Bioengineering (FEUP/ICBAS)
- Competição NEEEIL IT Eletrotecnia e Computadores (FEUP)
- Bin@Porto (FEUP)
- Team Weekend da ANEEB - Associação Nacional de Estudantes de Engenharia Biomédica (national)
- FEUP Summer Sunset (FEUP)
- Jornadas de Eletrotecnia (FEUP)
- Concerto de Ópera na Academia e Cidade (FEUP)
- Talk a Bit Conference (FEUP)

INTERNAL EVENTS

INESC TEC On the Move - Team Building Activity
Initiative that includes a set of activities capable of developing and reinforcing the knowledge and interaction between members of an organisation.
13 June | City Park | 70 participants

INESC TEC on Foot – hiking activities
5 May | Sistelo | 70 participants
29 September | Paredes de Coura | 65 participants

Strategic Meeting
Event organised to reflect and discuss structural issues for the Institution's future.
14 September | Axis Vermar Hotel | 280 participants

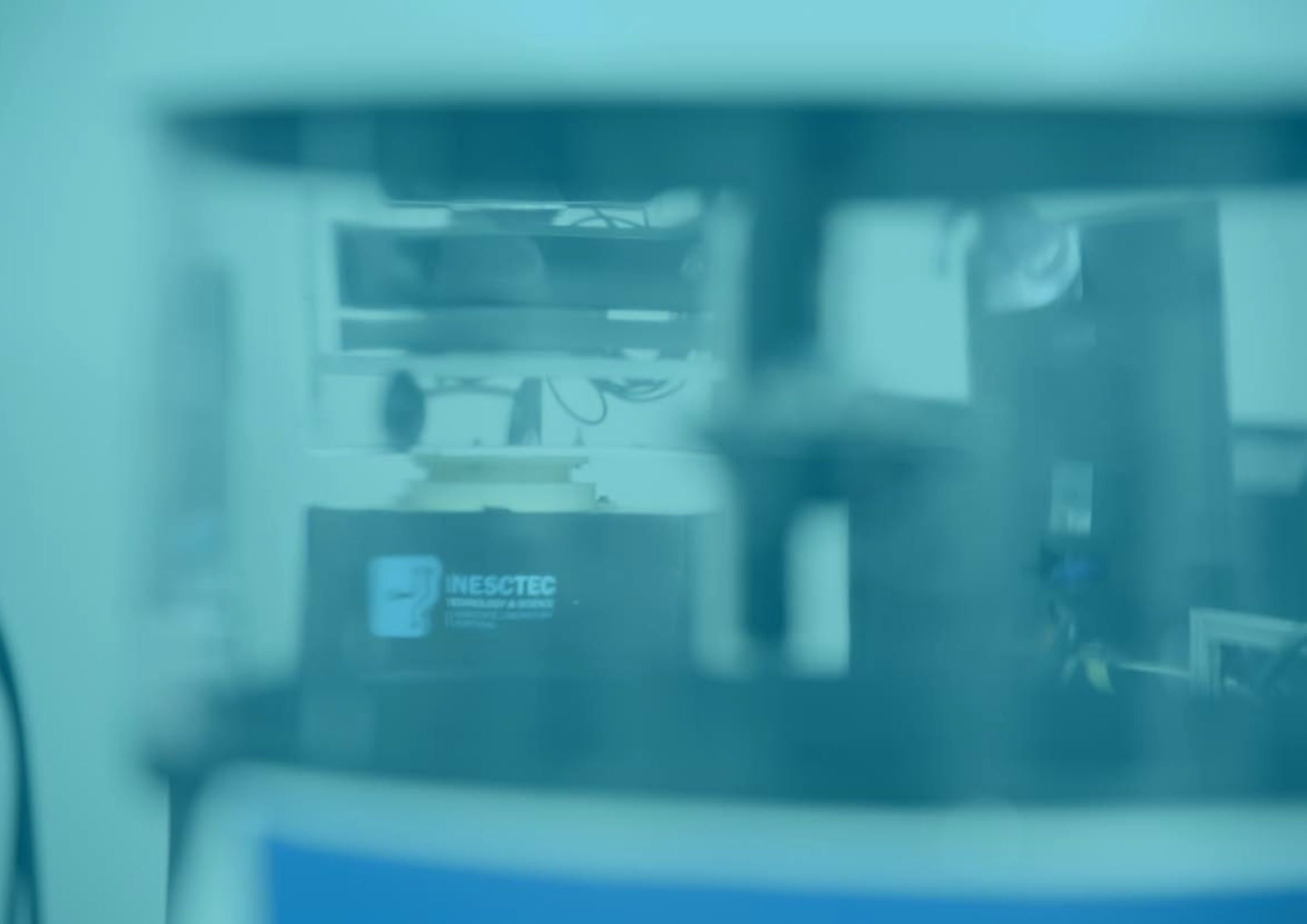
"Holidays 2018" Photo Competition
September | 19 candidates

Welcome Session for new collaborators
11 sessions/year | 180 participants

Roasted Chestnuts party
12 November | INESC TEC | 150 participants

Charity campaign
December | "INESC TEC helps children in need"

Multicultural Party and awards-giving ceremony
14 December | INESC TEC | 200 participants


INESCTEC

2

MANAGEMENT MODEL AND HIGHLIGHTS

2. MANAGEMENT MODEL AND HIGHLIGHTS

MANAGEMENT MODEL

ORGANISATIONAL STRUCTURE

The high-level management of INESC TEC is undertaken by a Board of Directors, composed of nine members, and an Executive Board, composed of three members from the Board of Directors.

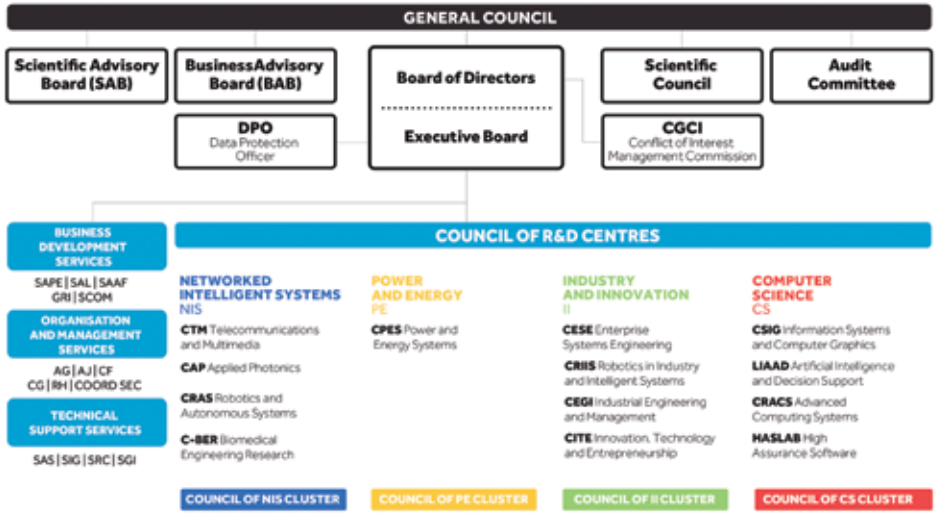
The Boards act in coordination with the Council of R&D Centres, meeting every other week with the Centre Coordinators and Service Managers. This ensures institution-wide coherence in vision and policy, and joint responsibility and commitment in both strategic and operational management decisions.

The external Scientific Advisory Board audits the institute's scientific activity and provides guidance to the Board, the Clusters, and the Centres. Its composition reflects the diversity of areas and interests within INESC TEC. The Business Advisory Board performs a similar role in the areas of business development and industry relations, assessing the institute's performance and providing recommendations to the Board in those areas.

The Conflict of Interest Management Commission is appointed by the Board to implement the institute's Policy on Conflict of Interest. The Data Protection Officer leads the implementation across INESC TEC of the General Data Protection Regulation.

A streamlined and dynamic team of highly qualified technical and administrative personnel provides support to INESC TEC's activities. A comprehensive set of support services, presented in the table below, is organised to support the R&D Centres across the domains of Business Development, Organisation and Management, and Technical Support.

Furthermore, each research Centre has its autonomous administrative support, also with highly qualified staff.



MEMBERS OF THE BOARD

Members of the Board of Directors

José Manuel Mendonça Chairman
Bernardo Almada Lobo
Gabriel David
João Claro
José Carlos Caldeira
Luís Carneiro
Luís Seca
Manuel Ricardo
Rui Oliveira

Members of the Executive Board

João Claro CEO
Gabriel David
Luís Carneiro

BUSINESS ADVISORY BOARD

The Business Advisory Board supports the Board in business development and industrial relations issues.

Alberto Barbosa Member of the General and Advisory Board of EDP
António Murta Managing Partner - Pathena SGPS S.A.
Jorge Vasconcelos Chairman of NEWES, New Energy Solutions
João Paulo Oliveira Membre of the Administrative Board, The Navigator Company
Luís Filipe Reis CCCO Sonae, CEO Sonae Financial Services

SCIENTIFIC ADVISORY BOARD

The international Scientific Advisory Board plays a relevant role in permanently auditing the Institute's activity and counselling the Board.

Chairman
NIS **José Carlos Príncipe** University of Florida USA

II **Volker Stich Aachen** University of Technology, Germany
CS **José Luíz Fiadeiro** University of Leicester, UK
NIS **John O'Reilly** Univeristy College of London, UK
NIS **Leonardo Chiariglione** CEDEO, Italy
PE **Tomaz Goméz** Universidad Pontigicia Comillas, Spain
NIS **Faramarz Farahi** University of North Carolina at Charlotte, USA
II **Steven P. Nichols** University of Texas at Austin, USA
CS **José A.B. Fortes** University of Florida, USA
II **James C. Spohrer** IBM University Programs World-Wide, USA
NIS **Max Viergever** University Medical Center Utrecht, The Nederlands
II **Pere Ridao** Institut de Recerca en Visió Per Computador Robòtica, Spain
NIS **Bruno Siciliano** PRISMA Lab, Italy
CS **Pedro Larrañaga** Universidad Politécnica de Madrid, Spain
CS **Christian Cachin** IBM Research - Zurich, Switzerland

TECHNICAL SUPPORT SERVICES

System Administration
Jaime Dias, *Manager*
Networks and Communications Service
Gil Coutinho, *Manager*
Management Information Systems Service
José Carlos Sousa, *Manager*
Infrastructures Maintenance Service
Jorge Couto, *Manager*

BUSINESS DEVELOPMENT SERVICES

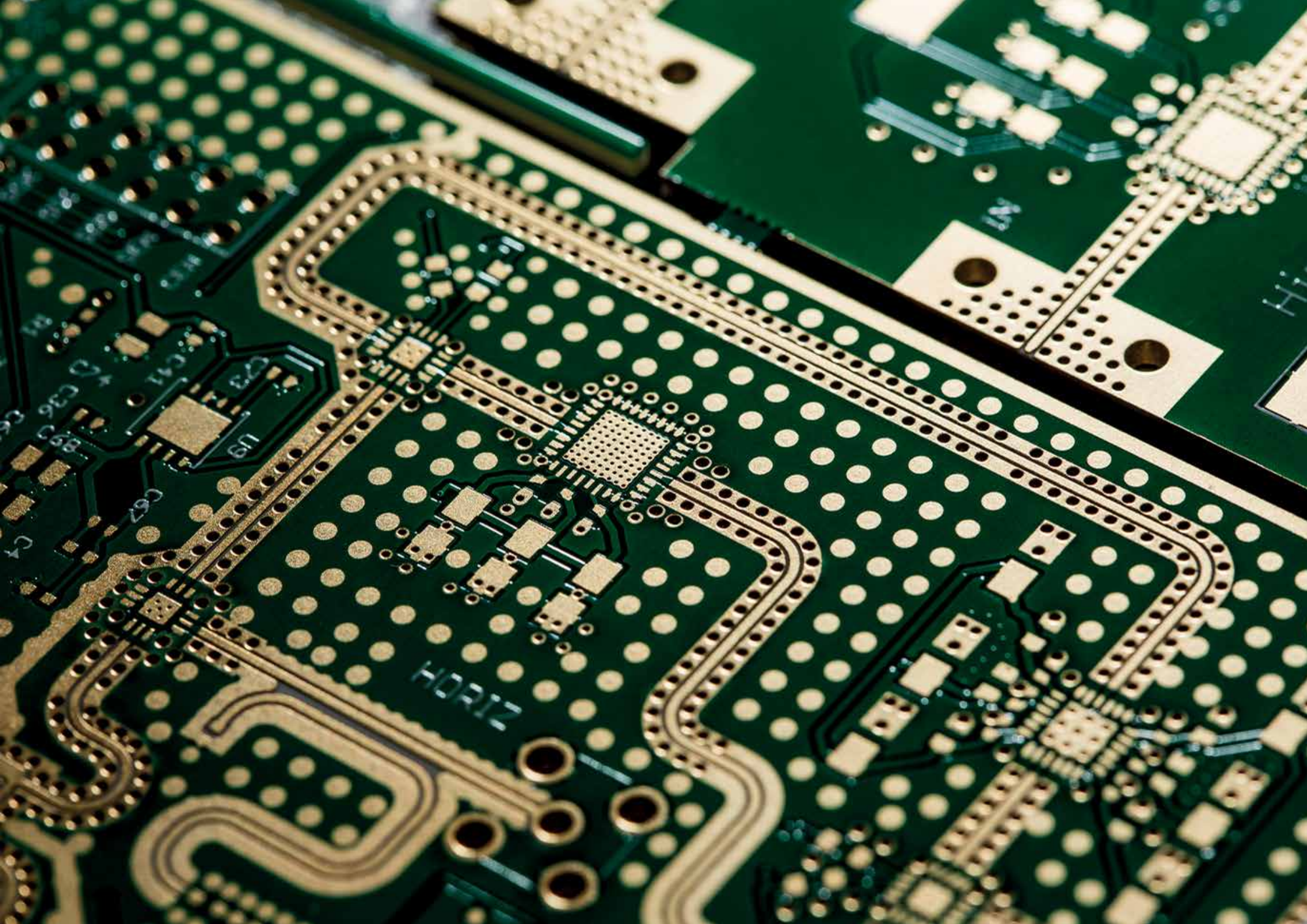
Industry Partnership Service
Augustin Olivier, *Manager*
Technology Licensing Office
Catarina Maia, *Manager*
Funding Opportunities Office
Marta Barbas, *Manager*
International Relations Office
Vladimiro Miranda, *Manager*
Communication Service
Sandra Pinto, *Manager*

ORGANISATION AND MANAGEMENT SERVICES

Legal Support
Graça Barbosa, *Manager*
Management Support
Isabel Macedo, *Manager*
Accounting and Finance
Paula Faria, *Manager*
Management Control
Marta Barbas, *Manager*
Vanda Ferreira, *Assistant Manager*
Human Resources
Graça Barbosa, *Manager*
Margarida Gonçalves, *Assistant Manager*
Secretarial Coordination
Grasiela Almeida, *Manager*

2. MANAGEMENT MODEL AND HIGHLIGHTS

CLUSTERS AND CENTRES


HORIZ

NETWORKED INTELLIGENT SYSTEMS

CLUSTER COORDINATOR: JAIME CARDOSO

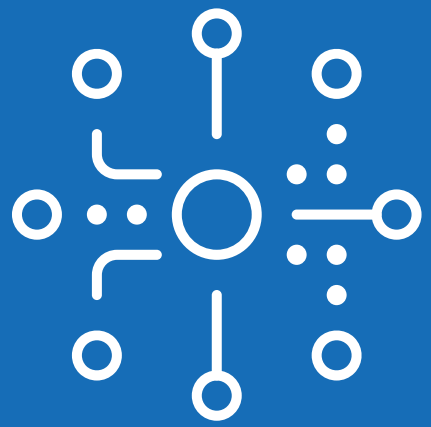
CORE CENTRES:

CTM CENTRE FOR TELECOMMUNICATIONS AND MULTIMEDIA

CAP CENTRE FOR APPLIED PHOTONICS

CRAS CENTRE FOR ROBOTICS AND AUTONOMOUS SYSTEMS

C-BER CENTRE FOR BIOMEDICAL ENGINEERING RESEARCH



CLUSTER PRESENTATION

The Cluster NIS carries out activities aligned with the following vision: "We aim to create autonomous networked intelligent hybrid systems enabled by ubiquitous sensing and processing of information".

These systems should be able to operate also in extreme environments such as the deep sea or inside the human body. We address various problems in both fundamental theory and practical system implementation by applying statistical techniques, machine learning, and algorithmic techniques.

Our research goal is to bridge the gap between theoretical/algorithmic techniques and their practicality in real-world networked systems. Challenges addressed in NIS related with sensing, communication, interpretation and action are strongly multidisciplinary and necessary for systems reacting to the environment. Participation of multiple and disparate disciplines will enable NIS to be distinctive and impactful.

