Interactive
Technologies Institute
LARSyS

# Annual Report 2019

# Content


# A research centre for human-centred design and technology, creating sociotechnical systems suited to global challenges

# About the Institute

ARDITI is the Madeira Autonomous Region Agency for Research, Technological Development and Innovation. ARDITI hosts several poles of national research units of which the Interactive Technologies Institute is one of them. Interactive Technologies Institute is a unit of LARSyS (national associated laboratory of Robotics and Engineering Systems) focussed on the interdisciplinary domain of Human-Computer Interaction (HCI) the discipline concerned with the design, evaluation and implementation of interactive systems for human use and with the study of major psychological and social phenomena surrounding them.

ITI (Interactive Technologies Institute) was born in early 2009 from a group of researchers, who led its formation as an autonomous research unit. That group was a mix of Professors from the University of Madeira (UMa) and Faculty recruited under the Carnegie Mellon International partnership.

This original group of founders was able to get a very positive independent evaluation and join the Instituto de Sistemas e Robótica (ISR) Associated Laboratory (which in the 2013 national evaluation became LARSyS).

At the end of 2009 M-ITI Associação – the not-for-profit institution – was created as an association between the Regional Government of Madeira and UMa. M-ITI was the first and only innovation institute of UMa in an organizational model which aimed at combining Master's-level education with innovation projects and industry. In this model ITI, as a research unit, and the M-ITI Association co-existed under a common vision that combined Master's-level teaching with research and innovation projects.

The sustainability of M-ITI was significantly dependent on teaching and tuition which, in turn, provided academic career positions at UMa.

ITI is the natural evolution of M-ITI into a wider national institutional context which can bring new opportunities for a more distributed sustainability model by drawing and providing career paths that dilute the tensions and focus on a single institution.

The regulations of ITI enable our research unit to maintain its scientific independence while staying connected to the main stakeholders: LARSyS, the University of Madeira, Institute Superior Técnico and the other academic institutions – like FBAUL or ISCTE – that would like to benefit to be associate with an excellence research center like LARSYS. This enables faculty from these institutions to have access and recognition of their research performance in their careers and the institutions to benefit from the accreditation of their academic programs. This distinction also clearly separates the scientific management of the research team and the financial and administrative management of the research grants and projects (including compliance with FCT regulations and legal procedures).

ITI is dedicated to the interdisciplinary field of HCI and encloses Psychology and Social Sciences, Computer Science, and Creativity and Design as core scientific areas. The cross-pollination of these areas allows thriving application areas directed towards societal needs. Assistive Technologies, Learning and Digital Culture, and Sustainability have been identified by ITI as main application areas to build capacity and advance innovation.

HCI with the focus on user needs, tasks, experiences and social and political contexts is well suited to address a new breed of socio-technical systems that combines emerging technologies with the underlying cultural and social fabric. ITI research rests on the following principles: Computing technology must match with human capabilities, taking into account the needs and desires of users and other stakeholders, and economical, cultural and social constraints. To achieve this, we need to: 1) understand human behaviour and development through social and ethical analyses of how people adapt and use technology, 2) develop technology, tools and design methods that support efficiency and creativity, and 3) adopt a risk-taking attitude based on creative ideas for new ways of envisioning technologies that have an impact in the world. Attempts to reach this will lead to general theories and methods that enhance and broaden the field.

# Vision

A research center for human-centred design and technology, creating socio-technical systems suited for global challenges.

Global changes – in climate or demographics; labor systems or capital flows; sustainable resource management or energy efficiency; memes or pandemics – are happening at a pace that could not have been anticipated a few decades ago. Our planet's newest mass extinction is being ushered in by the very same technologies and means of production that were the crowning accomplishments and best practices of our grandparents. It is clear that many of our approaches must change swiftly and radically. Yet our habits of thinking, organizing, and living are largely configured to address the challenges and goals of prior epochs, and most of our tools still reflect and support those old habits. Our current technologies and material culture impede rather than enable our ability to live appropriately. We must mindfully design new materialities that foster inclusive, innovative, and reflective societies in a changing world.

ITI aims to step into the new millennium by developing tools, systems, and techniques better suited to address its challenges. In particular: the distribution and use of natural resources, the societal and personal use of energy, global inequality of resources and opportunities, and the relationship of production and consumption all require serious reform. Reducing inequalities and social exclusion in Europe, overcoming economic and financial crises, and tackling unemployment require new ideas, strategies, and governance structures that bring opportunities to the young and creative generations and leverage the reflective European society to position Europe as a global actor.

The long-term vision of ITI is an excellence center of human-centred design and technology for global change, aimed at identifying fresh approaches to the design of new technologies, platforms and socio-technical systems that are better suited to the global challenges of this century. Some of these challenges might be unique to Europe but others are shared by communities around the world. By projecting ITI into the future of challenge-based research we envision exploring, designing for, and at times even anticipating global critical situations and opportunities for change. Strategically placed at the intersection of the American, European and African sides of the Atlantic, ITI is poised to play a crucial role in connecting, exchanging, and contributing to the innovation across the continents with which Portugal enjoys a strong relationship. As a multi-disciplinary center combining natural and social scientists, engineers, humanists, designers, and artists, its output will be focused on the area of applied science and human-centered technology. We will develop and share methods, working proofs, and spin-offs focused on rebalancing the relationship of people and environment, production and consumption, the local and the global.

# Our Mission

Advances in ICT have fundamentally changed the way people work and live across the globe, a trend that is accelerating as the influence and impact of ICTs spread to ever greater scopes of activity. Computing has moved beyond merely increasing productivity at work to providing individuals with unprecedented access to information and powerful new ways to communicate. In the decades since the computer became personal, the relevance and scope of the field of HCI has grown in tandem with computing technology. Research in ICT no longer asks “what can we build?” but instead “what should we build?” HCI researchers and practitioners, with their focus on user needs, tasks and experiences are well suited to address these new kinds of questions. HCI is the discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.

ITI rests on the following principles:

**1** Computing technology must match with human capabilities, taking into account the needs and desires of users and other stakeholders, and economical, cultural and social constraints;

**2** To achieve this goal, we need to:

i) understand human behavior and development through social and ethical analyses based on empirical studies of how people adapt and use technology;

ii) develop technology, tools and design methods that support efficiency and creativity in design; and

iii) adopt a risk-taking attitude based on creative ideas for new ways of envisioning interactive technologies and services that have an impact in the world;

**3** Attempts to reach this goal will lead to general theories and methods that enhance and broaden the field.

# Strategy and Research Infrastructure

ITI will serve as a hub for a global network to ideate, co-create, test, and document new forms of local/global production for global challenges. The goal of these efforts is not just the generation of new understanding of problem solving in an era of cheap information, but also tangible proofs of organisation through the creation of enterprises that embody and engage in that problem solving. Our research will result in human/animal/technical networked systems that are both research platforms and, more importantly, working examples of global coordination and problem solving.

ITI's research focus will be on developing techniques and technologies that:

1. Investigate how nature and communities are affected by - and technologies that can empower them to confront - natural, political, and economic global pressures - in particular supporting the transition to reliable, sustainable and competitive energy systems. This will lead to a climate change resilient economy and society and help to explore the opportunities related to aquatic living and marine research and bio-based industries for the blue economy;

2. Invent new design techniques to best respond to, or shepherd, complex and interrelated natural, social, and cultural global issues - that could help repositioning Europe in a changing world through new ideas, strategies and governance structures that integrate and inspire the younger and more creative generations leveraging Europe's cultural heritage to build a more inclusive, innovative and reflexive society;

3. Develop personal, business, scientific, and civic technological platforms for better understanding and situating actions, choices, and self in a global perspective - enabling the transition towards a green economy and society through eco-innovation and developing comprehensive and sustained global environmental observation and information systems.

ITI develops a unique research infrastructure that leverages the identification and demonstration of breakthrough research and design situated outside of global centers, including active research in, and with, the global south for which Lisbon, as the only European Atlantic capital, and Madeira an historic outposts for transnational EU cooperation, are well positioned. This research infrastructure will enable exploration of Future Coastal Urban Environments which have a particular relationship with the oceans by advancing sensing, communication, tracking and monitoring solutions to increase our understanding of the underlying resources and ecosystems. This test bed will explore the potential of healthy marine ecosystems to provide a range of services with high potential social and economic benefits for the blue economy. The test bed will focus on building a symbiotic relationship between cyber-physical and ecological systems thus becoming a platform for scientific collaboration between researchers interested in biodiversity, climate change, engineering, material science and design.

# Statement of the President

**Nuno Nunes**
President of ITI

Interactive Technologies Institute (ITI) is one of the leading research centers in Portugal focusing on human-computer interaction and design innovation. ITI is a non-profit innovation institute emerging from the association of the University of Madeira, the Regional Government of Madeira and Carnegie Mellon University. It is located in the Autonomous Region of Madeira, an outermost region of Europe. ITI was conceived in 2000, formally integrated as a research group in 2007, and established as an Innovation Institute in 2010. ITI has also been a member of the national Laboratory of Robotics and Engineering Systems (LARSyS) since 2011. ITI's mission is to research, enable, design and create transformative experiences that empower people to lead the best possible life in harmony with their environment.

The Interactive Technologies Institute (ITI) is one of the leading research centers in Portugal focusing on human-computer interaction and design innovation. ITI was conceived in 2000, formally integrated as a research group in 2007, and established as one of the research units of the national Laboratory of Robotics and Engineering Systems (LARSyS) since 2011. ITI's vision is to become a world class research center for human-centred design and technology, creating socio-technical systems suited for global challenges.

Our strategic priority was always to attract the best talent to Portugal, from students to junior and senior faculty that could help make ITI an excellence center in HCI research and design-driven innovation. In 2018, ITI is currently associated with 40 integrated members, 47 Ph.D. students totaling around 100 researchers, supported by a dedicated group of four staff members. This vibrant and enthusiastic community comes from 14 different nationalities from four continents. We welcome these people recognizing that excellence can only be achieved if you attract and retain the best.

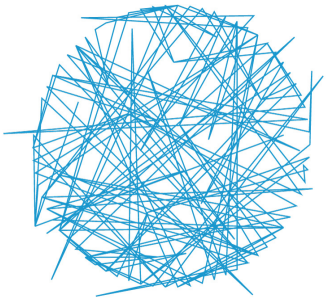
We are pleased to highlight some of ITI's accomplishments in the last years. In July 2017 we held the external Advisory Board meeting, which was again a fruitful experience. The Advisory Board recommended that ITI continues the orientation towards becoming a center of design for global change with local relevance related to the unique geo-political positioning of Portugal. The Advisory Board also recommended a shift from a discipline-oriented focus (in HCI) to a more problem-based orientation with reference to selected themes that reflect the skills of the existing research staff. Finally, the Board recommend that ITI evaluates courses of action related to the governance model in particular considering a stronger connection with LARSyS and IST–U. Lisbon.