STRATEGIC AREAS

- Sensing technologies
- Electronics
- Robots and Autonomous Systems
- Signal processing techniques
- Machine learning and pattern recognition techniques
- Communications

CENTRES OF THE CLUSTER

CTM
CENTRE FOR TELECOMMUNICATIONS AND MULTIMEDIA

Centre Coordinators: Jaime Cardoso and Filipe Ribeiro

CTM addresses scientific and technologic topics related to the fields of telecommunications and multimedia. CTM is fully committed and aligned with the vision and mission of INESC TEC, by directing its activities towards four main areas of research: Optical and Electronic Technologies; Wireless Networks; Multimedia and Communications Technologies; Information Processing and Pattern Recognition.

CAP
CENTRE FOR APPLIED PHOTONICS

Centre Coordinators: Paulo Marques and Ireneu Dias

CAP accomplishes its mission by directing its activities towards three main areas of research: optical sensors; integrated optics and microfabrication; advanced optical imaging. In this arrangement, optical sensors comprise Chemical/Biosensors and Physical sensors. This organisation is non-hermetic and the development of solutions implies multidisciplinarity and cooperative work from the different fields of the available expertise.

CRAS
CENTRE FOR ROBOTICS AND AUTONOMOUS SYSTEMS

Centre Coordinators: Eduardo Silva, Aníbal Matos and Carlos Pinho

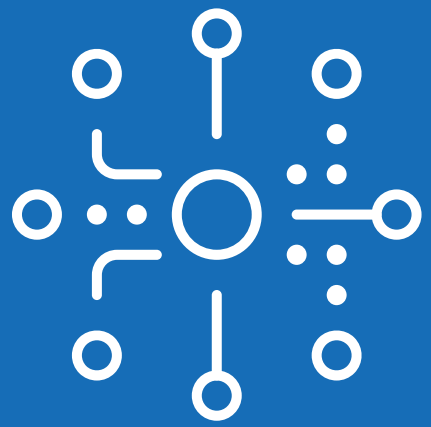
CRAS addresses scientific and technological topics associated to field robotics and autonomous systems. CRAS aims at becoming a worldwide reference in field robotics and autonomous systems and is already internationally recognised for its innovative robotics solutions for operation in complex environments – relevant examples are underwater environments, and particularly deep-sea water.

C-BER
CENTRE FOR BIOMEDICAL ENGINEERING RESEARCH

Centre Coordinators: Aurélio Campilho and João Paulo Cunha

The mission of C-BER is "to promote scientific knowledge excellence through fundamental and applied research, advanced training and innovation in Biomedical Engineering". To accomplish its mission, C-BER is organised in three Labs (Biomedical Imaging Lab, BioInstrumentation Lab and NeuroEngineering Lab).

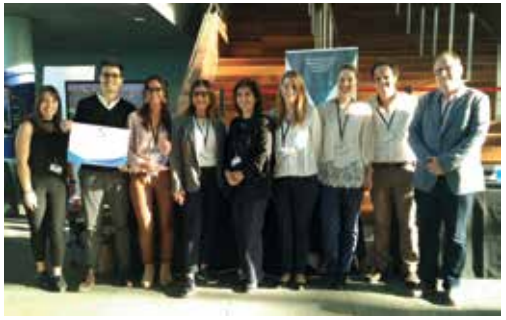
HIGHLIGHTS



EXPERTISE AND AWARDS

PROJECT WITH SOLUTION FOR OIL SPILLS IN THE SEA WINS EUROPEAN AWARD

The SpilLess project, developed in collaboration with INESC TEC's Centre for Robotics and Autonomous Systems (CRAS), won the "3rd Atlantic Project Award 2018", an award that intends to highlight works at a regional, national, or international level that are part of the European Commission's strategy for the Atlantic.



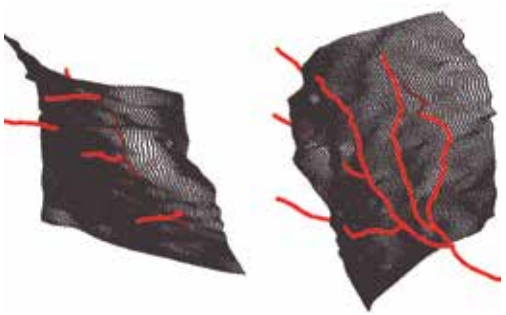
FIRST PORTUGUESE SCIENTIST-ASTRONAUT IS A RESEARCHER AT INESC TEC

In October, Ana Pires became the first Portuguese woman to obtain the scientist-astronaut diploma in the PoSSUM Scientist Astronaut Qualification Program, which was supported by NASA and taught at the Embry-riddle Aeronautical University (Florida, USA), one of the most prestigious universities in the United States.

FEATURED R&D AND CONSULTING PROJECTS

INESC TEC DEVELOPS PIONEER PROJECT TO SUPPORT BREAST RECONSTRUCTION

A joint team of INESC TEC researchers developed a software that intends to help surgeons in breast reconstructions that use DIEAP - Deep Inferior Epigastric Artery Perforator Flap. Ricardo Araújo, Hélder Oliveira and Daniel Vasconcelos are the researchers involved in this partnership with Champalimaud Foundation.



INESC TEC IS AN ASSOCIATE IN MOBILIZING PROGRAMME 5G

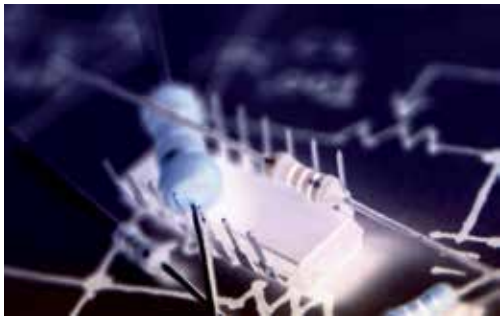
INESC TEC is part of the consortium of the Project "Mobilizador 5G – Components and Services to 5G networks", led by Altice Labs. Through new technological developments regarding 5G networks, this project intends to create new products and services and to promote 5G technologies and its introduction in Portugal.

INESC TEC REACHES THE INTERNATIONAL COMPETITION FINAL TO EXPLORE THE DEEP SEA

An INESC TEC research team advanced to the final round of the Shell Ocean Discovery XPrize's international competition. The team aimed to develop technologies in order to collect data and to map the deep sea in difficult access areas that are yet to be explored. The project was awarded €90 000 ($111 000).

NEW PROJECT TO MANAGE RESOURCES AT INDOOR LOCATION

To create models for assets, equipments and enterprises internal management is the main purpose of WHERE.IS project, developed by INESC TEC. This new technology will contribute to the development of new paradigms about asset management, equipments and diverse nature of organisation process dominant models.



INESC TEC OBTAINS THE FIRST PATENTS AS SOLE OWNER IN THE US AND SOUTH KOREA

The C4MiR technology - Control Module for Multiple Mixed-signal Resources Management result in the first patent family whose applications were granted in USA and South Korea. This patent family, of which INESC TEC is the sole patent holder, includes patent applications under analysis in Europe, China and Japan.

PROJECT RELATED TO SAFETY AND BORDER CONTROL AREAS CAME TO AN END

After four and half years, the SUNNY project has ended. Sixteen international entities, including INESC TEC, developed a smart sensors network that can be carried on-board of unmanned aircraft. The role of the aircraft is to monitor the border areas.

FOTOINMOTION INTENDS TO CREATE IMMERSIVE MULTIMEDIA STORIES

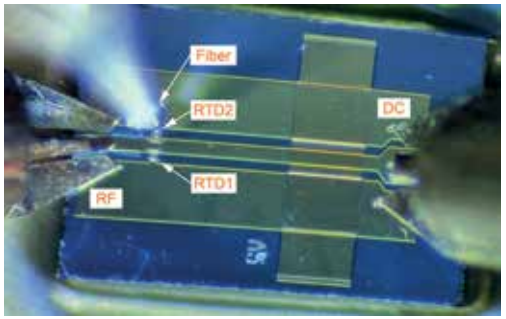
The goal of this new European project called FotoInMotion, which is promoted by INESC TEC's Centre for Telecommunications and Multimedia (CTM), is to develop an innovative solution for the reutilisation of audiovisual content, allowing content creators to build multimedia stories in a simple way.

TECHNOLOGY FOR CERVICAL CANCER SCREENING HAS INESC TEC'S CONTRIBUTION

The goal of project CLARE, developed by INESC TEC'S Centre for Telecommunications and Multimedia (CTM), in collaboration with Fraunhofer Portugal-AICOS, is to prevent cervical cancer through an effective technology that can be used as a Decision Support System, capable of providing explanations to experts with less costs.

SCREENING OF ANTIBIOTIC CONTAMINATION BY MOBILE DEVICES

The researchers from INESC TEC's Centre for Telecommunications and Multimedia (CTM) started the project S-MODE, that seeks to find low-cost techniques for in-situ analysis of the antibiotic contamination in waters, aiming at the rapid diagnosis and immediate intervention.



THE PROJECT THAT TESTED A 10 TIMES FASTER WIRELESS SPEED HAS COME TO AN END

The European project iBROW, which had the participation of INESC TEC's Centre for Telecommunications and Multimedia (CTM), has ended. With the collaboration of 11 international partners and EUR 4 million funded by the European Commission, transmission speeds that achieved 10 Gbps, when the normal is 1 Gbps.

ROBOTS FOR UNDERWATER EXPLORATION TESTED IN SLOVENIA AND IRELAND

A team composed of Alfredo Martins, José Almeida, Carlos Almeida, Ricardo Pereira and Eduardo Soares from INESC TEC's Centre for Robotics and Autonomous Systems (CRAS) was at the mercury mine in Idrija, Slovenia, between 11 and 21 September in order to carry out the second field trials of the UNEXMIN robot.

UNDERWATER MINING IS ALREADY POSSIBLE AND HAS SIGNATURE OF INESC TEC

Ore mining in abandoned and flooded mines is possible due to the development of a robotic system, under the VAMOS project, which is mainly composed by a 25 tonnes underwater mining vehicle, an autonomous inspection submersible and a barge to support the operation.

INTERNET FOR SHIPS IN HIGH SEAS IS ALREADY POSSIBLE AND HAS SIGNATURE OF INESC TEC

Broadband and low cost wireless communications for ships. This was the major outcome achieved by the MareCom project, which had the participation of INESC TEC, Wavecom, Portuguese Navy Research Center and Ubiwhere.

UNDERWATER ROBOTICS MINING PROJECT IN TESTS IN IRELAND

INESC TEC participates in the iVAMOS! Project, which has a budget of EUR 12.6 million, and aims to mining flooded landmines. A team of the Centre for Robotics and Autonomous Systems (CRAS) carried out tests with the positioning, navigation and "awareness" systems, which were developed by INESC TEC.

EVENTS AND VISITS

OPEN DAY CTM DEDICATED TO ARTIFICIAL INTELLIGENCE

On 11 May took place the 7th edition of the Open Day of INESC TEC's Centre for Telecommunications and Multimedia (CTM) at the Faculty of Engineering of the University of Porto (FEUP). This year's edition was dedicated to Artificial Intelligence in the context of Telecommunications and Multimedia.

POWER AND ENERGY

CLUSTER COORDINATOR: MANUEL MATOS

CORE CENTRE:

CENTRE FOR POWER AND ENERGY SYSTEMS (CPES)

ASSOCIATED CENTRES:

CEGI CENTRE FOR INDUSTRIAL ENGINEERING AND MANAGEMENT

CTM CENTRE FOR TELECOMMUNICATIONS AND MULTIMEDIA

CESE CENTRE FOR ENTERPRISE SYSTEMS ENGINEERING

LIAAD LABORATORY OF ARTIFICIAL INTELLIGENCE AND DECISION SUPPORT

CRAS CENTRE FOR ROBOTICS AND AUTONOMOUS SYSTEMS

CSIG CENTRE FOR INFORMATION SYSTEMS AND COMPUTER GRAPHICS

HASLAB HIGH-ASSURANCE SOFTWARE LABORATORY

CAP CENTRE FOR APPLIED PHOTONICS

CLUSTER PRESENTATION

The cluster is focused on traditional and emergent areas of power and energy systems, for planning and operation purposes, with an emphasis on renewable energy sources (RES) integration, electric vehicles (EV) deployment, distributed energy resources (DER) management, demand response (DR), smart grids and energy analytics, through steady-state and dynamic network analysis, reliability models and tools, optimization, soft computing and data science.

CPES is the core Centre of the Cluster, as it is clearly where the sector critical mass is concentrated, but the evolution of the energy system, particularly the electrical power system, has supported the involvement of other competences, held by associated Centres, due to the multidisciplinary nature of the problems and opportunities to address. There are already examples of this collaboration and joint projects, in the areas of information and communication technologies (CTM), data science (LIAAD), data platforms and hubs (HASLab), asset management (CEGI) and combined energy and process optimization in industry (CESE).

More than sharing projects, the goal is to foster a multidisciplinary approach to support current applied research and technology transfer, but most of all, to design the scientific strategy for this particular domain, distributed among the different Centres of the cluster, that will guarantee the creation of new knowledge to support the future challenges of a digital and decarbonized energy system.

STRATEGIC AREAS

- Co-simulation in Electrical Networks
- Multi-energy networks
- Large-scale modelling of energy systems
- Weather Intelligence Applied to Power Systems
- Predictive Maintenance and Asset Management
- Smart-grid hardware
- New marketplaces for energy services
- Cybersecurity of the grid
- System resilience
- Power system planning
- Energy efficiency

CENTRES OF THE CLUSTER

CPES
CENTRE FOR POWER AND ENERGY SYSTEMS

Centre Coordinators: Manuel Matos, Ricardo Bessa and Jorge Pereira

CPES holds specific expertise in power systems analysis (steady-state and dynamic), probabilistic and fuzzy modelling, reliability, optimisation and decision-aid, computational intelligence, energy analytics and forecasting, with special focus on large scale integration of Renewable Energy Sources (RES), Distributed Energy Resources (DER) operation, Electric Vehicles (EV) deployment and Energy and Flexibility management, under the Smart Grid paradigm.
CPES activity is organised in six areas: DMS/EMS and network automation; System planning and reliability; RES & DER integration; Electricity markets; X-energy management systems; Multi-energy networks.
This Centre is a world reference in large scale integration of RES and DER. CPES has two IEEE Fellows (one in the IEEE Distinguished Lecturer Program) and is a strong player in EU H2020 (coordinator in some projects) and contracts with national and international companies, with a robust track record in technology transfer and consulting.

HIGHLIGHTS

EXPERTISE AND AWARDS

PAPER BY INESC TEC RESEARCHERS AMONG THE MOST POPULAR IN IEEE

In the scope of the work developed at the Centre for Power and Energy (CPES) of INESC TEC, the article "Defining control strategies for MicroGrids islanded operation", available at IEEE Xplore Digital Library, published in May 2006, is still one of the most popular of this publication.

INESC TEC'S RESEARCHERS WIN IEEE COMPETITION FOR THE 3RD TIME

The researchers Leonel Carvalho and Vladimiro Miranda once again won the competition organised by the IEEE (Institute of Electrical and Electronics Engineers), the world's most prestigious and largest professional organisation dedicated to the advancement of science and technology.

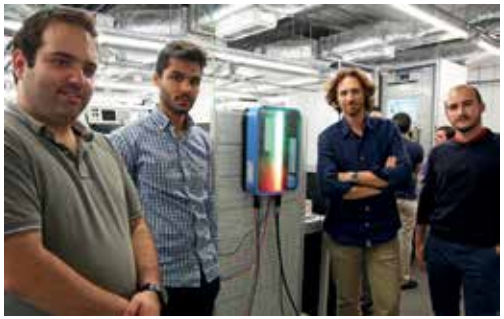
FEATURED R&D AND CONSULTING PROJECTS

PROJECT RELATED WITH SMART GRIDS ENDS WITH POSITIVE OUTCOMES

On 7 February, the H2020 SmarterEMC2 project held its final review meeting in Brussels, with the participation of all 11 project partners and the EC Project Officer who positively acknowledged the performed work and its results.

INESC TEC TESTS NEW SOLUTIONS REGARDING PROJECT SENSIBLE

Starting in 2015, project SENSIBLE, which is now close to its end, has been exploring the benefits of using energy storage technologies such as batteries, our homes, communities and even distribution grids to create a more sustainable and reliable power supply.



INESC TEC CONTRIBUTES TO ELECTRICITY INTERCONNECTIONS OF 20 COUNTRIES

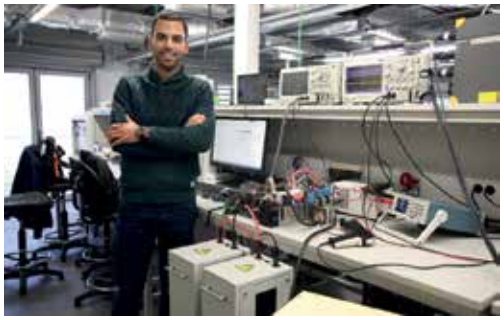
Recent studies led to the identification of transmission networks reinforcements of Southern Europe and North Africa countries. This work had inputs of researchers from INESC TEC's Centre for Power and Energy Systems (CPES) and will make the integration of 14 new electricity interconnections in HVC and HVCD possible.

EUROPEAN PROJECT LED BY INESC TEC IN THE FIELD OF ENERGY CAME TO AN END

The European project AnyPLACE, led by INESC TEC through the Centre for Power and Energy Systems (CPES), came to an end.
After three and a half years, it was developed an energy management system capable of monitoring and controlling local devices according to the preferences of the end-users.

INESC TEC HAS A TECHNOLOGY PATENTED IN USA

INESC TEC has just seen the ACDC Cube technology patented in USA. The solution, developed by INESC TEC's Centre for Power and Energy Systems (CPES), is a more compact and efficient electronic power converter. The technology can be used, for example, to charge the batteries of an electrical vehicle.



INESC TEC AND EFACEC RENEW THEIR COLLABORATION PROTOCOL FOR A FURTHER 25 YEARS

On 22 June, in the ANJE auditorium, was signed a letter of intentions between INESC TEC and EFACEC for 25 years. The signature of the document took place precisely in the year that both institutions celebrate 25 years of partnership.

INESC TEC ORGANISED AN ADVANCED TRAINING COURSE IN THE AREA OF ENERGY SYSTEMS

The Centre for Power and Energy Systems (CPES) of INESC TEC organised, under the Electric Energy Systems – University Enterprise Training Program consortium, the advanced training course "Advanced Data Analytics for Energy Systems", which took place on 3, 4 and 5 September.

THE PROJECT THAT ALLOWED TO INCREASE FLEXIBILITY OF THE POWER SYSTEM COMES TO AN END

The SMARES project, which aimed to develop a modular converter for batteries in order to increase the flexibility of the power system, has come to an end, allowing to create a solution entitled "Smart Energy-Storing Modular Technology with advanced Energy Management System for Renewable Energy Systems".

INESC TEC DEVELOPS TOOLS FOR FRENCH TRANSMISSION SYSTEM OPERATOR

The Itesla_IPST project, which aimed to stimulate the quality of the uncertainty models, developed by the French transmission system operator, has come to an end. The Centre for Power and Energy Systems (CPES) developed quality measure tools and computation methods in order to assess the advantages of such models.

EVENTS AND VISITS

UPGRID PROJECT'S FINAL EVENT WAS HELD IN MADRID

The goal was achieved: four smart grids demonstrators were set in Europe until 2017: Bilbao (Spain), Lisbon (Portugal), Åmål (Sweden) and Gdynia (Poland). Three years later, the European project UPGRID ended and the final event was held on 21 February at Iberdrola headquarters in Madrid.

INESC TEC ORGANISES TRAINING COURSE FOR THE STAFF OF REN

The Centre for Power and Energy Systems (CPES), with the support of the Centre for Industrial Engineering and Management (CEGI), organised an advanced training course on 27, 28 and 29 June and 2, 3 and 4 July for 15 staff of REN, both from Porto and Lisbon.

INDUSTRY AND INNOVATION

CLUSTER COORDINATOR: ANTÓNIO LUCAS SOARES

CORE CENTRES

CEGI CENTRE FOR INDUSTRIAL ENGINEERING AND MANAGEMENT

CESE CENTRE FOR ENTREPRISE SYSTEMS ENGINEERING

CRIIS CENTRE FOR ROBOTICS IN INDUSTRY AND INTELLIGENT SYSTEMS

CITE CENTRE FOR INNOVATION, TECHNOLOGY AND ENTREPRENEURSHIP

ASSOCIATED CENTRES:

LIAAD LABORATORY OF ARTIFICIAL INTELLIGENCE AND DECISION SUPPORT

CLUSTER PRESENTATION

The Cluster Industry and Innovation at INESC TEC aims to research and innovate in systems and services applied to the management of value streams, from the individual organisation to networks and chains. The activities of the Cluster result in high impact systems for decision support, operations automation, management and intelligence and in the provision of innovation management & technology transfer consultancy services in Industry, Retail, Healthcare, Energy, Mobility and Transports, Agriculture and Forestry.

The Cluster wants to position INESC TEC internationally as a leading research Centre in industry and innovation and as a first choice for supporting organisations to achieve high-levels of sustainable innovation and performance.

The cluster uses a range of research approaches to fulfil its mission, namely: Systems Design, Modelling, Mathematical Programming, Optimization, Simulation, Analytics, Information Management, Data Mining, Knowledge Discovery, Machine Learning, Model Based Predictive Control, 3D and Active Perception, Multimodal Sensor Fusion, Design Science and Explanatory Research, Creative Thinking and Problem Structuring.

STRATEGIC AREAS

- Responsive, sustainable and resilient operations
- Decision support for a digitised industry
- Operational and strategic architectures for a data-driven industry
- Technology adoption, management and policy for an inclusive industry
- Mobility for the Circular Economy

CENTRES OF THE CLUSTER

CEGI
CENTRE FOR INDUSTRIAL ENGINEERING AND MANAGEMENT

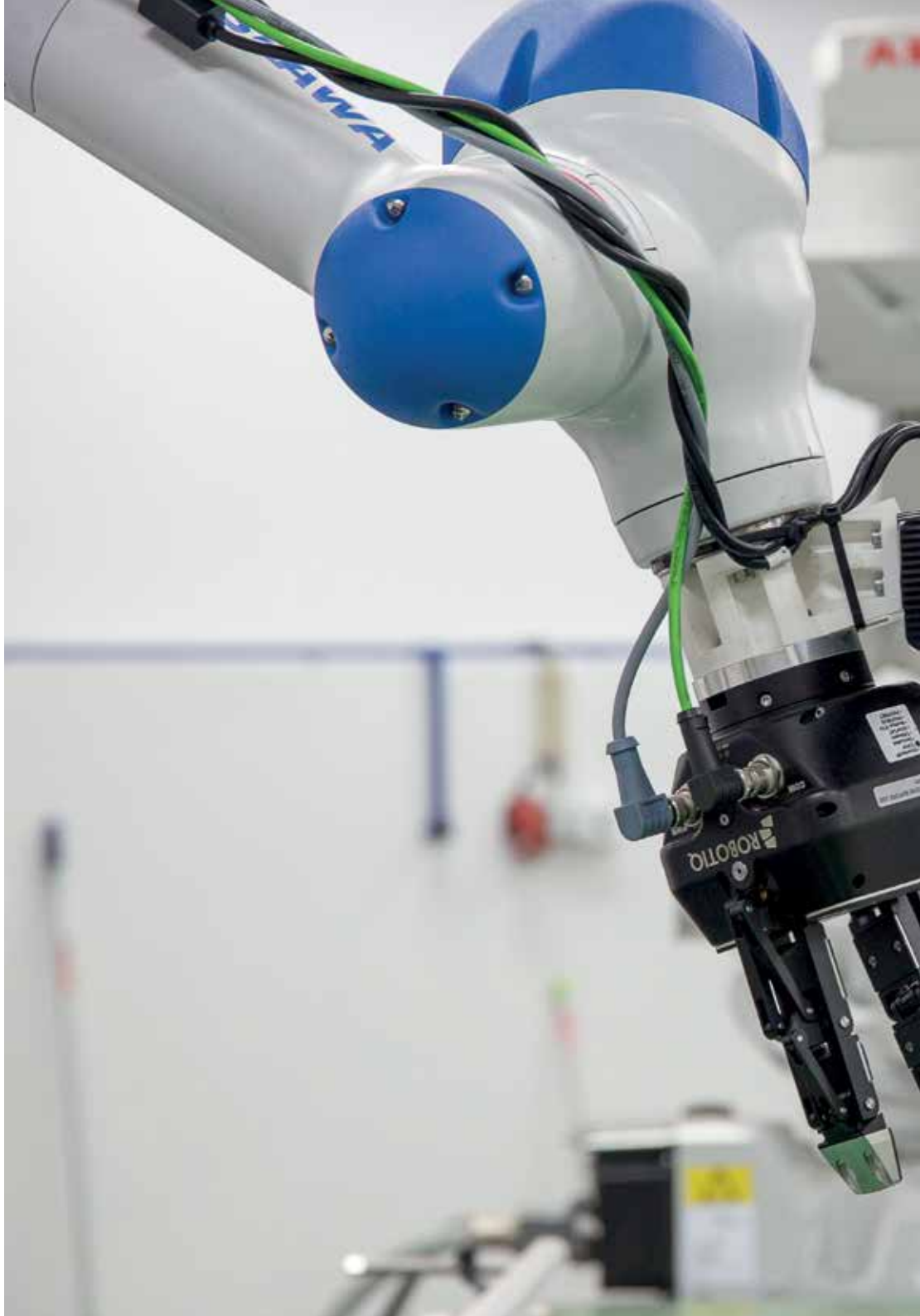
Centre Coordinators: Ana Viana and Pedro Amorim

CEGI is an international reference in business analytics through decision support systems for service and operations management, contributing also in service design, performance assessment and asset management. Prescriptive analytics is at the core of CEGI, having several researchers acting as editors of international journals, the coordination of three EURO Working Groups in the fields of Retail Operations, Production Planning and Cutting Problems, and the vice-chairing of a COST Action line.

CESE
CENTRE FOR ENTERPRISE SYSTEMS ENGINEERING

Centre Coordinators: Américo Azevedo and António Lucas Soares

CESE mission is to advance the scientific knowledge in enterprise systems engineering, providing unique expertise targeting complex industrial organisation challenges that foster high impact management and ICT systems and generate innovative services for industrial organisations. CESE wants to be positioned as a leading research Centre focused on connected, sustainable and customizable production systems through the engineering of innovative enterprise systems.



CRIIS
CENTRE FOR ROBOTICS IN INDUSTRY AND INTELLIGENT SYSTEMS

Centre Coordinator: António Paulo Moreira

The three challenges that drive CRIIS R&D are: bring industries (4.0) to the developed countries and upgrade existing industry towards 4.0 concept; manage resources in efficient way and produce more in a sustainable way; and automate processes to make elderly people more active and increase development. Robotics has the potential to transform lives and work practices, raise efficiency and safety levels, provide enhanced levels of service and create jobs.

CITE
CENTRE FOR INNOVATION, TECHNOLOGY AND ENTREPRENEURSHIP

Centre Coordinator: Alexandra Xavier

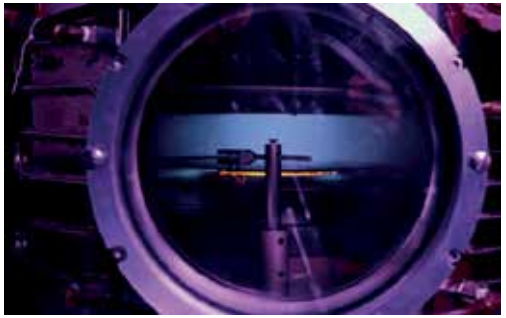
CITE accomplishes its mission by carrying out R&D, advanced consulting and executive education in Innovation & Technology Management and Technology Entrepreneurship fostering a cross-cutting approach to all INESC TEC's Clusters, and for Private and Public organisations.

HIGHLIGHTS

EXPERTISE AND AWARDS

INTERFACE PROGRAMME: INESC TEC ACKNOWLEDGED AS TECHNOLOGICAL INTERFACE CENTRE

To celebrate the first anniversary of Interface Programme, it was announced a funding on a multiannual basis for the Technological Interface Centre and INESC TEC was acknowledged as a Technological Interface Centre, in a ceremony that took place on 23 February at the Institute for Welding and Quality.



FORMER RESEARCHER OF INESC TEC WAS AWARDED THE BEST DOCTORAL DISSERTATION IN EUROPE

Margarida Carvalho, former researcher of the Centre for Industrial Engineering and Management (CEGI), is the first Portuguese woman to be awarded the EURO Doctoral Dissertation Award, a distinction that recognizes outstanding doctoral dissertations in the operational research field.

FEATURED R&D AND CONSULTING PROJECTS

INESC TEC PROMOTES COLLABORATIVE LABORATORY FOR FOREST AND FIRE

The CoLAB - Collaborative Laboratory for Integrated Forest & Fire Wise Management – ForestWISE, whose application was led by INESC TEC, was approved on the 30 January by the Foundation for Science and Technology.

NEW EUROPEAN PROJECT ABOUT BUSINESS ECOSYSTEMS BEGINS

MANUfacturing ecoSystem of QUAlified Resources Exchange (Manu-Square) is a project operated by INESC TEC's Centre for Enterprise Systems Engineering (CESE) that aims to create a European ecosystem supported by a platform that operates in a virtual market that mobilizes (extra) production capacity available.

ATM PROJECT IMPROVES OPERATIONS PLANNING AT JASIL COMPANY

The project "Advanced Tools Management", developed by the Centre for Enterprise Systems Engineering (CESE) and the Centre for Robotics in Industry and Intelligent Systems (CRIIS) of INESC TEC, and implemented at JASIL company, created a system that allows, amongst other things, to plan operations automatically.

INESC TEC'S REPORT SHOWS THAT SPECIALIZED NURSING CARE IS AN INVESTMENT WITH RETURNS

The report on specialized nursing care, written by INESC TEC for the Portuguese nurse's association, concludes that the nursing specialization is a growing need and an international trend, presuming an important financial return for the Portuguese National Health Service.

INESC TEC PARTICIPATES IN NEW EUROPEAN PROJECT ASSOCIATED WITH DIGITAL SKILLS

DIVA, the new European project with INESC TEC's cooperation, aims to implement the use of digital technologies in agriculture, agrofood, forestry and environment sectors. It was one of the four projects approved in more than 80 submitted applications. The kickoff meeting took place on 12 April in Brussels.

INESC TEC ENDS EUROPEAN PROJECT ON INDUSTRIAL PREDICTIVE MAINTENANCE

INESC TEC's Centre for Enterprise Systems Engineering (CESE) ended the MANTIS: Cyber Physical System based Proactive Collaborative Maintenance project. The goal was to develop and test a predictive maintenance platform that includes several areas such as industrial machines, vehicles and renewable energies.

INESC TEC DEVELOPS PROJECT TO IMPROVE THE AIRPORT MANAGEMENT

The major worldwide airports face a great challenge, consisting in the demand for an economic solution that solves its traffic problems. The new project entitled ASAP - Airport Slot Allocation Processes, in which INESC TEC's Centre for Industrial Engineering and Management (CEGI) participates, intends to address that challenge.

INESC TEC'S NEW PROJECT DEVELOPS INTELLIGENT LOGISTICS SYSTEMS

Tec-FEL - Logistics 4.0: Technologies for flexible and eco-efficient logistics is the name of the new project led by INESC TEC with the work of the Centre for Enterprise Systems Engineering (CESE). The goal is to develop intelligent logistics systems that aim at improving the sustainability of supply chains in the circular economy.

INESC TEC IS PART OF EIT MANUFACTURING

INESC TEC is a Core partner of the EIT Manufacturing consortium. "Leading Manufacturing innovation is Made By Europe" is the name of the winning project of the competition for a Knowledge Innovation Community in the manufacturing industry field that was launched by the European Institute of Innovation and Technology.

PROJECT TO DEMONSTRATE INDUSTRY 4.0 TECHNOLOGIES IN EUROPEAN SMES WAS COMPLETED

The closing meeting of the BEinCPPS project – Business Experiments in Cyber-Physical Production Systems was held in Brussels on 12 December. It aimed at promoting the implementation of cyber-physical production systems in Small and Medium-Sized enterprises (SME).

EVENTS AND VISITS

FOOTWEAR CLUSTER ROADMAP FOR THE DIGITAL ECONOMY

INESC TEC was a key partner in the development of the Roadmap for the Digital Economy of the Portuguese Footwear Cluster, promoted by the Portuguese Footwear, Components, Leather Goods Manufacturers' Association (APICCAPS). The official presentation was held at the Portuguese Footwear Technological Centre.

INESC TEC WAS ONCE AGAIN PRESENT AT HANNOVER MESSE

INESC TEC was once again present at Hannover Messe, the world's leading trade show for the manufacturing industry, represented by the Centre for Enterprise Systems Engineering (CESE) under the BEinCPPS – Business Experiments in Cyber Physical Production Systems project.

COMPUTER SCIENCE

CLUSTER COORDINATOR: ANTÓNIO GASPAR

CORE CENTRES:

CSIG CENTRE FOR INFORMATION SYSTEMS AND COMPUTER GRAPHICS

HASLAB HIGH-ASSURANCE SOFTWARE LABORATORY

LIAAD LABORATORY OF ARTIFICIAL INTELLIGENCE AND DECISION SUPPORT

CRACS CENTRE FOR RESEARCH IN ADVANCED COMPUTING SYSTEMS

CLUSTER PRESENTATION

The mission of the Computer Science Cluster is to achieve international excellence in both fundamental and applied research, with strong emphasis and impact on technology innovation and transfer that benefits society at large.