These are all important challenges for a small research institution such as ITI, awaiting the FCT evaluation results of 2017/18 and many regulatory changes in Portugal for scientific employment of research track faculty. The Portuguese Government is committed to increase the opportunities for scientific employment in Portugal and to move from a scholarship model of post-doctoral grants into a work contract model, which increases the responsibilities of the research institutions such as ITI to sustain and retain talented staff. Notwithstanding, the last years provided records in terms of our research projects portfolio. The yearly budget surpassed 2M€ of competitive funding and several Horizon 2020 and other European funded projects were granted.

2019 marks a new stage in the development of our institute. Following the advice of our advisory board ITI is transforming into a multi-institutional context with a stronger connection with IST and the Fine Arts School of the U. Lisbon while retaining a strong presence in Madeira where it was conceived. ITI is unique in the Portuguese landscape of research units bridging engineering to design, social sciences and humanities and the arts. Our new positioning will enable this scientific project to strenghten and expand within LARSyS.

# LARSyS

## Associate Laboratory of Robotics and Engineering Systems



LARSyS' ultimate goal is to be actively involved in a new generation of questions and advanced training in Robotics and Engineering Systems, leading to new frontiers of knowledge and the training of skilled human resources at the best international level. Our researchers aim to create and develop new knowledge bases with impact in ocean, urban, aeronautics and space, biomedical, and future working environments, as well as to stimulate new industry-science relations and deepen our understanding of network science.
To achieve this strategy and vision, LARSyS supports its activities in the competences available in its four research centers (i.e., ISR, IN+, MARETEC, and ITI). These centers provide specific areas of expertise in their main domains of knowledge through ten Laboratories and/or Groups, affiliating researchers that conduct specialized work in their main fields of expertise at an international level of excellence. Overall, they provide the necessary knowledge and experience to foster LARSyS scientific program.
On the top of that structure, the strategy of LARSyS is promoted and implemented through six Thematic Areas. They aim to explore new frontiers of knowledge driven by needs and markets as we envisage them today, making use of target objectives and linkages with end-users. They consider emerging themes under, on, above, in and beyond our daily human live.
Each Thematic Area has been defined together with a main target in a time horizon of 15 years (2030), without prejudice of involving other projects. They include five Areas of Application-driven Research and one area of Fundamentals. They provide a matrix-based form for the organization of LARSyS, facilitating networks of researchers from the various centers and groups to foster the exchange of ideas across disciplines and the exploration of new frontiers of knowledge in emerging themes.

The five Thematic Areas of Application-driven Research are as follows:

- OCEAN EXPLORATION and EXPLOITATION, relying on competences and human resources of DSORg (ISR), MARETEC, LTPM (IN+) and ITI.
- URBAN SYSTEMS, relying on competences and human resources of SIPg (ISR), MARETEC, LIES (IN+) and ITI.
- AERONAUTIC and SPACE SYSTEMS, relying on competences and human resources of IRSg and DSORg (ISR), MARETEC, LTCES and LTPM (IN+) and ITI.
- ENGINEERING FOR AND FROM THE LIFE SCIENCES, relying on competences and human resources of SIPg, IRSg, LASEEBg and VISLAB (ISR), LTCES and LTPM (IN+) and ITI.
- COGNITIVE ROBOTS AND SYSTEMS FOR ASSISTED LIVING AND WORKING, relying on competences and human resources of VISLAB and IRSg (ISR), LTPM (IN+) and ITI.

The Thematic Area of Fundamentals consider formal and informal networks of researchers, from various centers, aimed to explore new frontiers of knowledge in themes without any specific known application. They consider basic knowledge beyond our current applications. It is named as follows:

Distributed Information Processing and Decision Making, relying on competences and human resources of SIPg (ISR), DSORg, IRSg (ISR), MARETEC, LTPM (IN+) and ITI.
The key thrust of LARSyS activity will be threefold: research, advanced training, and outreach activities, including public service. For research and advanced training, LARSyS complements its internal multidisciplinary with external cooperation by networking with highly reputed research and academic institutions and industrial partners worldwide. To this effect, impetus will be given to the exchange of scientific personnel, participation in international projects, and hiring of exceptional PhD students and senior researchers. Spe cial attention is given to the organization of summer schools and research internships.

Advanced training initiatives are at the center of LARSyS at the best international level and involve several international partnerships, as follows:

- MIT-Portugal Program, through its overall coordination and an active involvement of researchers in the areas of Sustainable Energy Systems (SES) and Engineering Design and Advanced Manufacturing (EDAM);

- Carnegie Mellon Portugal Program, through an active involvement of researchers in the areas of Electrical and Computer Engineering (ECE), Computer Science (CS), Human Computer Interaction (HCI) and Engineering and Public Policy (EPP);

- IST EPFL Program, Joint Doctoral Initiative in the area of Distributed and Cognitive Robotics involving Instituto Superior Técnico and École Politechnique Federal de Lausanne (EFPL).

- IRGC, International Risk Governance Council, through the coordination of IRGC-Portugal, which involves five Associate Laboratories in Portugal Outreach activities, including public service, is foreseen as one of the missions of LARSyS.

This takes the form of collaboration with public administration bodies, including governmental departments and local administrations, as well as with ONGs and, above all, basic and secondary schools and science centers.

Our target is to enhance collaboration with a diversified range of stakeholders to foster the dissemination of scientific knowledge and culture to the public at large. This has been particularly achieved by a strong involvement of LARSyS over the years in the Portuguese Ciência Viva program.
To achieve all these goals, the managing structure of LARSyS considers three complementing approaches: i) bottom-up; ii) middle-out; and iii) top-down.
The bottom-up nature of LARSyS is promoted through its Scientific Council, which includes all doctorate researchers. It is aimed to examine and approve the annual plans and reports, and to define the Governance structure of LARSyS. It meets twice a year.
The middle-out managing structure of LARSyS is promoted through each of the ten Research Groups/Laboratories and the six Thematic Areas. Each of the ten groups has a Principal Investigator (PI), and each of the six Thematic Areas has a PI and a Management Committee.
In addition, the necessary top-down management of LARSyS is used for overall coordination. It lies on a coordinating Board of Directors with the responsibility of supervising and guiding the activities of the four participating R&D units. This Board is composed by the directors of the four R&D units involved and by the PIs of the ten Thematic Areas. The President of the Board of LARSyS coordinates the Board of Directors and is elected among its members. A small Executive Board, including the directors of the four R&D units involved, supports the President for the daily management of the activities resulting from the collaboration among the participant units and to guarantee its accurate fulfilment.

The activities of the LARSyS are followed yearly by an External Advisory and Review Board, consisting of national and international experts, as established by decision of the Scientific Council.


LARSyS
Laboratory of Robotics
and Engineering Systems


UNIVERSIDADE da MADEIRA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LISBOA


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# Research Team

P President

VP Vice-Presidents

SC Scientific Committee

The researchers of ITI organize themselves in research groups by scientific affinity and through association with funded research projects. Each research group has a leader (Principal Investigator), who is either the main person responsible for the funded project, or who is appointed to the role by senior members of the institute to cover specific research areas of direct interest to ITI.

### Arminda Lopes
Research Fellow

Ph.D. from Leeds Metropolitan University, U.K, currently a professor at Polytechnic Institute of Castelo Branco and her main research area is Human Computer Interaction, Research Methods Methodologies.

### Augusto Esteves
Assistant Professor

Ph.D. in Informatics Engineering (HCI) from the U. of Madeira. He leads the HCI laboratory at Edinburgh Napier University with focus on the design and development of systems that improve the user experience (UX) with smart environments and devices (IoT).

### Bongkeum Jeong
Postdoctoral Research Fellow

Ph.D. in Design Policy, Hongik University, Seoul. Post-Doc Researcher in Design & HCI, Carnegie Mellon University, Pittsburgh. Current interests lie in Policy Design for Value Added Enhancement of Visual Content Industry.

### Bruna Gouveia
Assistant Professor

Ph.D. in Nursing Sciences at the University of Porto, Biomedical Sciences Institute. Bruna is adjunct Professor at the Saint Joseph of Cluny Higher School of Nursing, Portugal; Director of the Rehabilitation Nursing Specialization Course; Coordinator of the Research Office.

### Catia Prandi
Postdoctoral Research Fellow

Ph.D. Degree from University of Bologna with the thesis titled "Participatory Sensing and Crowdsourcing in Urban Environment". Since 2017 she is working as post-doc fellow at ITI, and as post-doc researcher in the H2020 CiViTAS Destinations project.

### Cláudia Silva
Postdoctoral Research Fellow

Ph.D. in Digital Media from the NOVA University of Lisbon within the context of the UT Austin-Portugal doctoral program. In 2016, Cláudia joined the Beanstalk team to work on a transmedia storytelling project.

### Deborah Castro Mariño
Postdoctoral Research Fellow

Ph.D. in Communication Studies from Autonomous University of Barcelona. Her main research interests lie in the fields of television studies, digital media, and transmedia storytelling.


### Diogo Cabral
Assistant Professor

Ph.D. in Computer Science from NOVA University of Lisbon (UNL). Focused on developing creativity support tools and interactions that foster and augment creativity for knowledge workers and artists, crossing Multimedia and HCI fields.

### Elisa Bertolotti
Assistant Professor

Elisa is a multimedia researcher and practitioner who has graduated in Communication Design at the Politecnico di Milano. She co-leads an ongoing collaboration with the Imagis research group (Design Dept., Politecnico di Milano, Italy) and with DESIS network. She is currently an assistant professor at the Art & Design Department, University of Madeira.


### Élvio Gouveia
Assistant Professor

Ph.D. in Sport Sciences from the University of Madeira, with thesis topic on Aging, Body Composition, Physical Activity and Functional Fitness. Rúbio is an Assistant Professor, Department of Physical Education and Sports, University of Madeira.

### Filipe Quintal
Postdoctoral Research Fellow

Ph.D. from the University of Madeira (Exploring the dimensions of eco-feedback in the wild). Main research interest in eco-feedback, energy, sustainability and how all these fields interaction with the IoT movement.

### Frederica Gonçalves
Assistant Professor

Ph.D. in Computer and Software Engineering, specialty in Human Computer Interaction. She is an Assistant Professor at UMa. The main thread of her research is designing new ways for people to have an easier access to reading and writing with novel tools or user interfaces (Creativity Support Tools and HCI).