Our commitment encompasses many core areas from programming languages and rigorous software development to complex information systems, from data processing to large scale computing, from embedded systems to virtual environments, and from security to quantum computing, with the goal of bringing better intelligence into everything.

The Cluster is also strongly involved in Technology Transfer activities, either as Advanced ICT Consulting or Innovative Systems Development, in areas such as Agriculture, Electronic Government, Energy, Healthcare, Industry, Telecommunications, Transport and Services. The Cluster is in a unique position to address many of the technological and societal challenges mentioned above, thanks to the complementary competences of its core research Centres, in areas such as advanced computing, security, privacy, big data, machine learning and immersive multisensorial human computer interfaces.

STRATEGIC AREAS

— Software engineering
— Programming languages
— Information and Database management systems
— Bigdata, Computational and Data science
— Machine learning and Model-driven decision support
— Distributed computing and systems
— Computer graphics and Virtual environments
— Cryptography, Information security and privacy
— Embedded and special purpose computing systems
— Accessibility and Assistive technologies

CENTRES OF THE CLUSTER

CSIG
CENTRE FOR INFORMATION SYSTEMS AND COMPUTER GRAPHICS

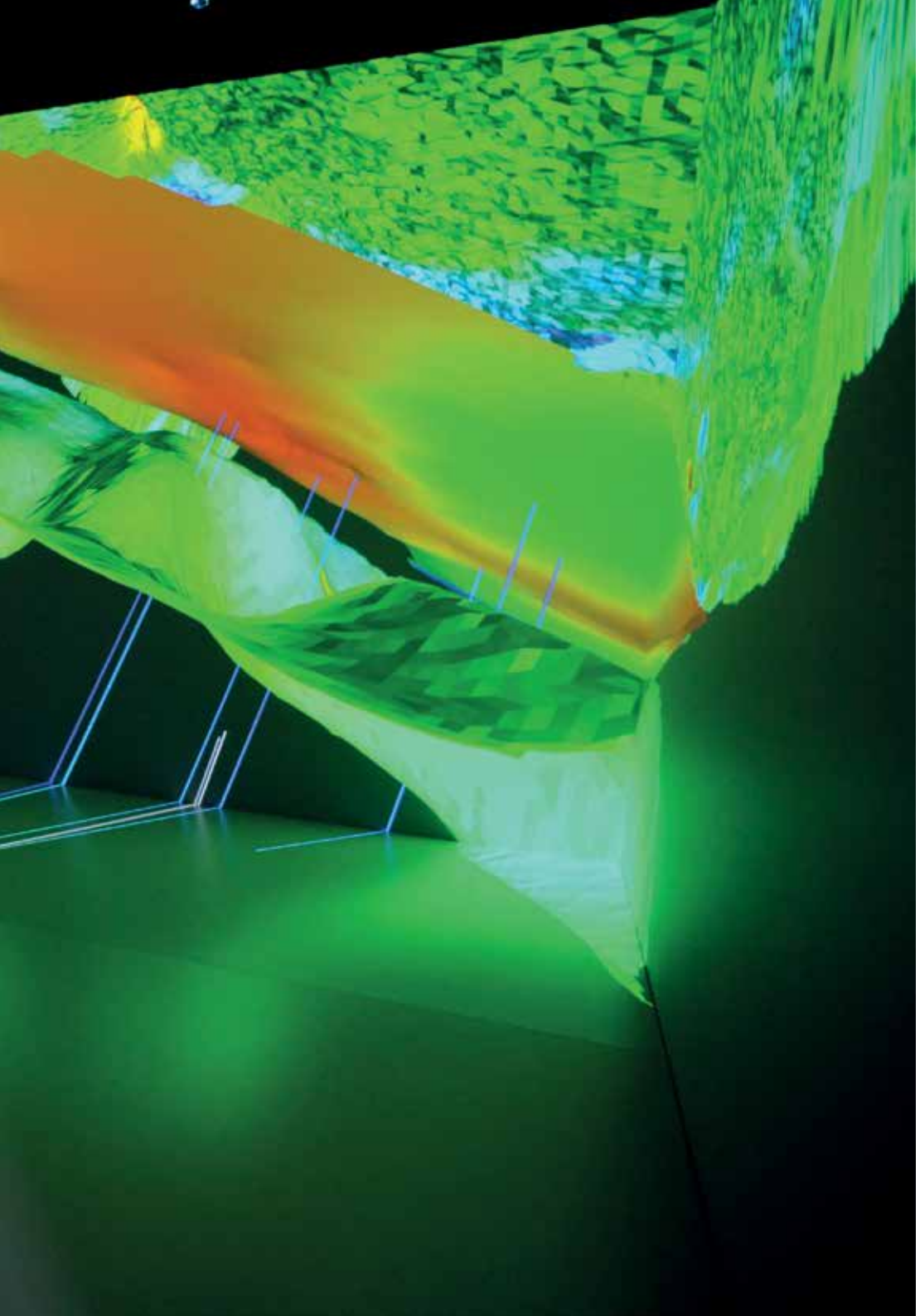
Centre Coordinators: António Gaspar and Ângelo Martins

CSIG's mission is to pursue high quality research, strongly linked to industrial partnerships, consultancy and technology transfer, in five main areas: Computer Graphics and Virtual Environments, Information Management and Information Systems, Software Engineering, Accessibility and Assistive Technologies and Embedded/Special Purpose Computing Systems.

HASLAB
HIGH-ASSURANCE SOFTWARE LABORATORY

Centre Coordinators: Alcino Cunha and Manuel Barbosa

HASLab is focused on the design and implementation of high-assurance software systems: software that is correct by design and resilient to environment faults and malicious attacks. HASLab accomplishes its mission within the Computer Science Cluster, anchoring its research on a rigorous approach to three areas of Computer Science: Software Engineering, Distributed Systems, and Cryptography and Information Security.



LIAAD
LABORATORY OF ARTIFICIAL INTELLIGENCE AND DECISION SUPPORT

Centre Coordinator: Alípio Jorge

LIAAD aims to produce high quality cutting-edge research, to be in the international forefront of our research areas and promote transfer of knowledge and technology. Our overall strategy is to take advantage of the data flood and data diversification and invest in research lines that will help shorten the gap between collected data and useful data, as well as offering diverse modelling solutions.

CRACS
CENTRE FOR RESEARCH IN ADVANCED COMPUTING SYSTEMS

Centre Coordinators: Luís Antunes and Ricardo Rocha

CRACS has the mission of pursuing scientific excellence in the areas of programming languages, parallel and distributed computing, information mining, security and privacy, with a focus on scalable software systems for challenging multidisciplinary applications in Engineering, Life Sciences, Social Networks and the Internet of Things (IoT).

HIGHLIGHTS

EXPERTISE AND AWARDS

INESC TEC'S RESEARCHER CONSIDERED THE MOST VALUABLE HACKER

André Baptista, researcher of INESC TEC's Centre for Research in Advanced Computing Systems (CRACS), was awarded the title of "The Most Valuable Hacker" at the international live hacking event H1-202, that took place on 24 and 25 March in Washington D.C.

NEWS PLATFORM AWARDED WITH EUR 10 000 HAS PORTUGUESE KNOW-HOW

The new Portuguese news aggregation platform is called "Conta-me histórias" and received EUR 10 thousand for the first place under the Arquivo.pt Prizes 2018. The award ceremony took place in the afternoon on 3 July, at the Science Summit 2018.

APP FOR FIGHTING DEPRESSION SELECTED FOR EUROPEAN HEALTH AWARDS

Moodbuster, the platform developed under the ICT4Depression, a project of INESC TEC's Centre for Information Systems and Computer Graphics (CSIG), was selected as one of the five nominees for the European Health Awards 2018.

FEATURED R&D AND CONSULTING PROJECTS

GOAL: TO REDUCE MISTAKES ASSOCIATED WITH THE USE OF MEDICAL DEVICES

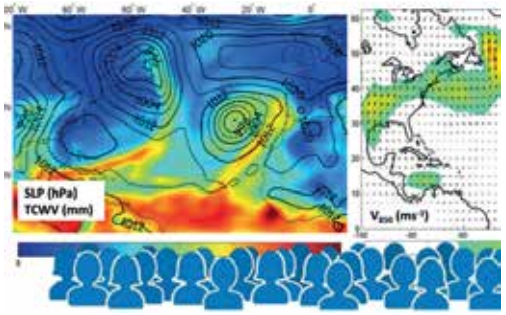
Saving lives through the reduction of mistakes in the use of medical devices. That is the purpose that moved researchers from the High-Assurance Software Laboratory (HASLab) of INESC TEC to participate in an international programme that intends to reduce the number of mistakes associated with the use of equipment.

INESC TEC DEVELOPS TOOLS TO MANAGE RESEARCH DATA

A team from the Faculty of Engineering of University of Porto (FEUP) and INESC TEC developed two instruments, named Dendro and LabTablet, to help researchers managing their data, avoiding losses and encouraging the exchange of information in international projects.

CROWDSOURCING TO INVESTIGATE EXTREME ATMOSPHERIC PHENOMENA

ECSAAP - expert Crowdsourcing for Semantic Annotation of Atmospheric Phenomena is a project led by INESC TEC, developed within the scope of informatics and integrated researched based on the context of the AIR Center, which aims to explore the application of crowdsourcing in weather research and its changes.



KLEE IS THE NEW INESC TEC RESEARCH PROJECT

The Foundation for Science and Technology (FCT) competition accepted KLEE, Coalgebraic Modelling and Analysis for Computational Synthetic Biology, as the new research project of the High-Assurance Software Laboratory (HASLab) of INESC TEC, which aims the development of coalgebraic models for synthetic biology.

NEW SOFTWARE HELPS COACHES MAKING DECISIONS

Researchers from Creativelab – CIDESD (Research Center in Sports Sciences, Health and Human Development) and INESC TEC are developing a processing and visualization software that allows to examine variables of collective tactical performances from the position of the players. This connection is called Swish.

INESC TEC PROJECT APPLIED TO CITIZEN CARD

A project of INESC TEC, developed in partnership with the Portuguese Mint and Official Printing Office, created a new biometric algorithm for fingerprints that consists of a biometric security application for identity authentication and recognition used in identification documents, already being used in the Citizen Card.

DIGITAL MEANS DEVELOPED AT INESC TEC HELP IN TREATING DEPRESSION

The "iCare4Depression" project, developed by INESC TEC's Centre for Information Systems and Computer Graphics (CSIG), in collaboration with ISMAI, is an innovative work that combines face-to-face psychotherapy with digital mobile and internet solutions in order to support the treatment of depression.

PROJECT MELOA MONITORS OCEAN CURRENTS AND MAKES ITS 1ST DEMONSTRATION

The MELOA - Multi-purpose/Multi-sensor Extra Light Oceanography Apparatus project aims to provide an effective and low-cost solution capable of monitoring surface ocean currents and their dynamic characteristics in any place of the world. The project team carried out his first Portuguese demonstration.

EUROPEAN PROJECT FUNDED WITH 3 MILLION EUROS ENDED WITH EXCELLENT ASSESSMENT

On 27 September, took place the third and final assessment by the European Commission of the SafeCloud project, led by INESC TEC's High-Assurance Software Laboratory (HASLab). With an investment of over three million euros, the project focused on the area of cloud infrastructures.

INESC TEC HELPS METRO DO PORTO CONTROLLING FAILURES

INESC TEC proposed project FailStopper - Early failure detection of public transport vehicles in operational context, in partnership with Metro do Porto. The aim is to develop a model, through the installation of sensors in a vehicle, in order to inform the maintenance team about the existence of an emerging failure.

INESC TEC WANTS TO DIGITISE THE LARGEST DOCUMENTAL COLLECTION OF PORTUGAL

Integrate the largest collection of sources for the History of Portugal in the digital world. This is the main goal of the new INESC TEC's project entitled EPISA—Entity and Property Inference for Semantic Archives, which will start in January 2019.
Credits Photo: ANTT

EXPLORATORY PROJECT WITH OUTSYSTEMS CAME TO AN END

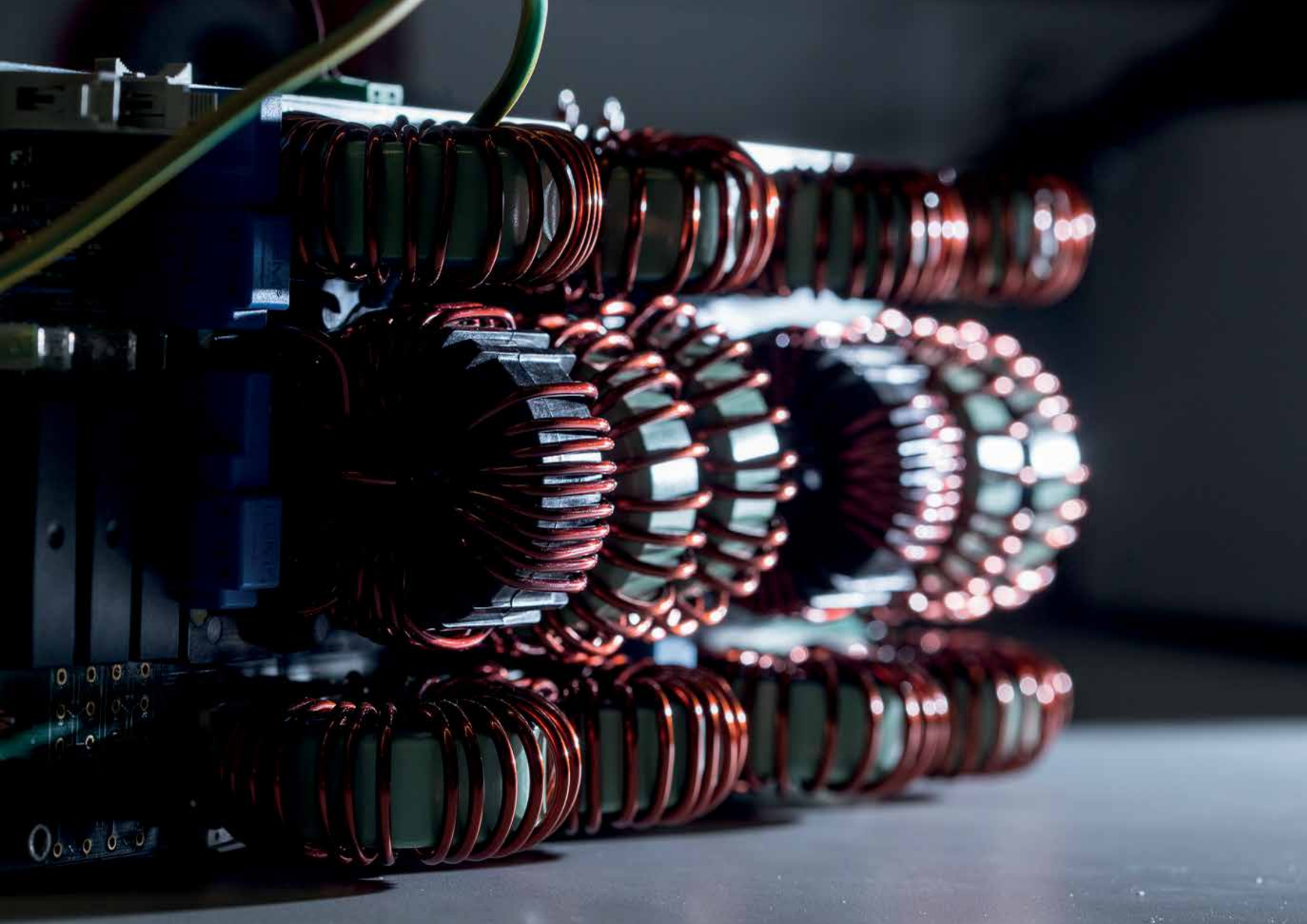
The project "Outsystems Learnability Model", which started in May 2018 and lasted for six months, aimed at defining a strategy to analyse the experience of using the OutSystems platform, in order to support its improvement.

EVENTS AND VISITS

INESC TEC HOSTS ONE OF THE LARGEST CONFERENCES ON COMPUTER SYSTEMS

The EuroSys - European Conference on Computer Systems, one of the world's largest conferences on computer systems, took place in Porto between 23 and 26 April. Around 300 participants from all over the world attended this conference.

2. MANAGEMENT MODEL AND HIGHLIGHTS



THE TEC4

A TEC4 (“TEChnologies FOR ...”) aims at structuring the market-pull innovation process, as opposed to the science-push that occurs naturally in the Research Centres. This supports the establishment of the adequate balance between the two opposing motivations and supports the full knowledge-to-value chain.

Each TEC4 targets a specific sector and induces cross-cluster multidisciplinary projects, promoting collaboration with industry and the research and technological development of solutions to be transferred to companies. The TEC4 innovation areas address regional, national and global societal challenges by mapping the short, medium and long term innovation area needs with INESC TEC scientific roadmaps.
Each TEC4 is pushed by an Agent (contracted, linked to SAPE), working in close contact with a Champion/s (Senior Researcher/s linked to a Cluster). The performance of each TEC4 is measured by the volume of direct contracts with the industry and the number of inter-Centre and inter-Cluster projects motivated.

TEC4 **SEA**

TEC4 **MEDIA**

TEC4 **AGRO-FOOD**

TEC4 **INDUSTRY**

TEC4 **ENERGY**

TEC4 **HEALTH**

TEC4
SEA

Bringing the digital world to a sustainable sea economy.

The mission of TEC4SEA is to induce a market pull drive into R&D activities targeting sea and deep-sea challenges towards a sustainable Sea Economy.
TEC4SEA is the INESC TEC innovation area that brings together R&D Institutions, businesses and associations, increasing synergies and critical mass to address real world challenges related with the Sea Economy.
TEC4SEA monitors results in the range TRL 1-9 and focuses on applied research leading to products, processes and services (TRL 5-9) that can be transferred to companies.
The multidisciplinary application-oriented solutions addressed by TEC4SEA cover a wide range of both established and emerging industries.

PROMOTION AND DISSEMINATION

BUSINESS2SEA

A set of results of the TEC4SEA innovation area were presented to national and international entities. INESC TEC also had a relevant participation in this event, promoting several seminars and workshops.

OCEANS MEETINGS

The results of the TEC4SEA innovation area were exhibited to national and international entities that were present in this international event. The main focuses of the event were the debate and networking regarding sustainable solutions for the ocean.

VIDA ECONÓMICA

In partnership with the Publishing Group Vida Económica, INESC TEC organised the conference "O Cluster do Mar" held at the Aveiro Exhibition Park. INESC TEC also presented the relevant technological trends for the Sea Economy and how INESC TEC is addressing them.

REP2018

INESC TEC participated in the 2018 Rapid Environmental Picture (REP), organised by the Portuguese Navy in order to test, evaluate and validate unmanned autonomous vehicles working in cooperation.

RELEVANT ACTIVITIES

"PORTO DE PESCA SUSTENTÁVEL"

The consulting activities to be developed by INESC TEC for Docapesca aim at defining the transformation process of the fishing ports to become sustainable in terms of the environmental and social perspectives. The integrated intervention includes water consumption, waste produced/collected, energy consumed/produced as well as the communities and the stakeholders of the port.

MODULMAR

This project, which was developed with a strategic partner, supports INESC TEC's goals of developing technologies for the Deep Sea (up to 4km of depth). The goals of the project include the development of a modular system and several components to facilitate the customisation of autonomous platforms for the Deep Sea.

STRONGMAR

This project, led by INESC TEC, had its final workshop at the end of 2018. Supported by the experience and the best practices of partners such as the University of Aberdeen, Universitat de Girona and CMRE, the project successfully achieved the expected impacts of strengthening the cooperation with these recognised institutions, increased the R&DI capacity of INESC TEC whilst extending the innovation potential of the northern region of Portugal, among others.

CORAL

INESC TEC, in partnership with CIIMAR, successfully completed the results of this project and publicly presented them. A video with the project results was also created.
The aim of the project was to investigate and to develop technology-driven solutions to tackle deep sea resource exploitation under a sustainable environmental framework, in addition to developing a sensor-based technology for marine or marine-related activities.

STRATEGIC INITIATIVES

TEC4SEA INFRASTRUCTURE

INESC TEC pursued its ambition to set up an infrastructure dedicated to support research, to develop and to test marine robotics, telecommunications, and sensing technologies for monitoring and operating in the ocean environment. The investments in this infrastructure continued throughout 2018.

IN THE BLACK

«In the Black - Deep Sea Mining Challenges» was the name of the workshop organised by INESC TEC for the second consecutive year. This workshop had several worldwide relevant entities involved in mining exploration at sea. The explorations ranged from pilot ones to commercial (diamond) ones.

OCEANS 2018

INESC TEC had a significant attendance in OCEANS 2018, which was held in Kobe (Japan) and Charleston (USA), preparing the researchers in advance for OCEANS 2021, which will be co-organised by INESC TEC and taking place in Porto.

EMRA 2018

For the fourth consecutive time, INESC TEC has been invited for the prestigious, invite-only, Workshop on EU-funded Marine Robotics and Applications (EMRA), which has been held at Limerick, Ireland. INESC TEC presented several ongoing projects related to aquatic robotics.

TEC4 MEDIA

Digital media technologies to improve the content value chain and user experience.

The mission of TEC4MEDIA is to improve the content value chain in cultural organisations, creative industries and digital media communities with digital technologies and solutions centred in user experience.
TEC4MEDIA monitors results in the range TRL 1-9, focuses on applied research leading to products, processes and services (TRL 5-9) that can be transferred to: technological companies (multimedia, software, video games, streaming, content storage, digital marketing, digitalization); content producers (educational content producers, editors, audiovisual, film, digital arts, advertising); distributers (on-line media, traditional media, social media, broadcasters, libraries, cultural archives, entertainment, telecoms, museums and cultural organisations).
TEC4MEDIA, covering all the value chain actors and processes, is strongly committed to bringing unique knowledge and technologies to solve challenges and provide technologies and solutions in the cultural, creative industries and digital media sectors.

PROMOTION AND DISSEMINATION

SYNCTALKS IN EXPOSYNK CONFERENCE

Within this international conference, several debates were held such as: Technology, Workflows and "mindsets" of "Mobile Journalism"; monetisation of online content; data protection and press freedom; 360º audio in augmented reality, to name the most relevant activities to TEC4MEDIA.

SUNSET HACKATON ROADSHOW

INESC TEC hosted once again the SUNSET HACKATON roadshow, presenting an opportunity for the whole research community to participate in a 72-hour technological marathon in an open innovation context. The participants were presented with challenging problems proposed by the companies within the media sector.

WORKSHOP - CINEMA & AUDIOVISUAL

As a member and office of NEM Portugal, INESC TEC organised several thematic workshops, specially focusing on the workshop dedicated to the Cinema and Audiovisual subsectors. These workshops took place in an iconic room at Cinemateca. Several speakers such as David Pontes (Global Media Group); Elsa Mendes (Portuguese National Reading Plan); Susana Gato (APIT); Luís Ismael (Lightbox); Alcides Vieira (SIC) and Mário Augusto (RTP) discussed the important challenges of this sector. It was also a moment to vote for the new board of NEM Portugal.

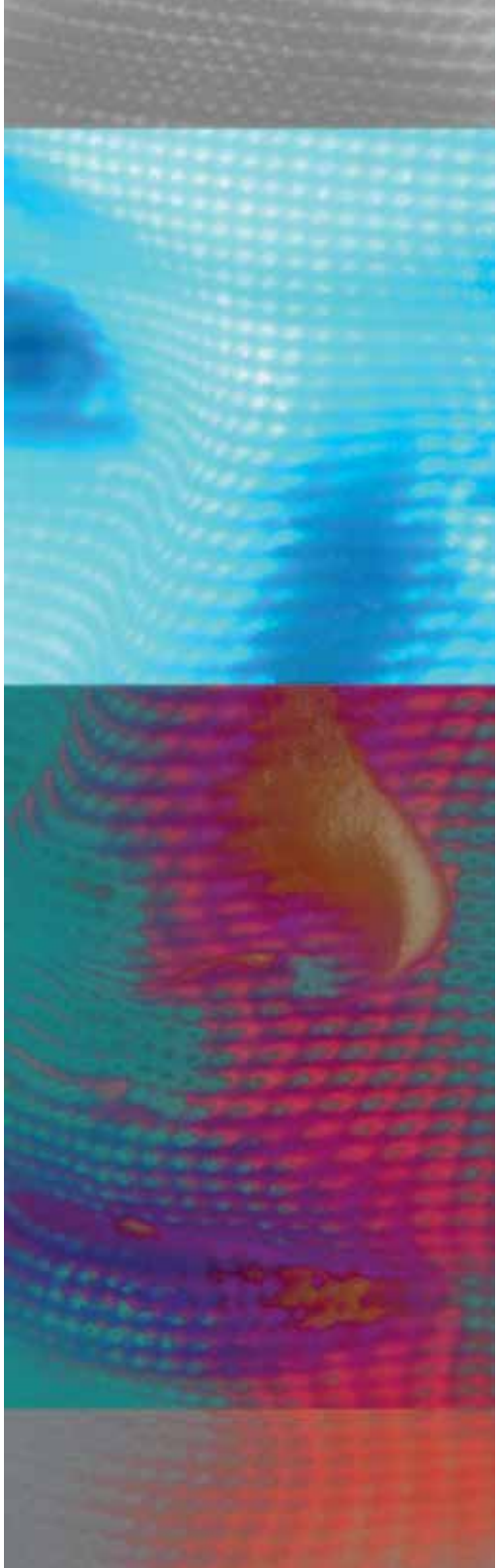
RELEVANT ACTIVITIES

NEW MUSEUM OF PORTO HISTORY

INESC TEC is the technological and multimedia partner in the new Museum of History of the city of Porto. A EUR 73, 590 contract will allow the development and the implementation (alongside the technology partner, GEMA Digital) of five innovative solutions in order to present several historical topics and episodes using augmented and virtual reality competences, interactive 3D content, and procedural generation.

FOTO IN MOTION

This H2020 project, which is promoted by INESC TEC's Centre for Telecommunications and Multimedia (CTM), focuses on reusing and enriching images for immersive video storytelling.The project will allow content creators to build multimedia stories in a simple way, by developing automatic tools for context identification, recognition of objects and people with visual information and creation of semantic descriptions, whether from an original photo or from visual content available online.
This project includes at least three areas of application: photojournalism, fashion and festivals.



CLOUD SETUP

This project developed tools for post-production of high quality audiovisual content for the television industry that allow the automation in inserting and/or replacing content in TV programming and that can work both inside a radio broadcast station as well as in a cloud-based environment. The results of this project are extremely important for the television and audiovisual content industries as it allows a cost-effective automation of processes. It proved to facilitate and speed up the content formatting that must be displayed in multiple distribution platforms.

STRATEGIC INITIATIVES

PROJECT CHIC

INESC TEC is a member of the Cooperative Holistic view on Internet and Content (CHIC), a project that was approved for funding the call "Mobilizers programs", supported by Portugal 2020 fund. With an approved budget of nearly EUR 10 million, CHIC was submitted by a consortium of 24 entities headed by MOG Technologies, S.A. The consortium incorporates different entities, ranging from SME to medium/large companies, and from institutions to the Portuguese Scientific and Technological System. The CHIC project aims to develop, test and demonstrate a wide range of new processes, products and services that have a significant impact on the audiovisual and multimedia sectors. By their nature, these projects will have a clear mobilising effect on other important sectors of the culture such as the cultural heritage, archives, books and publications or the performing arts. This project already delivered its second technical and scientific report and started to disseminate the results.

NEM PORTUGAL

INESC TEC organised all the workshops and brokerage activities within NEM Portugal. In 2018, four events were held and two more companies joined this initiative, which is now composed of 51 entities and counting on individual participations from relevant players of the Media and Content value chain industry.
NEM PORTUGAL also disseminates the strategic research agenda, which has recently been updated. It also promotes the cooperation among industrial players and research institutions, with CHIC project being an illustrative example.

NEM INITIATIVE

The NEM community expressed its willingness to consider the content sector as a strategic European sector to invest on, more so when there is a need for investment on infrastructures. We need to avoid having the most powerful digital infrastructure in Europe in order to transmit only the content derived from other regions of the world. The NEM community has high expectations from the next Research Framework Programme, hoping to have specific slots dedicated to the development of new technologies for future proof content.
In 2018, NEM INITIATIVE updated its vision, by working on a revised Strategic and Research agenda, disseminating position and white papers, sharing and promoting our actions during our General Assemblies and the NEM summit.
Teresa Andrade was INESC TEC's contact person in this summit.

TEC4 AGRO-FOOD

Co-shaping the digital evolution in agro-food and forestry.

TEC4AGRO-FOOD is the INESC TEC innovation area to induce a market pull drive into RTD and generate a convergence of knowledge and competencies into producing solutions for Agro-Food and Forestry.

TEC4AGRO-FOOD has competencies in the main technologies involved in the digital (r)evolution of Agro-Food and Forestry, i.e. IoT, Artificial Intelligence, Robotics and Big Data.

TEC4AGRO-FOOD follows-up results in the range TRL 1-7 and focuses on applied research leading to products and services (TRL 5-7).

The mission of TEC4AGRO-FOOD is co-shaping the digital (r)evolution in Agro-Food and Forestry to tackle the productivity and sustainability societal challenges towards an effective bioeconomy.

PROMOTION AND DISSEMINATION

FIMA

Participation in one of the most important European fairs for agriculture machinery - FIMA (International Fair of Agricultural Machinery) in Zaragoza, Spain, with the exhibition of the cistern developed in collaboration with HERCULANO (with the key message "Made by HERCULANO, powered by INESC TEC").

AGROIN

Participation in one of the most relevant Portuguese agricultural and forestry events - AgroIN - , organised by the magazine Vida Rural and represented by Filipe Santos (CRIIS) as a key note speaker with the presentation "How to use technology to enhance the sustainable agriculture?".

AGROGLOBAL

Participation in the most important Portuguese professional agricultural and forestry fair - Agroglobal - , with an exhibition at the Technology Pavilion, presentations at the Tech Stage and the demonstration of the cistern developed in collaboration with HERCULANO (with the key message "Made by HERCULANO, powered by INESC TEC"). A collaboration protocol was also signed with HERCULANO, in the presence of the Portuguese Minister of Agriculture, Forestry and Rural Development.

AGRO INOVAÇÃO

Participation in one of the most relevant Portuguese agricultural and forestry events - Agro Inovação - National Innovation Summit in Agriculture, Forestry and Rural Development - , organised by the Portuguese Ministry of Agriculture, Forestry and Rural Development, alongside CoLABs ForestWISE and Vines&Wines, among others.

FORESTRY 4.0 UNAC SEMINAR

Participation in the seminar "Forestry 4.0 - Digitalisation in creating value and competitive advantages for forest management and production", organised by the Union for the Mediterranean Forest (UNAC) and represented by Alexandra Marques (CESE) as a key note speaker with the presentation "Digitalisation in the Forest Value Chain: Facts and Trends".

FORESTRY INVENTORY SPCF SEMINAR

Participation in the seminar "Occupation, Land Use and Forest Inventory: Decision Support Tools", organised by the Portuguese Society of Forest Sciences (SPCF) and represented by Alexandra Marques (CESE) as a key note speaker with the presentation "Decision Support Tools".

RELEVANT ACTIVITIES

AGROBOFOOD

Submitted application for agROBOfood: Business-Oriented Support to the European Robotics and Agri-food Sector towards a network of Digital Innovation Hubs in Robotics and a strategic H2020 European project regarding Digital Innovation Hubs for the agri-food sector. The project was coordinated by the Wageningen University & Research, being recently approved.

DEMETER

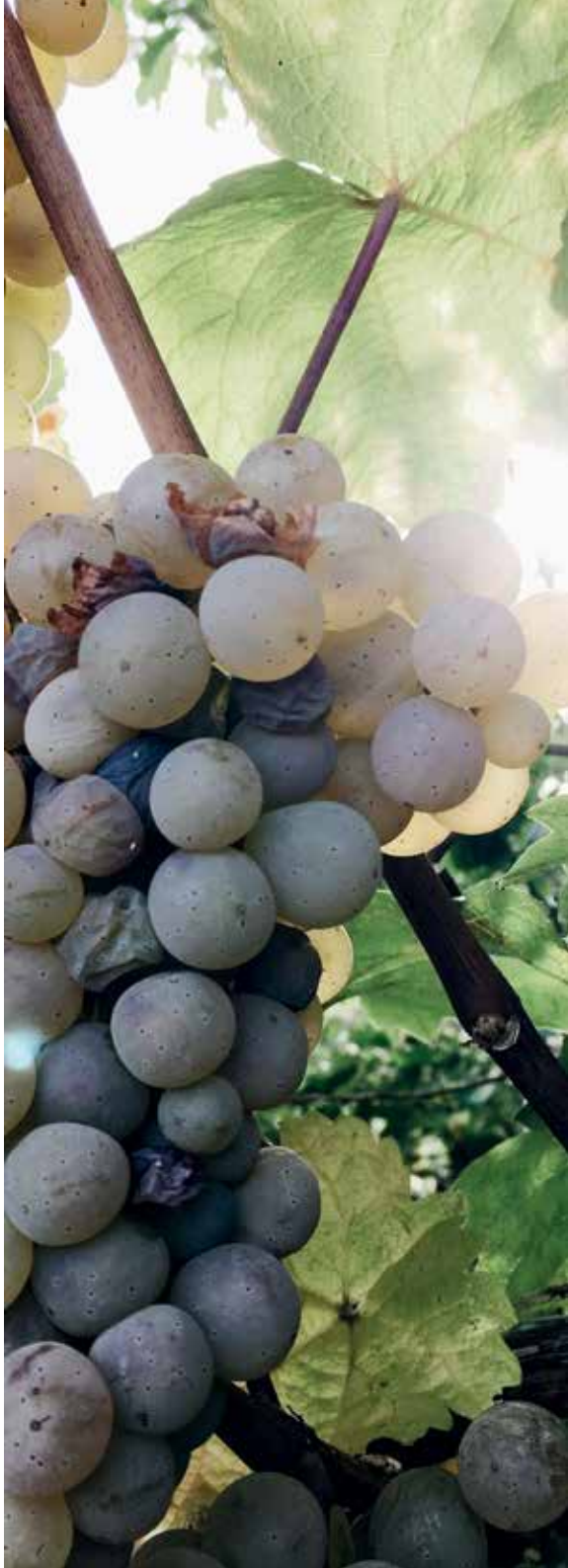
DEMETER - Building an Interoperable, Data-Driven, Innovative and Sustainable European Agri-Food Sector, a strategic H2020 European project regarding digital integration platforms for the agri-food sector, coordinated by the Wageningen University & Research.