### James Auger
Associate Professor

Ph.D. in Design from the Royal College of Art (UK), Auger is a designer, researcher and lecturer whose work examines the social, cultural and personal impact of technology and the products that exist as a result of its development and application.

### Johannes Schoening
Affiliated Full Professor

He's a Lichtenberg Professor and Professor of Human-Computer Interaction (HCI) at the University of Bremen in Germany. co-director of the Bremen Spatial Cognition Center (BSCC) and member of the TZI. His research interests lie at the intersection between (HCI), geographic information science and ubiquitous interface technologies.

### José Luís Silva
Assistant Professor

Ph.D. in Computer Science from the Portuguese MAP-i Consortium (University of Minho, U. of Aveiro and U. of Porto) and post-doc at the U.of Toulouse. His main research interests lie upon Software Engineering, Human-Computer Interaction, Ubiquitous Computing and Virtual Environments.

José Nocera
Affiliate Associate Professor

Ph.D. in Computing from The Open University, UK. Chair for UNESCO IFIP TC 13.8 working group in Interaction Design for International Development as well as Chair for the British Computer Society Sociotechnical Specialist Group. His interests lie in the sociotechnical and cultural aspects of systems design, development and use.

Julian Hanna
Assistant Professor

Ph.D. in English Literature from University of Glasgow. With interests in literature and technology, digital humanities, islands and futures studies.

Karolina Baras
Assistant Professor

Ph.D. in Technologies and Information Systems from University of Minho. Her research interests are ubiquitous computing, sensing well-being and Internet of things.

Lucas Pereira
Research Fellow

Ph.D. in Computer Science from U. Madeira. Interests lie in the multi-disciplinary field of data science, including machine-learning, and intelligent user interfaces. Co-founded prsma.com, a ITI spin-off in sustainable energy R&D.

Luísa Soares
Assistant Professor

Ph.D. in Psychology from Universitat Ramon Llull. Assistant Professor of Psychology at University of Madeira, Center of Arts and Humanties. Researcher at University of Porto, Psychology Research Center.

Marko Radeta
Research Fellow

Ph.D. in Design from Milan Politecnic. Current interests lie in augmented and mixed reality and ocean and biodiversity sensing and citizen science.

Mary Barreto
Postdoctoral Research Fellow

Ph.D. in Human-Computer Interaction from the University of Madeira. Conducts postdoctoral research studies in the following areas environmental sustainability, energy, eco-feedback, behavior change and community psychology.

Mónica Cameirão
Assistant Professor

Ph.D. in Information Technologies and Audiovisual Media. Research on the development and clinical assessment of interactive technologies for neurorehabilitation and fitness. 2016 awardee of the ISVR Early Career Investigator Award.


Mónica Mendes
Assistant Professor

Ph.D. in Digital Media from New U. Lisbon/UT Austin|Portugal Program. Assistant professor at U. Lisbon, designer and media artist focused in art and interactivity for environmental sustainability.


### Morgado Dias
Assistant Professor

Ph.D. in Electrical Engineering from University of Aveiro. Current research interests are: Artificial Neural Networks, Field Programmable Gate Arrays, Sleep Monitoring and Renewable Energy.
Director of the Ph.D. program in Automation and Instrumentation.

### Nuno Correia
Assistant Professor

Researcher, artist and designer. Interested in interactive multi-sensorial experiences. Ph.D. in new media from Aalto University. Since 2000, he has been teaching and conducting research in Portugal, Finland, Estonia and the UK. As artist, he has presented work in more than 20 countries.


### Nuno Nunes
Full Professor

Habilitation and Ph.D. in Computer Science from University of Porto and University of Madeira. Nuno's research interests lie in the application of models to software, system and service design in particular for the domains of environmental sustainability and participatory culture.

### Nuno Otero
Associate Professor

Nuno holds a Ph.D. from Sussex University in the UK and he is an associate professor at LNU CeLeKT and a Research Fellow at the Department of Information Systems at University of Minho in Portugal. He is interested on theories and conceptual frameworks in HCI, from more traditional approaches taking a user centred perspective to more recent trends focusing on user's experiences with technologies.

### Patrícia Gouveia
Associate Professor

Patrícia Gouveia is an Associate Professor and New Media Art Department Director at the Fine Arts Faculty at Lisbon University. She works in Multimedia Arts and Design since the nineties. Her research focus on playable media, interactive fiction and digital arts as a place of convergence between cinema, music, games, arts and design.


### Pedro Campos
Associate Professor

Ph.D. in Human-Computer Interaction, from the University of Madeira, Habilitation in Informatics from the University of Aveiro. Research interests lie upon Persuasive Computing, Cognitive Augmentation, Interaction Design, Augmented Reality, Agile Software Development Methods, Interaction Design Tools.

### Pedro Oliveira
Research Fellow

Ph.D. in the Human Sciences (Brunel University, London).
With extensive experience in Portugal and the UK (Tavistock/ WLMHT).

### Pedro Valente
Assistant Professor

Ph.D. in Informatics Engineering from UMa. Currently a Software Specialist and a pro-bono lecturer in UMa. Main research interests rely on the development and integration of software engineering, human-computer interaction and enterprise engineering.

### Sabrina Scuri
Postdoctoral Research Fellow

Sabrina is a postdoctoral research fellow at ITI, where she is working on the H2020 Smart Islands Energy System (SMILE) project. In 2017 she completed her Ph.D. in Design at Politecnico di Milano.

Sergi Bermúdez
Associate Professor

Ph.D. from the Swiss Federal Institute of Technology Zürich (ETHZ). Main research interests lies in neuro-rehabilitation systems, interactive technologies and robots.

Shujoy Chakraborty
Assistant Professor

Ph.D. in Design from Politecnico Di Milano. Currently teaches courses in design for interactive media, design for pleasurable user experiences, theory and process of design, product development, form studies, modeling techniques, product design drawing, and 3D printing in UMa.


Simone Ashby
Assistant Professor

Ph.D. in Computer Science and Informatics from University College Dublin. Main research interests lies in Mobile-based speech and language technologies for development (SLT4D), computational phonology, acoustic phonetics, speech synthesis, adaptive speech.

Sónia Matos
Assistant Professor

Ph.D. from Goldsmiths College, University of London (U.K). Currently an Associate Research Faculty at ITI as well as a lecturer at the School of Design, University of Edinburgh. Her main research areas are Interface Design and User Experience.

Sónia Rafael
Assistant Professor

Ph.D. in Communication Design from Fine Arts Faculty at Lisbon University. She's a researcher at the Center of Research and Studies of Fine Arts Faculty at Lisbon University. Her research interests include Communication Design, Interaction Design, Digital Arts, New Media, Culture and Technology.


Valentina Nisi
Assistant Professor

Ph.D. in Interactive Location Based Narrative from Trinity College, Dublin. Research focuses on designing and producing digitally mediated experiences in real spaces, merging architecture, context and landscape.

Valentina Vezzani
Assistant Professor

Ph.D. in Design, achieved in Politecnico di Milano. Assistant Professor at the Department of Art & Design, Faculty of Arts and Humanities, University of Madeira, and Programme Leader for the BA in Design. She isinterested in investigating the role of Design when about nature conservation and biodiversity.

# Institutional Staff

Alexandra Mendes
Academic & HR Coordinator

Alexandra joined the Institute in February 2016 as an administrative assistant. In 2017 she started working as M-ITI's academic coordinator assisting the Masters (MHCI) and Ph.D. programs (DEI, PDMD, NETSYS).

Cátia Jardim
Project Manager

Cátia joined the Institute in January 2014. As PM her role includes ensuring the projects are carried out in line with the work plan and budget, in compliance with the funding entity rules and regulations; preparation of technical and administrative reports and deliverables; liaison with project consortium and funding entities and support in grant writing.

Deise Faria
Project Manager

Deise joined ITI in December 2014. As PM, her main responsibilities are the complete management of the project in close cooperation with the Principal Investigator; project progress monitoring; administration of project resources including budget-related issues; elaboration and processing financial reports; Close communication with funding entities.

Elsa Ferreira
Communication Manager

Elsa joined the Institute in February 2016 as a project assistant working directly for the ERA Chair project. She's currently ITI's Communication Manager. Her role includes managing the social communication and organizing events and visits.

Harry Vasanth
System Administrator

After working as a research assistant since 2016, Harry joined the institution as the System and Network Administrator in 2017. He is in charge of the maintenance, development and integrity of ITI's network & system infrastructure.

# Strategic Ambitions

The researchers of ITI organize themselves in research groups by scientific affinity and through association with funded research projects. Each research group has a leader (Principal Investigator), who is either the main person responsible for the funded project, or who is appointed to the role by senior members of the institute to cover specific research areas of direct interest to ITI.

### Research Capacity

Establish ITI as an active player in the European Research Area by building an experienced partnering network of European excellence centers that will assist in strengthening our research capacity through know-how exchange, infrastructure setup, EU funding access and brain-drain prevention.

### Strategic Planning

Focus ITI research strategy in key application domains that correspond to important societal challenges aligned with the ERA strategic planning: entertainment and assistive technologies, creative media and digital culture, and sustainability for smart cities.

### Human Resources

Reach distinctive and critical human capital in interactive technologies by overcoming the fragmentation of competences (typically driven by academic and not research requirements) that is currently straining ITI's existing human resources.

### Intellectual Property

Substantially improve the RTD indicators and contribute to changing the economic and development paradigm, which is presently under pressure recovering from the financial crisis.

### Networking

Overcome the brain drain by recruiting high quality experienced researchers, engineers and established scientists, and promoting free exchange of knowledge and people within and across the partner network.

### Startups and Spin-Offs

Boost the potential of ITI to generate innovative ideas that can be turned into new marketable interactive systems and services through the attraction of industry and the generation of startups and spin-offs.

### Critical Design and Critical Making

Improve the innovation performance by creating a unique research infrastructure based on an open innovation model that leverages an international living lab for testing innovative interactive technologies and their social impacts.

### Development Paradigm

Enhance the use of generated knowledge through instituting an effective strategy for managing intellectual property.

# SWOT Analysis

A SWOT analysis portrays ITI's aim to develop a single strong focus that can be communicated as an umbrella vision stating a research agenda to which all members of the institute can contribute and collaborate in more group-oriented projects, the focus and vision exploit the specific characteristics of Madeira being an island and the local geographical expertise.

S

## Strengths

- High potential research faculty
- Institutional support and strategic alignment
- International connections and high-quality graduate education
- Attractiveness and high quality of life in Portugal
- Cooperation with industry
- Strong leadership
- Alignment with Regional and National S3

## Weaknesses

- Limited participation in the ERA
- Lack of research management structure
- Low critical mass
- Lack of in-house and large scale deployment equipment
- Insufficient laboratory space

W

O

## Opportunities

- Increased importance of HCI and design innovation in ICT
- Increased relevance for ERA ICT challenges
- Agility and empowerment of young research team
- Industry demand for design thinking
- Lower costs of research and availability of talent
- Increasing entrepreneurship mindset of our Researchers

## Threats

- Brain drain
- Competition to hire talented researchers
- Dependency from National research funds
- Internal resistance
- Lack of career development opportunities

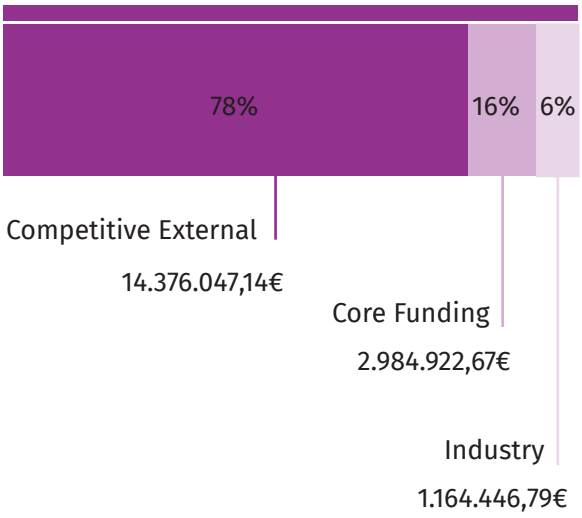
T

# Funding Sources

## 2010 - 2019

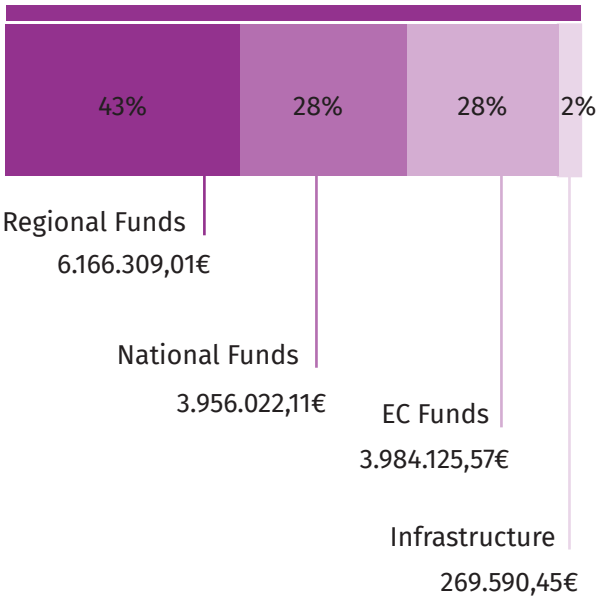
TOTAL EXPENDITURE

18.525.416,60€




COMPETITIVE EXTERNAL FUNDS

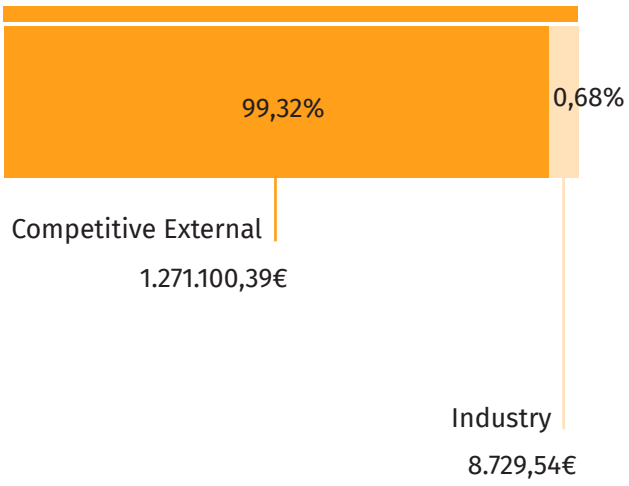
14.376.047,14€




## For 2019

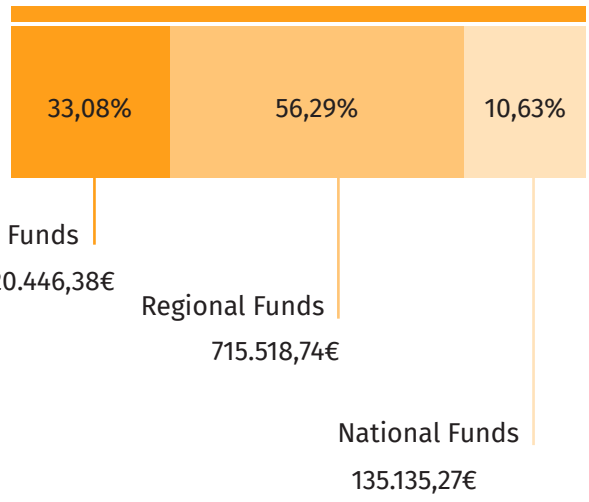
TOTAL EXPENDITURE

1.279.829,93€




COMPETITIVE EXTERNAL FUNDS

1.271.100,39€



# Fostering Research

Currently ITI is involved in 19 research projects involving a total funding of 1.279.829,93€. Our current project portfolio spans the areas of neuro-rehabilitation, energy, digital culture and human-robot interaction.

## ITI in numbers 2014-2019

**2488**

Total number of citations

**44**

Research Projects in which ITI has been involved

**622**

Research publications (Google Scholar)

**280**

Researchers in Projects

## ITI numbers evolution 2014-2019

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|
| Citations (from Google Scholar) | 1232 | 1306 | 1086 | 2258 | 2227 | 2362 | 2488 |
| Active Funded Projects | 15 | 14 | 13 | 10 | 19 | 18 | 19 |

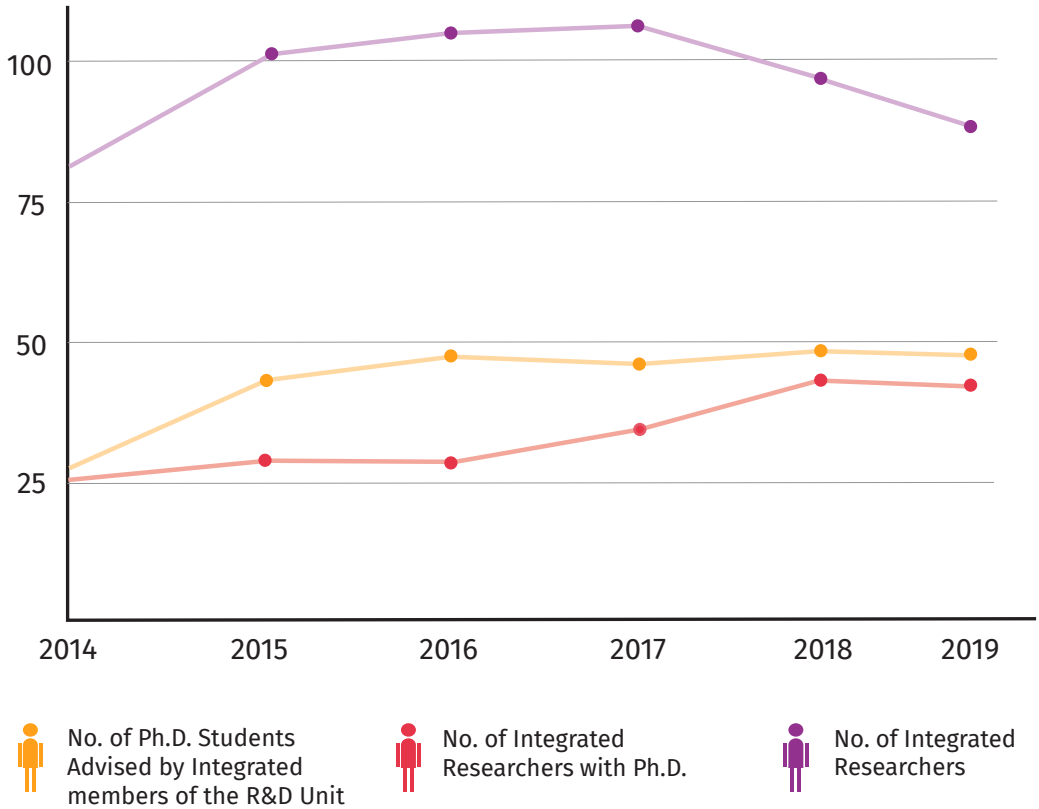
## ITI projects 2014-2019

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|
| No. of Research contracts with national public or Private Entities | 14 | 21 | 15 | 22 | 29 | 12 | 113 |
| No. of Research Contracts with International Bodies | 1 | 6 | 4 | 10 | 13 | 7 | 41 |

# ITI Researchers and Students in LARSyS

| Researchers and Students | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|
| No. of Integrated Researchers | 82 | 103 | 111 | 114 | 97 | 97 | 594 |
| No. of Integrated Researchers with Ph.D. | 25 | 27 | 27 | 31 | 40 | 40 | 160 |
| No. of Ph.D. Students Advised by Integrated members of the R&D Unit | 26 | 40 | 46 | 44 | 47 | 48 | 203 |
| No. of Researchers (Post-Doc grants) | - | - | 8 | 12 | 13 | 9 | 42 |
| No. of Researchers with Ph.D. (contracts) | - | - | 5 | 5 | 6 | 6 | 22 |