SMART FERTILIZERS

Approval (with a distinctive evaluation) and launch of the SMART FERTILIZERS - Tankers for Precision Fertilising in an agriculture 4.0 context and a direct contract with HERCULANO (under a PT2020 Individual R&D Project).

CERVIM

Acceptance to join the network between the Centres and the Research Institutes of the Centre for Research, Environmental Sustainability and Advancement of Mountain Viticulture (CERVIM).



STRATEGIC INITIATIVES

COLLABORATION PROTOCOL WITH HERCULANO

Signing of a collaboration protocol with HERCULANO at Agroglobal, in the presence of the Portuguese Minister of Agriculture, Forestry and Rural Development, for joint research and innovation activities in Smart Precision Agriculture and Forestry.

COLAB VINE&WINES

Signing of the protocol for the creation of the CoLAB Vines&Wines - competitiveness and sustainability of the Portuguese vine and wines, and membership of the Vine and Wine Cluster (ADVID).

COLAB FORESTWISE

Legal constitution of the CoLAB ForestWISE - Collaborative Laboratory for Integrated Forest & Fire Wise Management, with INESC TEC being the promoter of the initiative.

TEC4 INDUSTRY

Foster transformation for an innovative, collaborative, human-centred and sustainable industry.

TEC4INDUSTRY is INESC TEC innovation area to induce a market pull drive into R&D and generate a convergence of knowledge and competences into solutions for the Retail and Manufacturing Industry, covering end-to-end supply chain actors, anchored in a history of successes and impact in technology transfer to companies.

TEC4INDUSTRY monitors results in the range TRL 1-9 and focuses on applied research leading to products, processes and services (TRL 5-9) that can be transferred to companies.

TEC4INDUSTRY covers all the value chain actors and processes, and is committed to bringing unique knowledge and solutions to logistics, manufacturing industry, distribution, and retail.

PROMOTION AND DISSEMINATION

EMAF

Within this fair, a set of TEC4INDUSTRY initiatives were presented to national and international entities. Projects based on 360° video with dynamic annotations, advanced plant model, digital twin technique, asset management, predictive maintenance, collaborative automation and robotics were exhibited.

TECHDAYS 2018

Results of the TEC4INDUSTRY initiative were presented to national entities in this event, which was held in Aveiro .

RELEVANT ACTIVITIES

DIGITAL TWINS FOR FACTORY DESIGN

INESC TEC supported a number of companies in the design and redesign of factories, at national and international level, using a methodology and software tools developed internally, based on its long experience in industry and logistics systems design.

HORSE

HORSE (Smart integrated Robotics system for SMEs controlled by IoT based on dynamic manufacturing processes) aims at promoting a step forward in the manufacturing industry, by proposing a new flexible model of a smart factory involving collaboration of humans, robots, Autonomous Guided Vehicles (AGV's) and machinery to accomplish industrial tasks in an efficient manner.

NEW SHOE FACTORY

Study and design of an organisational and operational model of a new industrial unit for the production of footwear.

TEC FEL LOGÍSTICA 4.0

Development of intelligent logistics systems aimed at improving the sustainability of supply chains in the circular economy. The project intends to investigate advanced and intelligent optimisation methods for flexible planning of the transport at lower costs, the models of which include uncertainty and dynamic adaptation to "just-in-time" information.

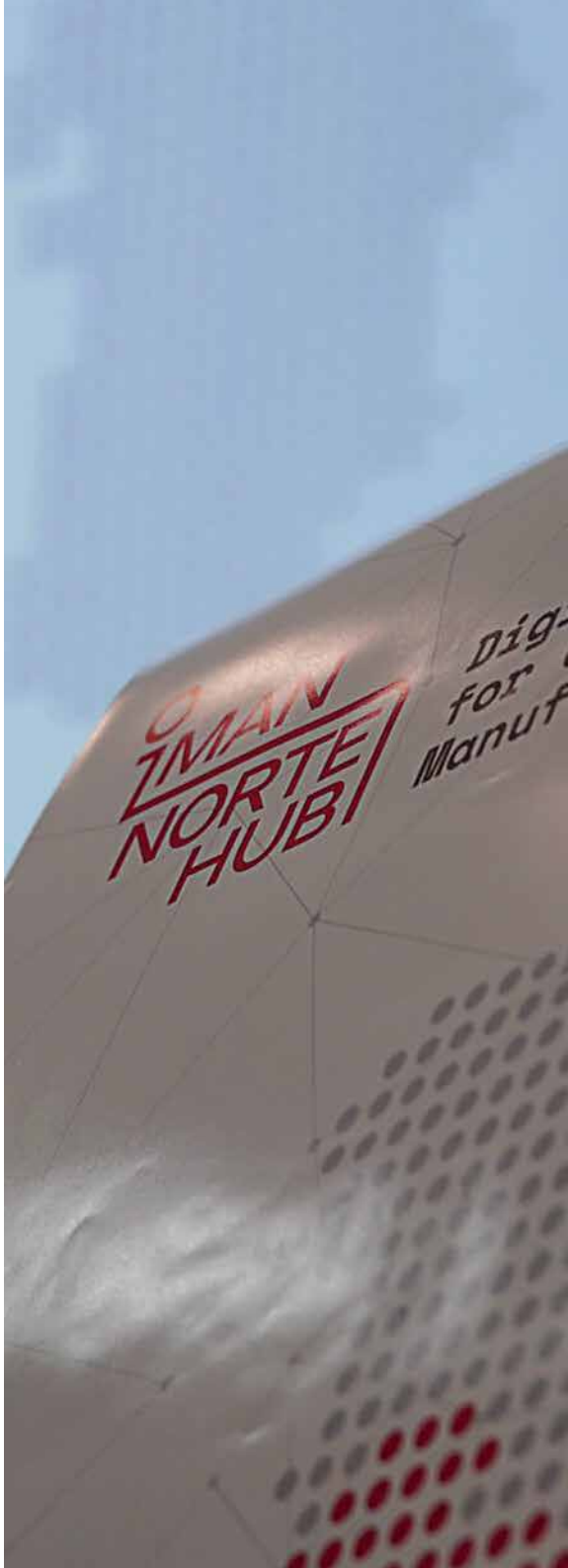
STRATEGIC INITIATIVES

PRODUTECH SIF

INESC TEC is a key partner of the Mobilizing project PRODUTECH SIF (Solutions for the Industry of the Future) that aims to provide an integrated response for the development and construction of new production systems, based on advanced production technologies, to allow the manufacturing industry to respond to the challenges of the 4th industrial revolution.

IMAN NORTE HUB

INESC TEC is part of the Digital Innovation Network for the industry in the north of Portugal, aiming to foster the digital transformation of manufacturing companies and to nurture their respective innovation ecosystem of the region.



FOOTURE 4.0

INESC TEC headed the technical coordination of the FOOTURE 4.0, known as the Roadmap of the Footwear Sector for the Digital Economy. This is a strategic document that defines an action plan and the required conditions so the sector can benefit from the opportunities of the digital revolution.

TEC4 ENERGY

Decarbonization and digitalization of the energy sector.

TEC4ENERGY is the leading innovation area that responds to the societal challenge "Secure, clean and efficient energy", addressing the major challenges of the sector, namely the ongoing digitalization and the large-scale integration of renewable based generation, proposing a multidisciplinary scientific based approach to overcome the limitations that the different stakeholders find in the existing market solutions. The focus will be on the implementation of optimised, intelligent and sustainable solutions, in software and hardware, for all agents (utilities, industry, transportation, retail) that operate in a broadly defined energy-concerned social structure, including water or waste management when intimate connection with energy, keeping in mind climate change and global warming challenges. The TEC4ENERGY benefits from a strong recognised INESC TEC expertise in Power Systems, with more than 20 years transferring research results to manufacturers, software vendors, electric utilities and large energy users in Portugal, Europe and Brazil. This adds credibility to a broader effort, extended also to the fossil fuel sector, and encompassing from industry to transportation, buildings and energy efficiency.

PROMOTION AND DISSEMINATION

VIENNA - EUROPEAN UTILITY WEEK 2018

INESC TEC participated in the EUW 2018 in Vienna, presenting the most advanced outcomes of INESC TEC in the energy field. The European Utility Week platform is the best forum to meet top-level European energy professionals and to negotiate with them, to create new relationships and to promote new projects.

WORLD ENERGY DAY IN SÃO MIGUEL - AZORES

INESC TEC participated in a panel discussion at the World Energy Day in São Miguel – Azores, discussing Electromobility and Smart Grids deployment to support the decarbonisation of the society and the economy, and presenting the technological trends in this field.

CONFERENCE OF THE PORTUGUESE ASSOCIATION FOR THE PV SECTOR (APESF)

INESC TEC presented the relevant technological trends to exploit solar PV energy, at the household level, via the Home Energy Management Systems (HEMs), which would maximise the usage of electricity when solar PV generation is available.

THE PORTUGUESE ECONOMY AND INDUSTRY 4.0 - THE GROUND FOR A NEW INDUSTRIALISATION

INESC TEC participated in a panel discussion entitled "Discussion of the challenges for increasing the energy efficiency of industrial processes in a context of industry 4.0 and internet of things". The business opportunities and models emerging from local renewable energy generation and flexibility markets (at the wholesale market level) were also discussed.

"GRANDE CONFERÊNCIA ÁGUA E ENERGIA"

INESC TEC participated in the "Grande Conferência Água & Energia 2018", where the water-energy nexus was discussed, namely the technologies that can support efficency in both sectors, the benefits of having an integrated management and the future challenges for both sectors.

RELEVANT ACTIVITIES

"PORTO DE PESCA SUSTENTÁVEL"

The consulting activities to be developed by INESC TEC aim at defining the transformation process of the fishing ports to become sustainable in terms of the environmental and social perspectives. The integrated intervention includes water consumption, waste produced/collected, energy consumed/produced (involving local power generation facilities and an increase in the use of energy efficiency) as well as the communities and the stakeholders of the port.

INTEGRID

This EU funded project, led by INESC TEC, aims at bridging the gap between citizens and the providers of technologies and solutions such as utilities, households, manufacturers and all the other agents who provide energy services, thus expanding from the distribution and access services of the Distribution System Operators (DSOs) to active market facilitation and system optimisation services while ensuring sustainability, security and quality of delivery. In this project, the integration between electric vehicles (EVs), Home Energy Management and distributed resources will go one step further. Prototypes for energy storage, Home Energy Management Systems (HEMS) and EV chargers are being developed.

CORAL

INESC TEC, in partnership with CIIMAR, successfully completed the results of this project and publicly presented them.The project developed technology-driven solutions to tackle deep sea resource exploitation under a sustainable environmental framework. A special platform was developed in order to harvest renewable energy sources and to store the electrical energy to feed autonomous submarine robots.

STRATEGIC INITIATIVES

LABORATORY OF SMART GRIDS AND ELECTRIC VEHICLES (SGEV)

INESC TEC pursued its ambition to set up an infrastructure dedicated to support research, to develop and to test smart grid architectures and solutions (software and hardware) in order to further foster the smart grids concepts. This laboratory is part of the National Roadmap of Research Infrastructures.

CONTRACT-PROGRAMME WITH EDP

The long-term Contract-Programme with EDP, which was launched in 2014, was continued, allowing to start several new projects involving the different INESC TEC's Centres. In the last five years, about a million Euros from projects have been hired by INESC TEC.

LONG-TERM PARTNERSHIP WITH EFACEC

The long-term partnership with EFACEC, which started in 1996 and aimed at developing a Distribution Management System (DMS), was celebrated in 2018. A new collaboration protocol was also signed to strengthen the collaboration for the future.

TEC4 HEALTH

User-centred ICTs to improve health care and personal wellbeing.

The mission of TEC4HEALTH is to induce a market pull human centered systems engineering R&D targeting healthcare and personal wellbeing challenges towards personalized medicine, healthier life style and better health systems management.
TEC4HEALTH is the INESC TEC innovation area to induce a market pull drive into R&D and generate a convergence of knowledge and competences into producing solutions for the Health Economy.
TEC4HEALTH monitors results in the range TRL 1-9 and focuses on applied research leading to products, processes and services (TRL 5-9) that can be transferred in 3 broad areas of application: healthcare providers (primary, secondary and long-term care); patient monitoring (medical devices, e-health, m-health); pharmaceutical industry.
TEC4HEALTH, covering all the value chain actors and processes, is strongly committed to bringing unique knowledge and technologies to solve challenges in: disorders, personalized medicine, healthy life style and health systems management.

PROMOTION AND DISSEMINATION

E-HEALTH SUMMIT

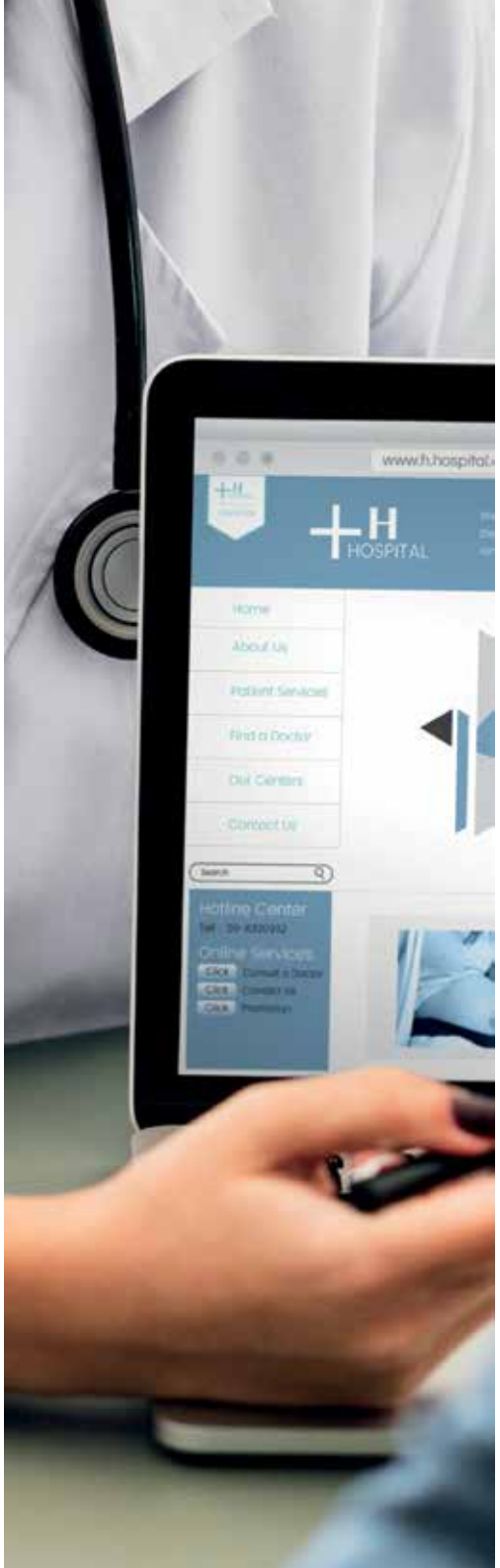
Within this fair, and with an exposition and a conference promoted by the Shared Services Ministry of Health (SPMS), INESC TEC's participation was made through the robotic demonstration in Trivalor's stand, a partner of the institution in the project IGOR.
This event was also an opportunity for B2B meetings and presentations of the competences of the TEC4HEALTH team.

"PRAÇA DA SAÚDE"

In this showcase, three project demonstrations (WeSENSS, ISEABlind and Passus) of the TEC4HEALTH initiative were presented to national and international entities, namely to EIT-Health.