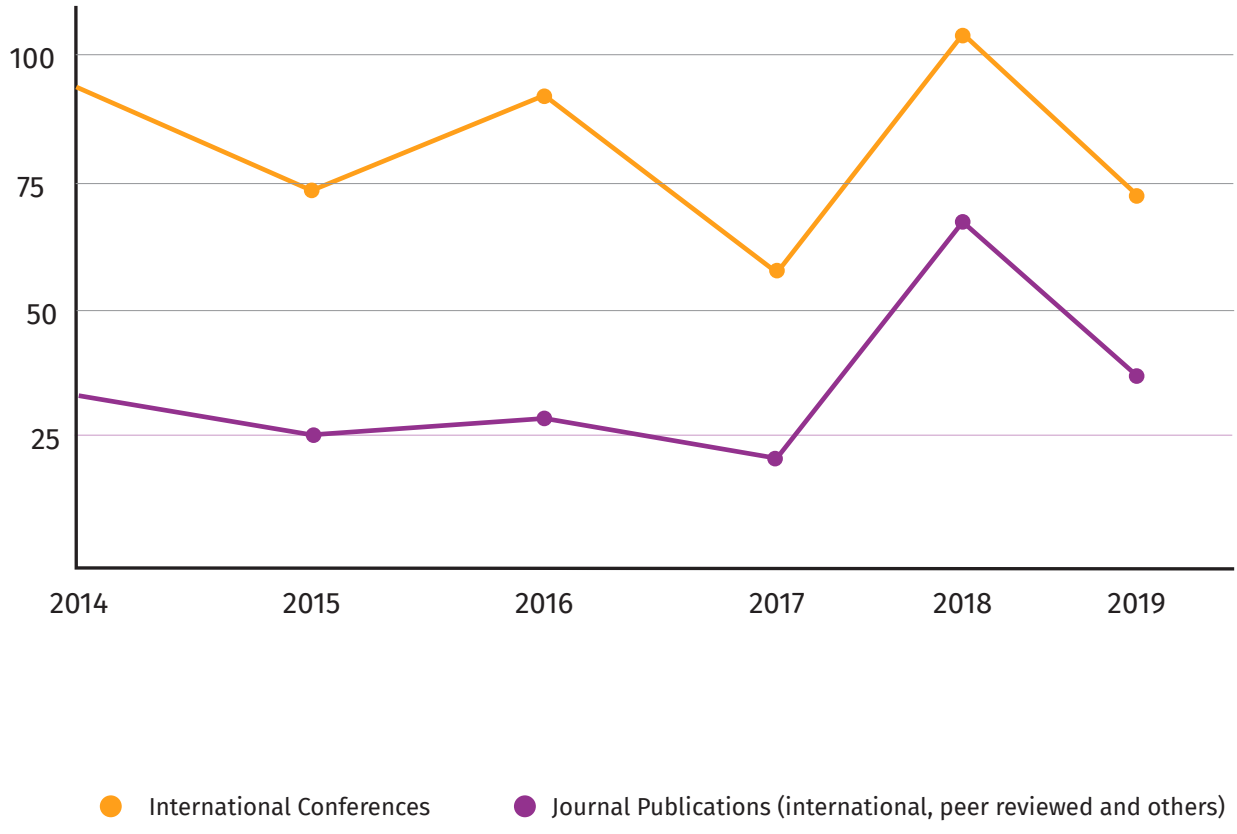
## ITI Human Resources



# ITI Publications and Ph.D. Thesis

| Indicators | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|
| Journal Publications (international, peer reviewed and others) | 31 | 25 | 26 | 22 | 65 | 40 | 209 |
| Ph.D. Thesis Awarded (total) | 2 | 3 | 3 | 2 | 2 | 1 | 13 |
| Ph.D. Thesis Awarded in Partnerhips with International Institutions (CMU, MIT and others) | - | 1 | 1 | - | - | - | 2 |
| International Conferences | 88 | 73 | 85 | 61 | 102 | 87 | 496 |

## ITI Publications



# KPIs of LARSyS

| Indicator | LARSyS | ITI | QUOTA |
|---|---|---|---|
| Integrated Researchers with a Ph.D. | 126 | 31 | 25% |
| Ph.D. Students | 138 | 44 | 32% |
| Researchers | 399 | 114 | 29% |
| **Funding** | | | |
| Overall Funding 2013-2017 | 34,8M€ | 7,51M€ | 22% |
| International Funding | 33% | 27% | - |
| DCT Institutional Funding | 20% | 15% | - |
| ROIs | x5 | x6,7 | - |
| **Doctoral Training** | | | |
| Ph.D. Thesis Awarded in 2013-2017 | 119 | 12 | 10% |
| **Publications** | | | |
| Journal Papers 2013-2017 | 862 | 127 | 15% |
| Conference Papers 2013-2017 | 1439 | 409 | 28% |
| **Scientific Employment** | | | |
| Hired Research Track Faculty | 18 | 5 | 28% |
| Post-Docs | 45 | 12 | 27% |
| Total Ph.D. Hired | 63 | 17 | 27% |

# ITI Funding 2013-2019

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|
| **Fundação para Ciência e Tecnologia, I.P. - FCT** | 266.678€ | 127.876€ | 242.232€ | 327.169€ | 401.084€ | 415.635€ | | 1,780M€ |
| **R&D Unit Pluriannual Funding** | 11.668€ | 39.987€ | 186.594€ | 280.445€ | 364.557€ | 350.495€ | | 1,233M€ |
| **Project Funding** | 255.010€ | 87.889€ | 55.638€ | 46.724€ | 36.527€ | 65.139€ | | 546.927€ |
| **Other National Sources** | 494.423€ | 275.164€ | 334.510€ | 542.145€ | 959.597€ | 470.525€ | | 3,076M€ |
| **Public Sources** | 479.673€ | 245.964€ | 331.309€ | 530.937€ | 852.516€ | 440.667€ | | 2,881M€ |
| **Companies, Industry and other private sources based in Portugal** | 14.750€ | 29.200€ | 3.201€ | 11.208€ | 107.081€ | 29.858€ | | 195.298€ |
| **International Sources** | 33.416€ | 351.625€ | 445.663€ | 638.363€ | 563.397€ | 578.071€ | | 2,610M€ |
| **European Comission** | 21.401€ | 351.625€ | 437.034€ | 637.564€ | 501.297€ | 567.017€ | | 2,515M€ |
| **Companies; Industry and other private sources based in Portugal** | 12.015€ | 0€ | 8.629€ | 799€ | 62.100€ | 11.054€ | | 94.597€ |
| **Total** | **794.517€** | **754.665€** | **1,022M€** | **1,507M€** | **1,924M€** | **1,464M€** | | **7,467M€** |

# Impact cases

ITI generates a unique combination of strong research and innovation potential enabling interdisciplinary work among scientists and engineers in examining and communicating the impact of emerging technologies in key areas of contemporary life. Leveraging on design innovation, ITI is well positioned to generate novel products, systems and services these emerging technologies might support.

Prototypes and research demos function as tangible and accessible demonstrations that can be used to examine how contemporary scientific research could transform our lives in the near as well as distant futures. The potential of HCI to reshape the current interdisciplinary research landscape lies in a novel relationship between science and design used to support interdisciplinary work and foster dialogue with the population of users.

1

**Biodiversity Monitoring and Awareness**
The ourtermost regions of Europe (such us Madeira) host 80% of the biodiversity of Europe. Biodiversity monitoring and awareness are one of the major aspects in terms of research and impact in these regions. ITI is contributing to this strategic goal by implementing novel sensing and citizen science methods to understand, study and raise awareness about the biodiversity of species of Madeira Islands.

2

**Digitally Supported Participatory and Collaborative Welfare**
The project combines socio-economic research with the participatory design of digital technologies in order to promote the emergence of commonfare, intended as a new form of welfare model based on social collaboration. Commonfare has already interested thousands of people through the research activities , communication activities, and public events (with the participation/organization of 15 completed events and the future organization of other 22).

3

**Enabling Audiovisual User Interfaces for Multisensorial Interaction**
Enabling Audiovisual User Interfaces is a research project that investigated how human-computer interactions can be audiovisualized – that is to say, both sonified and visualized – in order to improve user experience and usability. To address this issue, a new UI (User Interface) paradigm was conceived – AVUI (AudioVisual User Interface).

4

**Energy Disaggregation and Novel Eco Feedback Approaches**
The work in this topic addresses the practical implications of deploying and long-term testing Non-Intrusive Load Monitoring (NILM) and novel eco-feedback approaches in real-world scenarios.

5 **Geographic HCI**
The research interests lie at the intersection between HCI, geographic information science (spatial cognition and spatial data) and ubiquitous and pervasive technologies to investigate how to provide users and communities with personalized map-based interfaces of the basis of the specific need and preferences.

6 **Human-Work Interaction Design**
The core agenda is to research sociotechnical and cultural aspects of interaction design, through a program of research aimed at supporting digital inclusion with people at the margins.

7 **Improving Aging and Quality of Life**
This research relies on the evidence that an independent lifestyle into the later years is associated to a person's functional fitness, in which balance and cognition have significant importance. Our studies have addressed these issues providing additional information about the aging process in older adults and supporting the development of i) feasible and safe programs focused in improving functional fitness/balance and cognition in independent-living older adults, incorporating also ICT; ii) solutions for the prototyping and development of assisted living systems.

8 **Interactive Technologies for Neurorehabilitation**
This research studies the intersection of technology, neuroscience and clinical practice to find novel solutions to increase the quality of life of those with special needs. Through three externally-funded projects that were capitalized on Virtual Reality, Serious Games and Brain-Computer Interfaces to exploit specific brain mechanisms that relate to functional recovery to approach motor and cognitive rehabilitation by means of non-invasive and low-cost technologies.

9 **Interactive Storytelling and Gaming**
This topic of research focuses on the design of digitally mediated interactive experiences, aiming at creating awareness and stimulating change towards societal challenges and pressing issues such as the preservation of natural and cultural patrimonies. From conception to prototyping and evaluation, the work unfolds across the domains of digital Interactive Storytelling, Gaming, and Entertainment, exploring the creation of novel experiences and evaluations paradigms for a wide variety of audiences.

10 **Physical and Digital Creativity Support Tools**
Physical and Digital CST at ITI has been focusing on creating digital tools for enhancing human processes of creativity and merging them with physical tools and artefacts. This has led to awarded products such as Delineato, Sense-seat and PlaceToWrite. Our results provide useful insights suggesting that olfactory cues have an important role in the creative process of users and even when this type of cues are combined with auditory cues.

11 **Reconstrained Design**
The Reconstrained Design Group was formed in 2016 to build on the advances made by critical and speculative design, but with the explicit aim of taking such approaches out of the gallery. The group has already influenced contemporary design practice and critical thinking about technology through exhibitions, festivals, conferences, workshops, and coverage in the media.

12 **Radio as a Service: low cost, highly connected, scalable FM radio micro- stations as a community information platform**
Radio is still an important medium in much of the world, more than a hundred years after its first commercial release. This work grows from the ERA Chair's prior work as founder and director of the MIT Center for Civic Media, based between the MIT Media Lab and the MIT Department of Comparative Media Studies. Under his leadership, Civic Media projects demonstrated new sustainable configurations of technology, labor, and community.

# Research Projects

# Beanstalk

**Tools to analyse trends in tourism and marketing complemented with transmedia experience**

Start: 2015 Finish: 2020

Beanstalk is a multidisciplinary project based at the Madeira Interactive Technologies Institute, in partnership with the Associação de Promoção da Madeira (AP Madeira). Our goal is to design and prototype new analytics tools to analyse Madeiran trends in tourism and marketing and further complement this with a transmedia experience that can potentially stimulate local economy.

This project is divided into two components – the first of which focuses on the creation of a platform where it is possible to keep track of the flow of people in Madeira. The second component consists in the development of a location based storytelling experience, using everyday mobile devices, that capitalizes on the previously collected data.

## Selected Publications & Exhibitions

Valentina Nisi, Mara Dionísio, Claudia Silva, and Nuno Jardim Nunes. 2019. A participatory platform supporting awareness and empathy building between tourists and locals: the Há-Vita case study. In Proceedings of the 13th Biannual Conference of the Italian SIGCHI Chapter: Designing the next interaction (CHItaly '19). Association for Computing Machinery, New York, NY, USA, Article 16, 1–10. DOI:https://doi.org/10.1145/3351995.3352049

Nisi V., Cesario V., Nunes N. (2019) Augmented Reality Museum's Gaming for Digital Natives: Haunted Encounters in the Carvalhal's Palace. In: van der Spek E., Göbel S., Do EL., Clua E., Baalsrud Hauge J. (eds) Entertainment Computing and Serious Games. ICEC-JCSG 2019. Lecture Notes in Computer Science, vol 11863. Springer, Cham

## Coordinators

Nuno Nunes,
Valentina Nisi

## Researchers

Ana Bettencourt,
Bongkeum Jeong,
Dan Brackenbury,
Dina Dionísio,
Dinarte Vasconcelos,
Duarte Teixeira,
Eduardo Gomes,
Mara Dionísio,
Marko Radeta,
Paulo Bala,
Rui Trindade,
Sandra Olim,
Vanessa Cesário

## Partners

Madeira Promotion Bureau (AP Madeira)

## Funded by

MADEIRA 14-20 FEDER
Madeira Promotion Bureau (AP Madeira)
2015/2016

## Budget

332.766,14€

http://beanstalk.m-iti.org/

# BRANT

**Belief Revision Applied to Neurorehabilitation Therapy**

Start: 2018 Finish: 2021

Cognitive deficits are common after brain injury, dementia and in normal cognitive decline due to aging. Current cognitive rehabilitation therapy has been shown to be the most effective way to address this problem. However, a) they are not adaptive for every patient and b) have a high cost, and is usually implemented in clinical environments. The Task Generator (TG) is a free tool for the generation of cognitive training tasks. However, TG is not designed to adapt and monitor the evolution of the patient. Here we propose BRaNT, an enhancement of TG with Artificial Intelligence modules, gamification and remote monitoring capabilities to enable Health Professionals to provide long-term personalized cognitive rehabilitation therapy at home. BRaNT is an interdisciplinary effort that addresses scientific limitations of current practices as well as provides solutions towards the sustainability of health systems and contributes towards the improvement of quality of life of patients.

## Selected Publications & Exhibitions

Fermé, E., Simari, G.R. Introduction to the special issue on belief revision, argumentation, ontologies, and norms. Ann Math Artif Intell 87, 185–186 (2019). https://doi.org/10.1007/s10472-019-09674-2

## Coordinators

Eduardo Fermé,
Sergi Bermúdez,
Mónica Cameirão

## Researchers

Ana Lúcia Faria,
Teresa Paulino,
Yuri Almeida

## Partners

NOVA.ID.FCT,

University of Coimbra

## Funded by

FCT

## Budget

49.924,40€

# ENERMAC

Start: 2017 Finish: 2019

**Renewable Energy and Energy Efficiency for the Sustainable Development of Western Africa and Macaronesian islands**

The aim of this project is to develop actions that contribute to maximize the use of renewable and indigenous energy sources, to help reduce energy dependence and promote the sustainable development of the Macaronesian and West African islands, based on the following lines of action: Energy Planning, Rational Use of Energy and Analysis of Networks and Microgrids.

The creation of a network of excellence in the field of Renewable Energies and energy efficiency will be promoted, where the knowledge generated among the participating regions will be shared, fostering the training and exchange of the research staff, in order to multiply the impact of the acquired know-how. The collaboration between institutions in these regions will allow to advance in the solution of their energy problems.

## Coordinator

James Auger

## Researchers

Mohammed Ali,
Parakram Pyakurel

## Partners

Instituto Tecnológico de Canarias, S.A. (MB),

Agência Regional da Energia e Ambiente da Região Autónoma da Madeira,

Universidad de Las Palmas de Gran Canaria,

Universidad de La Laguna,

Colegio Oficial de Arquitectos de Gran Canaria,

Consejería de Economía, Industria, Comercio y Conocimiento del Gobierno de Canarias,

Direção Regional da Economia e Transportes,

Federación Canaria de Municipios,

Cabildo Insular de El Hierro,

Cabildo Insular de Lanzarote

## Funded by

Cooperation Program INTERREG V-A Espanha-Portugal MAC (Madeira-Açores-Canarias) 2014-2020

## Budget

122.968,19€

# ERASMUS SPECULATIVE DESIGN

**Educational Resource Toolkit (SpeculativeEDU)**

The main aim of this project is to strengthen speculative design education by collecting and exchanging existing knowledge and experience whilst developing new methods in this emerging design field. By creating a transnational strategic partnership, built on different contexts and experiences across Europe, it will create a framework for the exchange of ideas and approaches and develop a Toolkit of resources for speculative design education.

Through a range of speculative methods, designers re-think alternative products, systems and worlds. Through its imagination and radical approach, speculative design forces one to think – raises awareness, provokes action, initiates discussions and perhaps even offers some alternatives that are essential for the world of today, and more importantly, the world of tomorrow.

Main target audiences are educational institutions and Ph.D. and master students (also bachelor) which are interested in investigating relationships between people, society and technology.

Start: 2018 Finish: 2020

**Coordinators**

James Auger,
Julian Hanna

**Partners**

Goldsmiths' College,

Human Ecosystems Relazioni,

Edinburgh Napier University,

Institut za Transmedijski,

Dizajn - Zavod za Umetnisko Ustvarjanje

**Funded by**

Erasmus + Program

**Budget**

35.370,00€

# FEEDBOT

**A symbiotic autonomous robot for meal assistance to motion-impaired people**

Start: 2018 Finish: 2021

Nowadays, many people with Cerebral Palsy, Alzheimer's disease and other degenerative diseases do not have motor coordination to feed themselves autonomously. The goal of the Feedbot project is to develop a portable robot arm so that people with severe motor disabilities can eat independently. Existing solutions have preprogramed movements, requiring users to adapt to them. The proposed robot arm learns the behaviours of each user and adapts the movements during each meal. Its portability is also a very important feature since enables its daily use, at home or in the office, as well as in any restaurant, whether the user is alone or with others. This device will thus contribute to a great increase in the autonomy of people with motor disabilities.

## Selected Publications & Exhibitions

Lencastre, H., Calisto, F. M., Nunes, N. J., Candeias, A., Marques, M., Costeira, J. P., & Veloso, M. (2019). FeedBot: Feeding Users With Motion-Related Disabilities HCI Approach. Keep in Touch.

### Coordinator

Nuno Nunes

### Researchers

Francisco Calisto

### Partners

IST-ID

### Funded by

FCT CMU-Portugal

### Budget

24.125,00€

# FIELD GUIDE

**Interactive Mobile Tools for Based Local Learning**

Start: 2018 Finish: 2021

The Field Guide project aims to establish an improvement in the levels of scientific, conservation and environmental literacies amongst children and youth living in the Azorean archipelago. With one of the lowest school success rates in Portugal, this project will combine place-based learning and mobile technology to foster more active and meaningful learning experiences in the region. Through the design of a digital field guide in the form of a mobile application (app.), the project will offer a younger generation the opportunity to explore, learn about and monitor their immediate environment. Designed to interact with existing biodiversity web portals and their respective databases, the app. will use the power of context-aware technology to shape youth?s understanding of the natural world while raising awareness of one of Portugal's key oceanic insular ecosystems.

The project will comprise both mobile and context-aware technology to support users in the exploration of relevant information that is bound to specific species and locations in the park.

Directly involving students in the exploration of their immediate environment, the Field Guide project will connect a younger audience to key knowledge and concepts that are age appropriate. Building on the importance of developing a scientific curriculum that draws on recent pedagogical innovations, such as 'place- based learning', 'phenomenona-based learning' and 'project-based learning', the work that will be developed with local schools will also promote the use of information and communication technologies in the context of the Azorean public school system.

## Coordinators

Sónia Matos,
Simone Ashby

## Partners

Fundação Gaspar Frutuoso

## Funded by

FCT

## Budget

167.354,52€

# FUTURE INDUSTRIAL KITCHEN

**Future Industrial Kitchen Design: Innovation using IoT and Smart Active Technologies**

Start: 2018 Finish: 2019

## Coordinator

Shujoy Chakrarborty

## Researchers

Helena Barbosa,
Lucas Pereira,
Pedro Lourenço,
Ulisses Andrade,
Vanessa Barradas,
Vítor Aguiar

## Partners

FN Hotelaria,

IST

## Funded by

PROCiência - IDE

## Budget

200.025,36€

Design of Industrial Kitchen of the Future: Innovation with Internet of Things (IoT) and Active Intelligent Technologies / Desenho de Cozinhas Industriais do Futuro: Inovação com Internet das Coisas e Tecnologias Inteligentes Activas" is an IDE-RAM funded PRO-Ciência 2020 project. The project is an academic-industrial research action with the partnership of M-ITI, UMa (Master in Spatial Design), IST-Lisboa (Department of Bioengineering), FN Hotelaria SA (Madeiran industrial kitchen manufacturer).

This project is placed in the Portuguese luxury hotels and food preparation sector with the strategic aim to develop a next-generation Industrial Kitchen concept utilizing IoT enabled interactive technologies, optimized appliances arrangement, re-imagined spatial, lighting and equipment layouts to maximize the workflow efficiency and pleasurability of the operating staff. The inter-disciplinary Future Industrial Kitchen (FIK) research group formed around this project has specialists from Spatial Design, Interactive Media, Sensor Engineering, Architecture, Interaction Design, and Industrial Design scientific areas.