INNOVATION AFTER HOURS

The institutional participation in the first event of the José de Mello Saúde company, which dedicates itself to innovation, allowed to show three project demonstrations, giving visibility to some members of the TEC4HEALTH team and their skills in the analysis of health data, optimisation and simulation, IoT, inclusive digital interfaces and computer vision.



RELEVANT ACTIVITIES

NIE PROJECT - NATURAL INTERFACES FOR THE ELDERLY

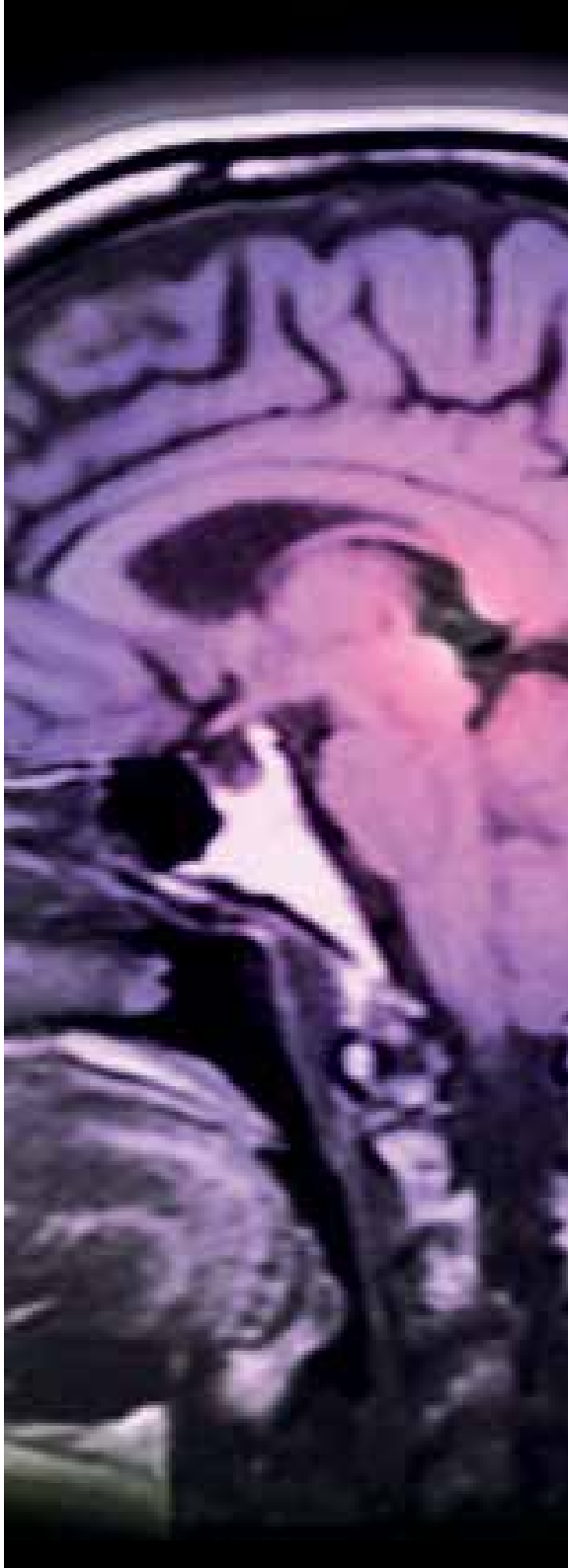
The prototype of a robotic system that helps the elderly to take medicines was one of the results of the collaboration between INESC TEC's Centre for Information Systems and Computer Graphics (CSIG) and the Superior School of Health of the University of Trás-os-Montes and Alto Douro (UTAD).The developed laboratory prototype was based on the educational robot NAO, which has a set of motors that control the articulations, and cameras to assess the surrounding environment, as well as the ability to listen and to understand the human speech while also being able to communicate in several languages.

HOVIONE CAPITAL PRIZE

The project NeuroQ from INESC TEC was the winner of the i3S Hovione Capital Health Innovation Prize award, a joint initiative of i3S and Hovione Capital, which aims at distinguishing innovative ideas in the healthcare area. NeuroQ is a wearable device for wrist rigidity evaluation for supporting surgical procedures.
The project also won an Aescuvest award, totalling EUR 52,500. This award is an example of the recognised forefront in the wearable expertise of the TEC4Health team.

ICARE4DEPRESSION

This project combines face-to-face psychotherapy with digital mobile and internet solutions in order to support the treatment of depression. It also consists in the combination of psychotherapy sessions with mobile applications and web platforms in order to enhance the effects of the treatment and to reduce the costs associated to it. A pilot study is being conducted to test the available digital tools and to improve the assessment and intervention process with them. The goal is to enhance the access to the treatment for depression, to reduce the costs and to increase the clinical effectiveness.This project is enfolded in a set of research projects known as Moodbuster, one of the five projects nominated for the European Health Awards of 2018.



STRATEGIC INITIATIVES

EIP ON AHA CONFERENCE

INESC TEC, as a member of the Consortium of Porto4Ageing, a reference website in the European Innovation Partnership (EIP) on Active and Healthy Ageing (AHA), assumed two commitements at the EIP on AHA Conference in two specific action groups: action group C2 - Personal User Experience (PUX) - producing a document with guidelines for manufacturers and developers of Active and Healthy Ageing solutions aiming for a Personal User Experience; and an action group D4 – the age friendly environments.

PORTUGUESE NETWORK HEALTHY, INTELLIGENT AND FRIENDLY ENVIRONMENTS

INESC TEC integrates this network that gathers a wide group of Portuguese organisations committed to promote an united schedule for the implementation of inclusive atmospheres for all ages, prevalent in the Health, Social Support, TICE and Infrastructures areas. It focuses on the quadruple helper participation and actively promotes the cooperation between research/ academia, public authorities, companies and civil society/citizens, with the aim of finding common solutions to the national challenges in this area.

SHAFE - THEMATIC NETWORK ON SMART HEALTHY AGE-FRIENDLY ENVIRONMENTS

Following the Blueprint on Digital Transformation of Health and Care, INESC TEC, as a member of this network, supported a joint declaration in 2018. It summed up a common position on smart, healthy and age-friendly environments (AFE), with priorities for the formulation of policies and recommendations. The priorities are focused on providing a forum for the exchange of political priorities and technical knowledge in AFE and eHealth / mHealth; informing the Commission and the Member States about the available knowledge in the community concerning the needs, solutions and good practices of the partners; taking the best local practices that are already implemented so that they can be doubled while collecting the lessons learned for the drawing of new policies; promoting common beginnings as interventions centred in the person, protection of personal data, standardisation, and interoperability.

SPECIAL INITIATIVES

2ª Conferência do FÓ
12 dezembro 201
PORTUGAL
INCoDe.2030

UT AUSTIN PORTUGAL

The UT Austin Portugal Program is a partnership program in Science and Technology between the Portuguese Foundation for Science and Technology and the University of Texas at Austin, supported by the Ministry of Science, Technology, and Higher Education in close collaboration with the Council of Rectors of the Portuguese Universities.

National Directors: José Manuel Mendonça and Rui Oliveira

Launched in 2007, the partnership was renewed in 2018, towards a new decade until 2030. The UT Austin Portugal Program addresses a number of knowledge areas where scientists and companies in Portugal will engage with the University and other institutions in Texas in multidisciplinary research and technology transfer and commercialization: nanotechnologies; advanced computing; medical physics; space-earth interactions and technology innovation and entrepreneurship. The vision is to develop knowledge-based society, and foster science and innovation-based companies to help Portugal face the challenges of the future.

The main activities developed during 2018 included:

— The planning and coordination of the workshop "UT Austin and Portugal Building the Future" under the "Global Science and Technology Partnerships Portugal", which aimed to present the opportunities and challenges brought by the third phase of the Program, from 2018 to 2030.
— The launch of an intensive training program in Advanced Computing - ACTP, Advanced Computing Training Program, under which researchers in Portugal were granted fellowships to spend up to 4 months at the University of Texas at Austin's Texas Advanced Computing Center. A total of 14 candidates were selected.
— The participation in the "Ciência 2018" Summit in Lisbon, where a session devoted to the Program was organised under the theme "UT Austin and Portugal – Emerging Challenges of Knowledge". The session brought together a panel of experts in the Program's areas of knowledge.
— A roadmap for a smooth takeover of the Program by the new leadership and executive teams. These activities included: the definition of the governance and financing models for the third phase of the international partnership; the definition of the core scientific areas of the Program; the design and planning of new instruments, in close collaboration with FCT, UT Austin, and the Program's Areas Directors; the development of a brand-new visual identity and communication strategy.

DIGITAL COMPETENCE INITIATIVE

In 2018 the Digital Competence Initiative was developed under the National Initiative for Digital Competences, e.2030, the Portuguese acronym of which is INCoDe.2030, created by a Resolution of the Council of Ministers of 13th of February and running under the supervision of the Minister of the Presidency and Administrative Modernisation and the Minister of Science, Technology and Higher Education.

Coordinator: Pedro Guedes de Oliveira

INCoDe.2030 is structured in 5 Action Lines (AL):
AL 1, INCLUSION: making sure that the whole population has equal access to digital technologies to obtain information, communicate, and interact with others;
AL 2, EDUCATION: stimulating digital thinking among young population, reinforcing digital literacy and competences at all levels of schooling and as part of lifelong learning;
AL 3, QUALIFICATION: qualifying the working population by providing them with the knowledge they need to become a part of a labour market that relies heavily on digital skills;
AL 4, SPECIALISATION: promoting specialisation in digital technologies and applications to improve employability and create a higher added value in the economy;
AL 5, RESEARCH: enhancing the conditions for the production of new knowledge and active participation in international R&D networks and programmes.

The coordination of the program was assigned to Pedro Guedes de Oliveira, with two Associated Coordinators: Sofia Marques da Silva, Prof. at FPCEUP, and Nuno Rodrigues, Prof. at IPCA. The group activities were supported by FCT that for this purpose signed a protocol with INESC TEC, and INESC TEC payed for 60% of Sofia's time through an agreement with FPCEUP. The team could also count with the collaboration of Prof. Francisco Vaz for some special tasks and the secretarial and administrative support of Lucília Fernandes. Finally, João Neves was also involved in a special group dedicated to planning an Integrated Network for Public Communication Services.
Outside the 5 Action Lines, an action plan to implement the Integrated Network for Public Communication Services will be carried out. The studies concerning the Network were developed by a working group nominated by the Portuguese Government, the rapporteur of which was João Neves that will have a main responsibility in the future effort.
The team that includes Sofia Marques da Silva, Nuno Feixa Rodrigues and Lucília C. Fernandes, will promote all the necessary activities concerning the global coordination of INCoDe.2030.

Director-President: Vladimiro Miranda

From the point of view of the interests of INESC TEC, INESC P&D Brasil had an interesting evolution in 2018:

- 2018, a year of important growth - in projects, budget and human resources;
- Balanced budget and execution, at the level of R$4.5 million;
- 6th consecutive year with positive accounting balance;
- Internationalisation, developing joint projects with INESC TEC, including in the Horizon 2020 EU-Brazil framework;
- Four new federal universities becoming formal associates of the juridic association INESC P&D Brazil.

INESC P&D BRASIL

INESC P&D Brasil is a private non-profit R&D association, recognized by the Brazilian Government. It coordinates the joint work of research groups within its associates, belonging to 14 top Brazilian universities.
As an independent institution, the partners agreed to trust INESC TEC with the leadership of the shared management, to explore synergies in projects in South America and the European Union.
INESC TEC is the single Portuguese institutions to create and operate a research institute overseas, in a unique internationalization process. The benefits are clear: scientific cooperation, access to valuable human resources, import/export of technologies and creation of a dense network of alliances in South America.

2. MANAGEMENT MODEL AND HIGHLIGHTS

INFRASTRUCTURES

INESCTEC
TECNOLOGIA E CIÊNCIA
LABORATÓRIO ASSOCIADO

OUR INFRASTRUCTURES
FCT ROADMAP

INESC TEC creates new knowledge and technology to improve products, processes, services and business models, contributing to the competitiveness of companies and institutions, and benefiting society.
This knowledge is built upon a base of rigorous scientific research, and in a dynamic research environment that enables the institute to engage and foster the development of excellent researchers.
The commitment to the reinforcement and internationalization of INESC TEC's research infrastructures is essential to ensure the competitiveness of this research environment.

SMART GRIDS AND ELECTRIC VEHICLES LABORATORY

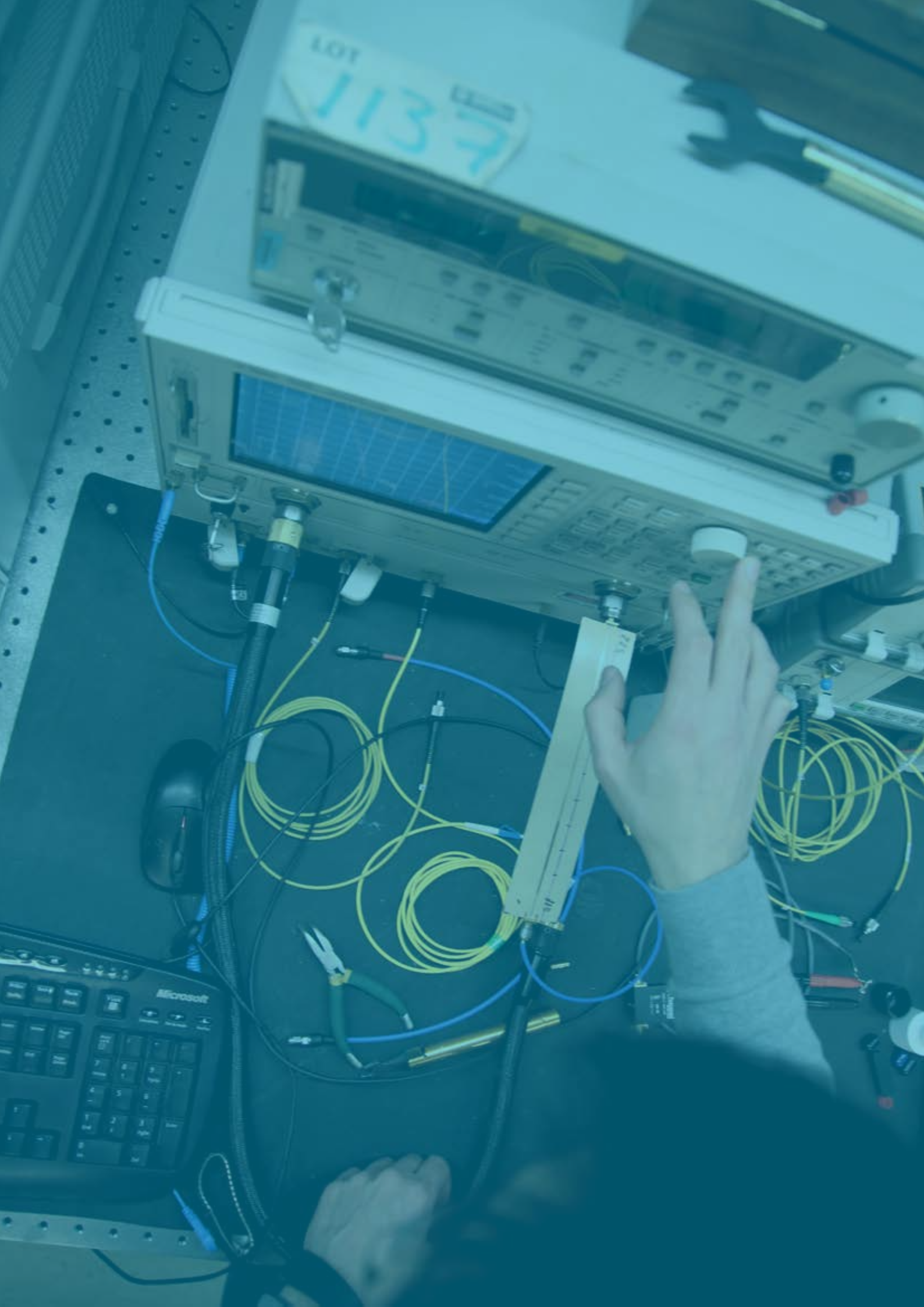
The Smart Grids and Electric Vehicle Laboratory constitutes a physical space integrating systems and equipment designed to support the development and testing of solutions and pre-industrial prototypes, promoting active and intelligent management of electric grids in scenarios with a progressive integration of microgeneration together with other distributed energy resources including and Electric Vehicles.

TECHNOLOGIES FOR THE SEA (TEC4SEA)

The TEChnologies for the Sea - TEC4SEA infrastructure, currently under implementation, aims to be a unique and pioneer platform in Europe to support research, development, and test of marine robotics, telecommunications, and sensing technologies for monitoring and operating in the ocean environment.
Its characteristics, geographic location allowing fast access to deep sea, and support of multidisciplinary research, enable full validation and evaluation of technological solutions designed for the ocean environment, allowing researchers to evolve from simulation/lab experiment to field trial.