## Selected Publications & Exhibitions

Pereira, L., Aguiar, V., and Vasconcelos. F. (2019) Future Industrial Kitchen: Challenges and Opportunities. Proceedings of the 6th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys '19). Association for Computing Machinery, New York, NY, USA, 163–164. DOI:https://doi.org/10.1145/3360322.3360872

Fábio Vasconcelos, Vitor Aguiar, and Lucas Pereira. 2019. Ultrasonic waste monitoring in the future industrial kitchen: poster abstract. In Proceedings of the 17th Conference on Embedded Networked Sensor Systems (SenSys '19). Association for Computing Machinery, New York, NY, USA, 446–447. DOI:https://doi.org/10.1145/3356250.3361960

www.futurekitchen.m-iti.org/

# GRASSROOT WAVELENGTHS

**Highly Networked Grassroots Community Radio through a Scalable Digital Platform**

The Grassroot Wavelengths project will create a game changing network of inclusive digital platforms for citizen engagement, community deliberation, and the free flow of information within, into, and out of discrete geographic communities by piloting solutions for connected, inexpensive, community owned and operated radio across Europe. Our approach includes features of the Living Lab and Participatory Design methods for setting up stations and services and understanding the processes in which they will be used and appropriated, along with an emphasis on synthetic speech to support the curation of audio content, thus turning data into media. Building on the success of the existing RootIO platform – with its proven commons-oriented technology and catalytic capacities for promoting/ enabling collective awareness and action, participatory innovation, community resilience, and media pluralism – we will: 1) deploy and test a network of low-power community radio stations in Ireland, Portugal, and Romania; 2) work with community groups, journalists, and public good experts to develop a robust platform for expansion across Europe; 3) enhance use and accessibility of networked community radio through text-to-speech, community oriented programming applications, and other community-supported modes for contributing and managing content); and 4) work within the EU framework to establish a public support infrastructure for local ownership and revenue generation. Together, these four actions combine to form a robust and tested platform with a clear path to scaling and exploitation in Europe and beyond.

## Selected Publications & Exhibitions

Mariacristina Sciannamblo,Roberto Cibin,Petra Žišt, Christopher Csíkszentmíhalyi, MaurizioTeli(2019).Co-designing collaborative care work through ethnography. In: Travlou, P. and Ciolfi, L. (Eds.). Ethnographies of Collaborative Economies Conference Proceedings. University of Edinburgh, 25 October 2019. ISBN 978-1-912669-11-0. Paper No. 9

Roberto Cibin, Maurizio Teli, and Sarah Robinson. 2019. Institutioning and Community Radio. A comparative perspective. In Proceedings of the 9th International Conference on Communities &T '19). Association for Computing Machinery, New York, NY, USA, 143–154. DOI:https://doi.org/10.1145/3328320.3328392

https://grassrootsradio.eu/

Start: 2018 Finish: 2020

### Coordinators

Chris Csíkszentmihályi,
Simone Ashby,
Maurizio Teli

### Researchers

Roberto Cibin,
Kristen Scott

### Partners

ActiveWatch,
Adenorma,
AMARC Europe,
BIPG,
CEREPROC,
RootIO,
UCC,
MedAlert

### Funded by

H2020

### Budget

318.447,50€

# LARGESCALE

**Location-based Augmented Reality Gadgets and Environment-friendly Sightseeing of Cultural Attractions for Locals and Excursionists**

Start: 2018 Finish: 2021

LARGESCALE is a multidisciplinary project primarily motivated to intersect two areas of prior studies and measure: (a) tourist and travel mobility using sensor based data; (b) affective analysis of playful and learning experiences. Collected data inquiries will be used to: (1) observe, predict and impact tourist?s mobility patterns; (2) create novel tourism products as interactive experiences, Location-based Augmented Reality Gadgets (LARGs) and touristic routes; and (3) promote local crafts as tourism products of Madeira and Lisbon regions. These tourism products will be collected through wearable/mobile applications, using geolocalization and local sensors, and will serve to promote sustainable travel and well-being. LARGESCALE will use them to impact the tourism potential of portuguese regions through applied research, prototypes and development of LARGs as tourism products, intersecting Human-Computer Interaction (HCI), Engineering and Design.

## Selected Publications & Exhibitions

Radeta M., Ribeiro M., Vasconcelos D., Nunes N.J. (2019) LoRattle - An Exploratory Game with a Purpose Using LoRa and IoT. In: van der Spek E., Göbel S., Do EL., Clua E., Baalsrud Hauge J. (eds) Entertainment Computing and Serious Games. ICEC-JCSG 2019. Lecture Notes in Computer Science, vol 11863. Springer, Cham

Radeta M. et al. (2019) SeaMote - Interactive Remotely Operated Apparatus for Aquatic Expeditions. In: Lamas D., Loizides F., Nacke L., Petrie H., Winckler M., Zaphiris P. (eds) Human-Computer Interaction – INTERACT 2019. INTERACT 2019. Lecture Notes in Computer Science, vol 11748. Springer, Cham

## Coordinators

Nuno Nunes,
Valentina Nisi

## Researchers

Marko Radeta,
Louis Rodrigues,
Jorge Lopes

## Partner

IST-ID

## Funded by

FCT

## Budget

192.612,20€

# LEAPFROG

**Enhancing the Research and Innovation Potential of ITI through Human-Computer Interaction and Design Innovation**

Start: 2014 Finish: 2019

The goal of this project is to expand the research and innovation potential of the Madeira Interactive Technologies Institute (M-ITI) of the University of Madeira through the hiring of an ERA Chair in Human-Computer Interaction (HCI) and Design Innovation (DI). The LEAPFROG HCI-DI aims at unlocking the full potential of interdisciplinary research in interactive technologies, while strengthening innovation and knowledge transfer activities in close collaboration with local and global industrial partners and contributing to the smart specialization strategy of Madeira.

## Coordinators

Nuno Nunes,
Chris Csíkszentmihályi

## Researchers

James Auger,
Julian Hanna,
Maurizio Teli,
Vítor Aguiar,
Victor Azevedo,
Vitor Gomes,
Duarte Sousa

## Funded by

Fp7 Regpot ERACHAIRS 2013-1

## Budget

2,637,190,00€

http://erachair.m-iti.org

# MACBIOIDI

Start: 2017 Finish: 2020

**Promoting the cohesion of Macaronesian ORs through an ICT platform for biomedical R&ID**

The project addresses the development, transfer, private investment and global commercialization of medical technology. Clinical trials are essential, particularly for the clinical thermography product, which must demonstrate its diagnostic potential in terms of sensitivity and specificity according to the clinical applications that are posed. The introduction of products of training in the educational systems of the participating territories will open up options for the medical technology companies, and will be accompanied by an international investment and marketing strategy in which specialized entities will participate in their promotion, together with the companies which are interested. An infrastructure based on ICTs will allow the collaboration and sharing of resources of the participants, identifying excellent scientific and technological capacities potentially usable in medical technology and already existing in our regions.

## Coordinators

Sergi Bermúdez i Badia,
Mónica da Silva Cameirão

## Researchers

Fábio Pereira,
Rúben Ornelas
Yuri Almeida,
Athanasios Vourvopoulos,
Carolina Jorge,
Diego Mora

## Partners

Universidad de Las Palmas de Gran Canaria (MB,
Universidad de La Laguna,

Instituto de Astrofísica de Canarias,

Instituto Tecnológico de Canarias,

S.A., Hospital do Divino Espírito Santo de Ponta Delgada,

EPE

## Funded by

Cooperation Program INTERREG V-A Espanha-Portugal MAC (Madeira-Açores-Canarias) 2014-2020

## Budget

241.489,30€

https://goo.gl/y7XpHT

# MEMEX - Memories Experience

**MEMories and EXperiences for inclusive digital storytelling**

MEMEX is a RIA European H2020 Project promoting immigrants' intangible heritage and social cohesion through collaborative, heritage-management tools. The concept is to provide inclusive access to tangible and intangible cultural heritage and, at the same time, facilitate encounters, discussions, and interactions between communities at risk of social exclusion by welding together their fragmented experiences and memories into compelling and geolocalised storylines. The collected content will be digitalized and linked to the pre-existent European Cultural Heritage (CH) and deployed across three distinct pilots to analyze expectations from communities dislocated in three territories: i) migrant women in Barcelona (ES), communities from former colonies in Lisbon (PT) and priority neighborhoods in Paris (FR).

https://memexproject.eu/

Start: 2019 Finish: 2021

## Coordinators

Nuno Nunes
Valentina Nisi

## Researcher

Vanessa Cesário

## Partners

Fondazione Istituto Italiano di Tecnologia

Mapillary AB

Noho Limited

EY Advisory SPA

Michael Culture

Fundacio Interarts per a la cooperacio cultural internacional

ECCOM European Centre for Cultural Organisation and Management Association

Mapa das Ideias - Edições de publicações, Lda

## Funded by

Horizon 2020

## Budget

361.961,25€

# MITIEXCELL

**Improving MITI's Excellence in R&D and Leveraging International Partnerships**

Start: 2015 Finish: 2020

MITIExcell aims to improve ITI's capacity in research and technological development, expanding human potential and promoting a critical mass of researchers with interdisciplinary experience in human computer interaction (HCI) seeking to investigate and develop humanistic and technological innovative solutions, that take advantage of outermost geographical position of Madeira to promote justice social, environmental sustainability and motivation of communities by new technologies and social networks. It shall also work on tools to analyse trends in tourism and marketing, complemented with transmedia experience. The three years project will be leveraging international Partnerships with Carnegie Mellon University, University of Texas at Austin and University College London, in the R&D aspect.

## Coordinators

Nuno Nunes,
Valentina Nisi

## Researchers

Cláudia Silva,
Deborah Castro,
Gemma Rodrigues,
Harry Vasanth,
Julian Hanna,
Sónia Matos

## Partners

Carnegie Mellon University,

University of Texas at Austin,

University College London

## Funded by

Madeira 1420 (IDR)

## Budget

2.436.560,17€

## Selected Publications & Exhibitions

Valentina Nisi, Mara Dionísio, Claudia Silva, and Nuno Jardim Nunes. 2019. A participatory platform supporting awareness and empathy building between tourists and locals: the Há-Vita case study. In Proceedings of the 13th Biannual Conference of the Italian SIGCHI Chapter: Designing the next interaction (CHItaly '19). Association for Computing Machinery, New York, NY, USA, Article 16, 1–10. DOI: https://doi.org/10.1145/3351995.3352049

Dionisio M., Silva C., Nisi V. (2019) Fostering Interaction Between Locals and Visitors by Designing a Community-Based Tourism Platform on a Touristic Island. In: Lamas D., Loizides F., Nacke L., Petrie H., Winckler M., Zaphiris P. (eds) Human-Computer Interaction – INTERACT 2019. INTERACT 2019. Lecture Notes in Computer Science, vol 11747. Springer, Cham

Paulo Bala, Raul Masu, Valentina Nisi, and Nuno Nunes. 2019. "When the Elephant Trumps": A Comparative Study on Spatial Audio for Orientation in 360o Videos. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19). Association for Computing Machinery, New York, NY, USA, Paper 695, 1–13. DOI: https://doi.org/10.1145/3290605.3300925

https://www.m-iti.org/content/mitiexcell-improving-mitis-excellence-rd-and-leveraging-international

# MODI

**Moving Digits: Augmented Dance for Engaged Audience**

MODI aims to enhance audience understanding and engagement in contemporary dance performances, and to allow to experience dance in an augmented way (even after the performance). The project also aims to empower dancers, choreographers and technicians with further tools for expression, archival and analysis. The project is a partnership between Madeira Interactive Technologies Institute (M-ITI, Portugal – Lead Partner), Hochschule Düsseldorf (HSD, Germany) and Sõltumatu Tantsu Lava (STL, Estonia). Tanzhaus NRW (Germany) and University of Greenwich (UK) are associated partners. The project has a duration of 2 years.