EUROPEAN MULTIDISCIPLINARY SEAFLOOR OBSERVATORY – PORTUGAL (EMSO-PT)

EMSO-PT is a research infrastructure lead by IPMA (Instituto Português do Mar e da Atmosfera) and involving 15 other research institutions working on ocean science or technology, including INESC TEC.
The ultimate goal of EMSO-PT is to organise the Portuguese contribution to the EMSO-ERIC network, a large-scale European Research Infrastructure, networking fixed point, deep sea multidisciplinary observatories, with the scientific objective of real-time, long-term monitoring of environmental processes related to the interaction between the geosphere, biosphere, and hydrosphere.
It is a geographically distributed infrastructure at key sites in European waters, spanning the Arctic, the Atlantic, and the Mediterranean, up to the Black Sea. It will be in place by the end of the decade.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SELECTED FINANCIAL DATA

REVENUES

The overall revenue in 2018 reached 17.5 million euros, increasing 8%, when compared to 2017. The net income was 24.2 thousand euros, in line with the previous years.

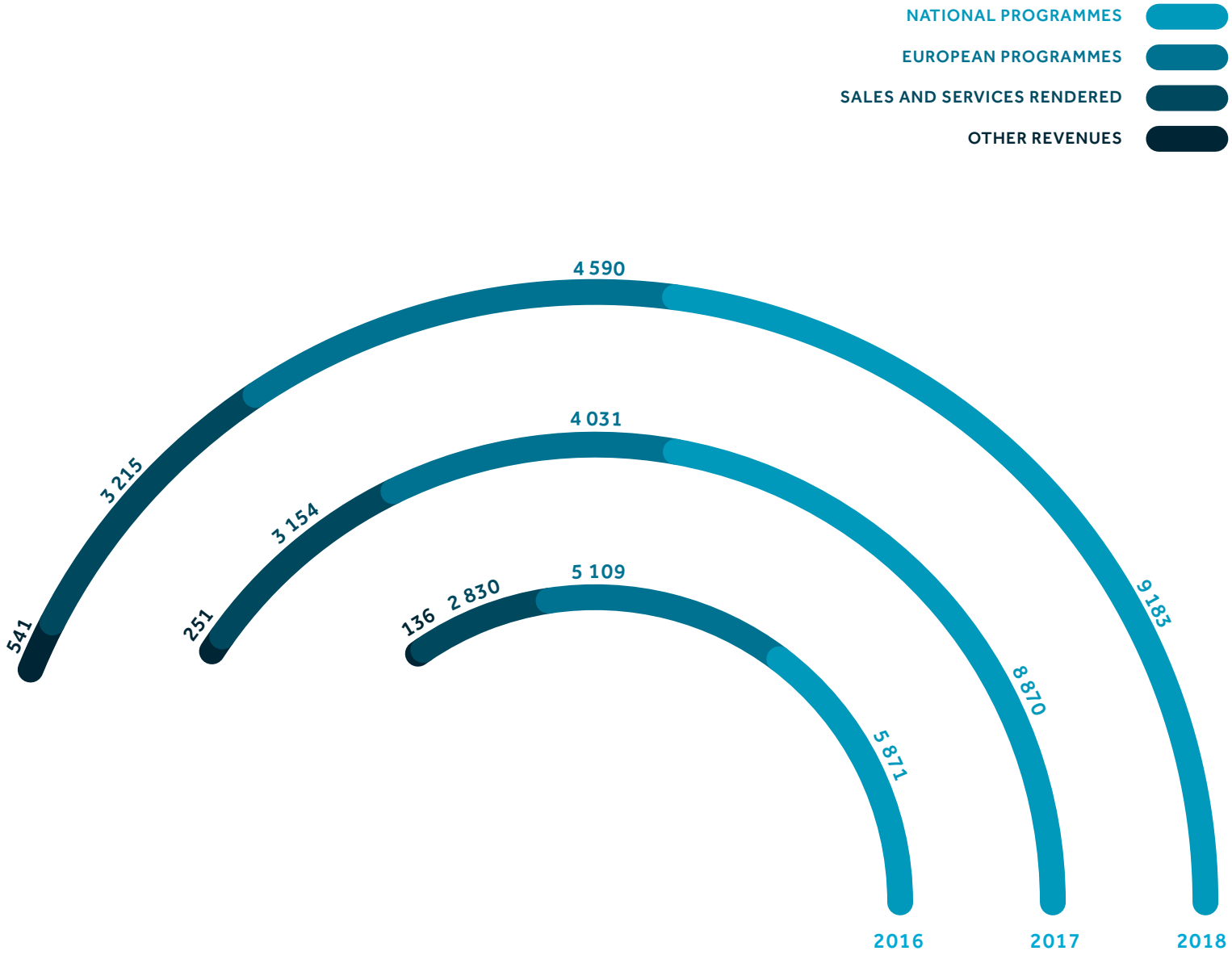

FIGURE 12
Turnover evolution (K€).

EXPENSES

The overall expenses amounted to 17.5 milllion euros in 2018, 8% above 2017.

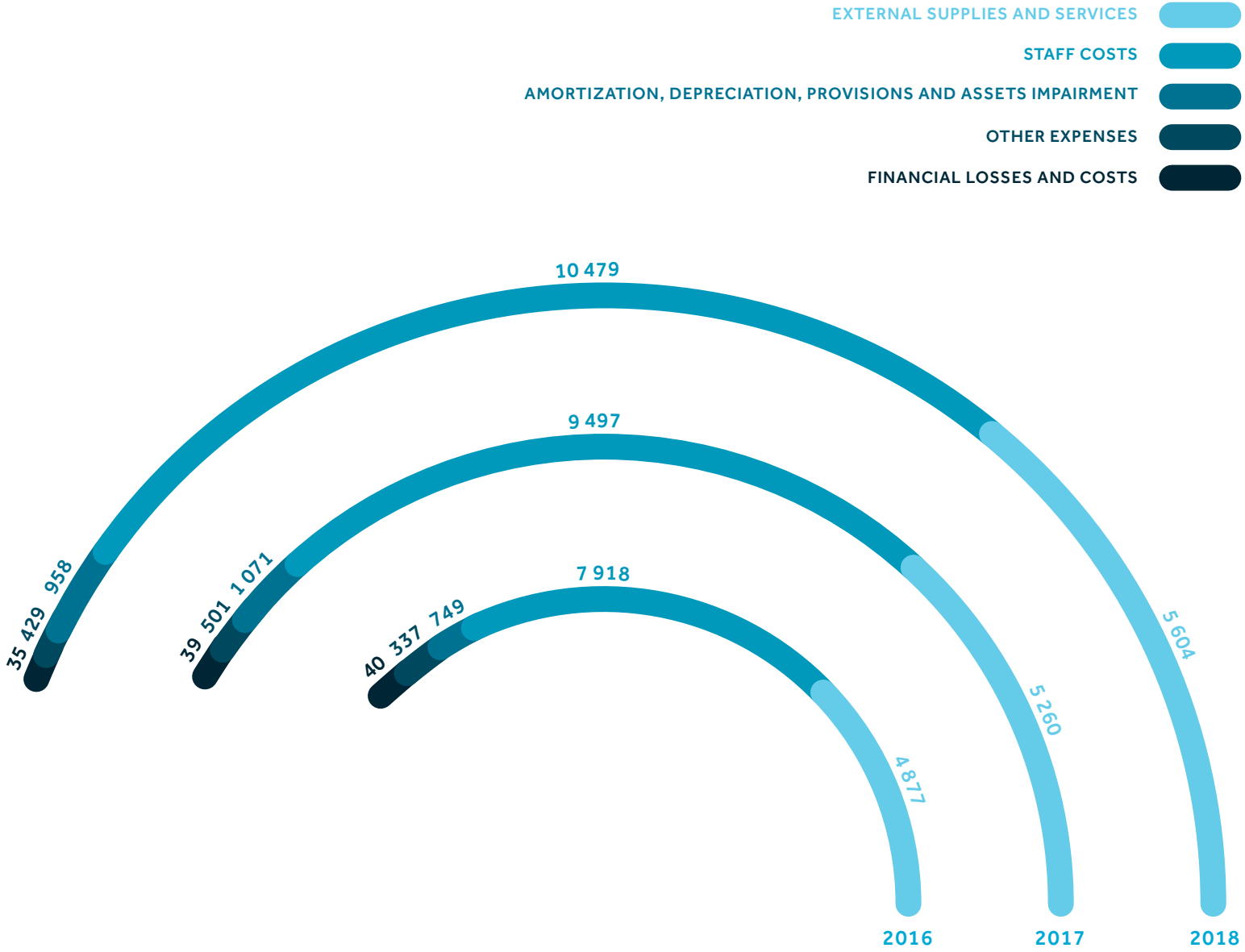

FIGURE 13
Expenses evolution (K€).

ASSETS

The total assets increased 20%, compared to 2017, to 14.4 million euros.

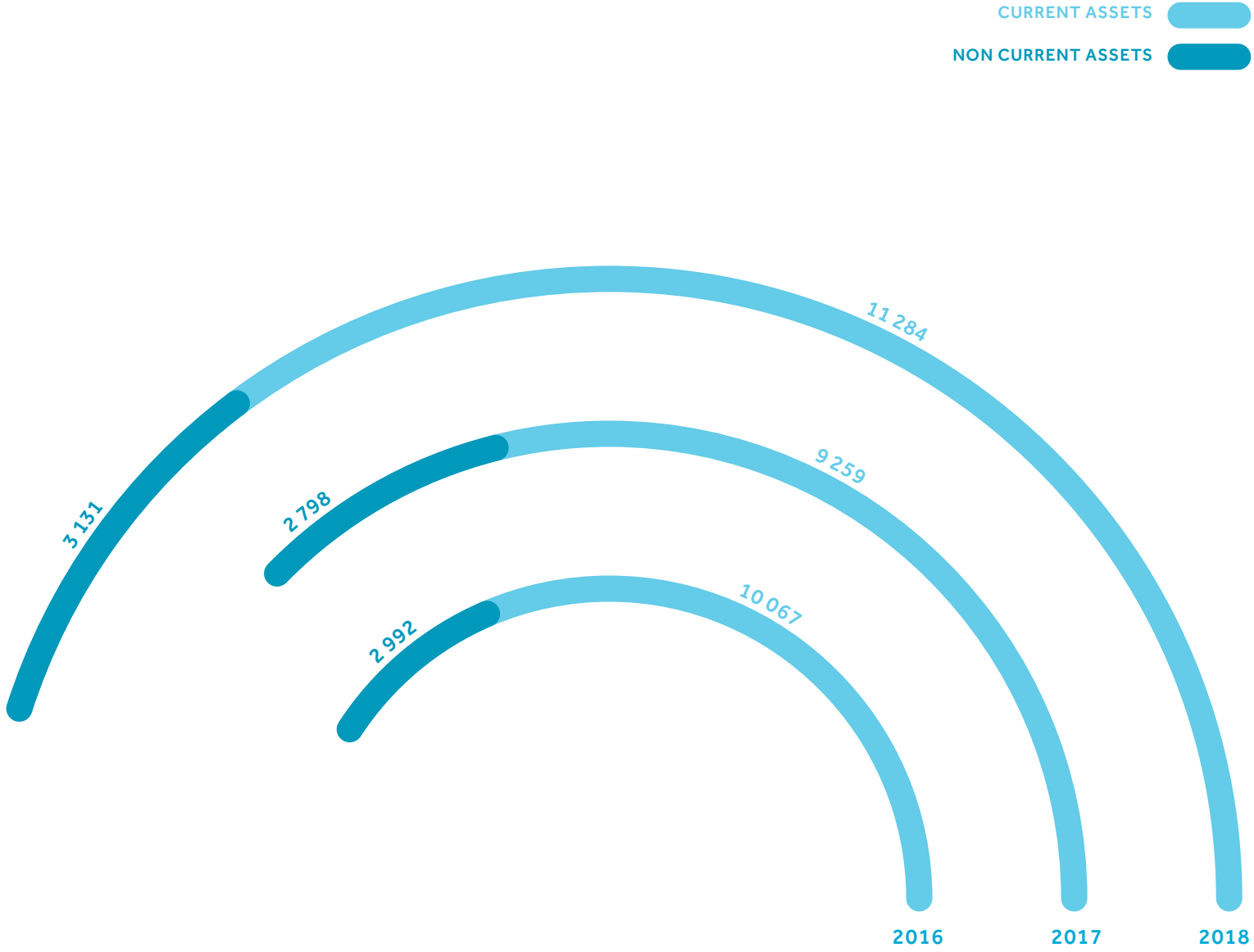

FIGURE 14
Assets evolution (K€).

NET WORTH AND LIABILITIES

The total liabilities grew to 9.5 million euros, a 26% increase, compared to 2017.

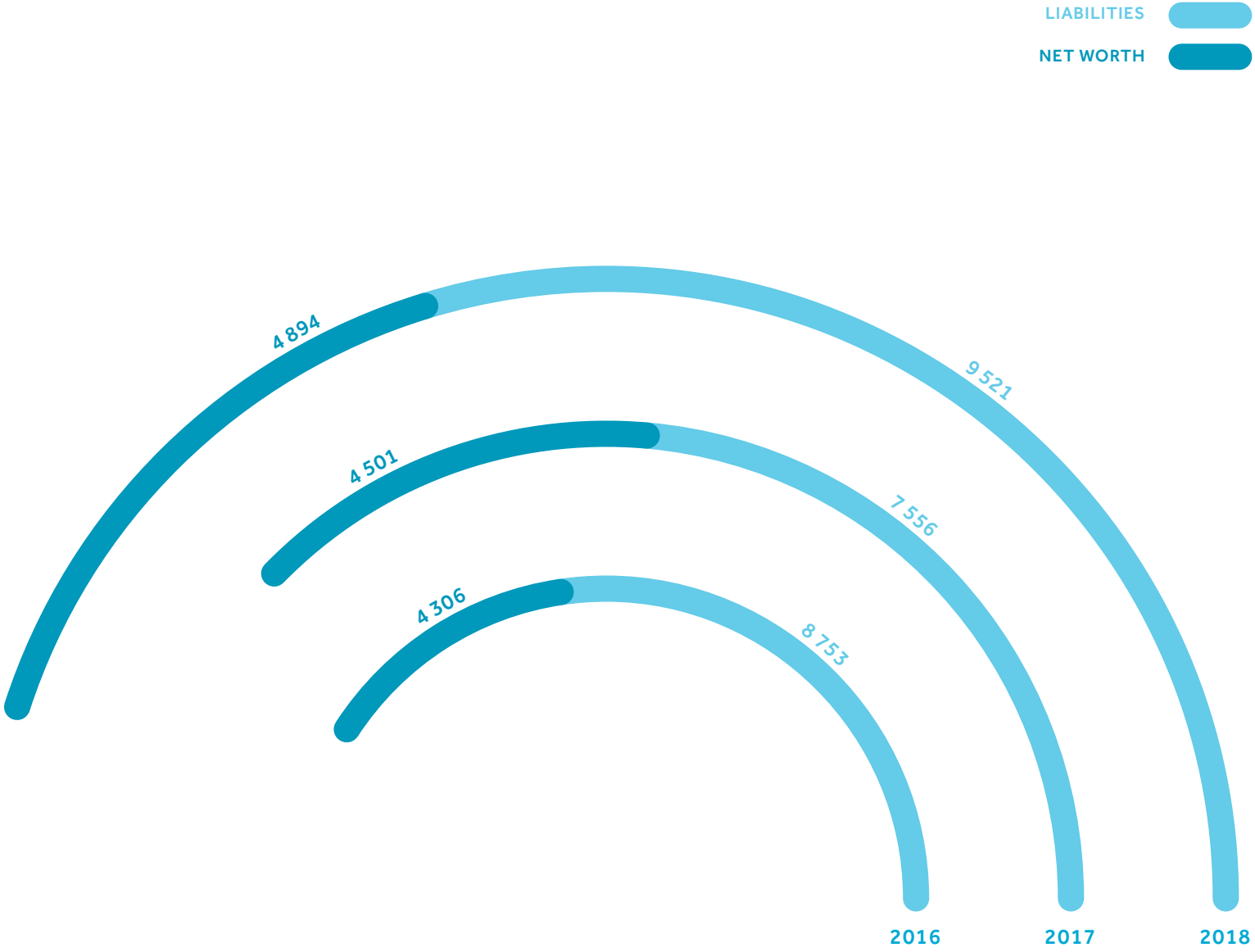

FIGURE 15
Net Worth and liabilities evolution (K€).

TECHNICAL SHEET

DESIGN
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COMMUNICATION SERVICE [SCOM]

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