To achieve these aims, we propose to use different digital techniques and artistic approaches to visualize information from dancers - specifically, physiological and movement information. On body, sensors will be used to retrieve physiological information from the dancers, such as muscular, cardio, and brain wave activity. In space, motion tracking will also capture dancer movement information from multiple perspectives.

Dancer information will be visualized and shown to the audience using Mixed Reality (MR) techniques - the information will be presented surrounding the dancer, following her/him, and enhancing his/her presence on stage. This visualization will be not only informative, but also artistic, integrating with the overall scenography approach. Sound will also be used to convey dancer information. This information will be accessible after the event via Virtual Reality (VR) visualization – for audiences and dance artists. We will develop these solutions with a participatory design perspective, in several events.

## Selected Publications & Exhibitions

Raul Masu, Nuno N. Correia, Stephan Jurgens, Ivana Druzetic, and William Primett. 2019. How do Dancers Want to Use Interactive Technology? Appropriation and Layers of Meaning Beyond Traditional Movement Mapping. In Proceedings of the 9th International Conference on Digital and Interactive Arts (ARTECH 2019). Association for Computing Machinery, New York, NY, USA, Article 53, 1–9. DOI: https://doi.org/10.1145/3359852.3359869

Masu, Raul & Bettega, Mela & Correia, Nuno & Romão, Teresa & Morreale, Fabio. (2019). ARCAA: a Framework to Analyse the Artefact Ecology in Computer Music Performance Digital Music Performance, Artefact Ecology, Design Framework. 10.1145/3359852.3359870.

https://movingdigits.eu/

Start: 2018 Finish: 2020

### Coordinator

Nuno Correia

### Researchers

Raul Masu

### Partners

Hochschule Düsseldorf - University of Applied Sciences,

Sõltumatu Tantsu Lava

### Funded by

Creative Europe - Culture Sub-programme, 2018 – Education, Audiovisual and Culture Executive Agency (EACEA) of the European Union

### Budget

133.333,33€

# NEUROAUGVR

Start: 2018 Finish: 2021

**Stroke Neurorehabilitation Augmented by Virtual Reality and EEG-neurofeedback: Neuroimaging-based Validation and Optimization**

This project combines the latest research findings for effective stroke rehabilitation together with novel biomedical systems for brain monitoring (EEG, fMRI) and VR biofeedback, providing simpler and effective neurorehabilitation solutions. The aim of this project is to develop a novel and more inclusive rehabilitation system with the use of novel ICT technologies, in order to overcome current limitations. This will be achieved by identifying the neural correlates of motor action during motor imagery through brain imaging (fMRI), and differences in brain activation with different training feedback protocols for formulating user-specific models that will be used later in neurofeedback rehabilitation sessions through immersive VR feedback. The socio-economic impact of such a system is significant, allowing for novel personalized and home-based eHealth solutions for all patients. Thus, also decreasing the financial burden in the national health system.

## Selected Publications & Exhibitions

D. A. B. Mora, S. Bermúdez i Badia, Y. Almeida and C. J. Vieira, “Inter- and Intra-Hemispheric EEG Connectivity in Healthy Subjects and Chronic Stroke Survivors,” 2019 International Conference on Virtual Rehabilitation (ICVR), Tel Aviv, Israel, 2019, pp. 1-6.

Min Hun Lee, Daniel P. Siewiorek, Asim Smailagic, Alexandre Bernardino, and Sergi Bermúdez i Badia. 2019. Learning to assess the quality of stroke rehabilitation exercises. In Proceedings of the 24th International Conference on Intelligent User Interfaces (IUI ’19). Association for Computing Machinery, New York, NY, USA, 218–228. DOI:https://doi.org/10.1145/3301275.3302273

## Coordinators

Sergi Bermúdez,
Mónica Cameirão

## Researchers

Diego Mora,

Carolina Jorge

## Partner

IST-ID

## Funded by

FCT

## Budget

144.371,30€

# PIE NEWS

**Poverty, Income, and Employment News**

PIE News / Commonfare is a socially and politically engaged project that recognizes the precarization of lives and social relations due to the crisis of traditional welfare systems and growing social inequalities. The project aims to contribute to face such societal challenges by making visible and supporting practices of collective and individual empowerment, autonomous life, and collaboration (e.g. ethical purchasing, free software, co-housing, fab labs, coworking, time banking, social cooperatives, ethical finance, community-gyms).

PIE News / Commonfare is building a digital platform –commonfare.net– by working in close cooperation with participants –including unemployed youth, precarious workers, non-European migrants and freelancers– in three pilot countries (Croatia, Italy, The Netherlands). The overall aim is to connect people and initiatives across Europe to confront together societal issues such as low income, precariousness and unemployment. The ultimate project goal, is the promotion of the Commonfare, that is a new socio-economic model based on the valorization of social cooperation and the central stage accorded to people's everyday life conditions.

http://pieproject.eu/

Start: 2016 Finish: 2019

## Coordinator

Maurizio Teli

## Researchers

Mariacristina Sciannamblo,
Mela Bettega,
Peter Lyle

## Partners

University of Trento,

Basic Income Network Italia,

Udruge Centar Za Mirovne Studije,

Museu da Crise,

Dyne.org,

Fondazione Bruno Kessler,

Abertay University

## Funded by

European Commission H2020, topic ICT- 10-2015 - Collective Awareness Platforms for Sustainability and Social Innovation

## Budget

143.750,00€

# REDEMA

Start: 2018 Finish: 2021

**Redesigning Madeira: Using Speculative Design to re-think energy policy and consumer behaviour**

Energy, in all its forms, is essential to modern and future living. Electricity, as a form of energy, powers our lives. It magically appears in sockets on the wall that deliver a seemingly endless supply. Behind the wall, however, energy resides in massive, alien infrastructures; it is transformed, transmitted radially across huge distances, and is commonly derived from the environmentally destructive burning of fossil fuels. Our interactions with energy should not be limited to inserting plugs, attached to domestic products, into sockets in the wall, but also to include a tangible connection to the background infrastructures of generation, transmission, and storage. Our contemporary lives are energy rich, but our relationship with energy is threadbare; electricity is ethereal and distant, a number on a meter.

Taking advantage of the unique context provided by the island of Madeira this research project will use a speculative design approach to explore new energy infrastructure and interaction scenarios with the aim of moving beyond the known limitations of smart grid initiatives. Speculative design can facilitate a re-scripting of the rules and constraints that determine energy policy and behaviour at this time. For example, the radial grid system, that is largely dominant across Europe, dictates or influences almost everything related to energy in highly complex ways: from the development of renewable energy generation methods (and figuring out how to feed that energy into the grid) to the design and function of any electrical product. Engineers, designers and consumers alike act within this paradigm, limiting new technological developments, such as 'smart metering', to simply being additions to the existing system. By thinking beyond the constraints of established and pervasive infrastructure this project will transform Madeira Island into a living laboratory for multi-scale energy experiments, exploiting its unique landscapes and natural conditions. These landscapes and the diverse energy resources available afford many opportunities for the creation of bespoke energy generation and storage schemes and new product interactions with the aim of facilitating a more holistic, sustainable and engaged relationship with energy.

## Coordinators

James Auger,
Julian Hanna

## Researcher

Victor Azevedo

## Partner

IST-ID

## Funded by

FCT

## Budget

233.639,71€

# SMILE

**SMart IsLand Energy Systems**

SMILE is a Horizon 2020 funded project with the goal of testing and demonstrating smart grid technologies, as well as business models, within large scale projects. SMILE involves three large scale pilot projects in three Island locations in Europe (Madeira in PT, Samsø in DK and Orkneys in the UK). The objective is to test solutions while establishing mutual learning processes and providing best practice guidance for replication in other regions of Europe.

The three pilots will test different combinations of technological solutions according to local specificities and conditions and the existing infrastructure and will involve all value chain actors needed to efficiently implement projects system-wide. Moreover, cross-cutting activities among the pilots will be devoted to solve common technical, organizational, legal, regulatory and market-related issues as well as to evaluate the solutions from the economic and business points of view.

## Selected Publications & Exhibitions

Houben, S., Bengler, B., Gavrilov, D., Gallacher, S., Nisi, V., Nunes, N., Capra, L., and Rogers, Y. (2019) Roam-IO: Engaging with People Tracking Data through an Interactive Physical Data Installation. In Proceedings of the 2019 on Designing Interactive Systems Conference (DIS '19). Association for Computing Machinery, New York, NY, USA, 1157–1169. DOI:https://doi.org/10.1145/3322276.3322303.

Scuri S., Tasheva G., Barros L., Nunes N.J. (2019) An HCI Perspective on Distributed Ledger Technologies for Peer-to-Peer Energy Trading. In: Lamas D., Loizides F., Nacke L., Petrie H., Winckler M., Zaphiris P. (eds) Human-Computer Interaction – INTERACT 2019. INTERACT 2019. Lecture Notes in Computer Science, vol 11748. Springer, Cham

https://www.h2020smile.eu/

Start: 2017 Finish: 2021

### Coordinator

Nuno Nunes

### Researchers

Dino Vasconcelos,
Jonathan Cavaleiro,
Luísa Barros,
Gergana Tasheva,
Sabrina Scuri,
Daniel Pestana

### Partners

Rina Consulting S.p.A.,
Aalborg University,
ACIF,
PRSMA,
Community Energy Scotland Limited,
Network of Sustainable Greek Islands,
EEM,
Ethniko Kentro Erevnas Kai Technologikis Anaptyxis – Centre for Research and Technology Hellas,
Lithium Balance A/S,
University of Groningen,
Route Monkey LTD,
Samsø Elektro ApS,
Samsø Energiakademi,
Samsø Kommune,
Stichting Energy Valley,
Sunamp Ltd,
Danish Technological Institute,
VCharge UK Limited

### Funded by

Horizon 2020

### Budget

425.500,00€

# SUAVE

Start: 2018 Finish: 2019

In this project, we are focused on studying new approaches to persuasive computing, heavily based on subliminal persuasion techniques, which explore the power of the automatic mind for behavioral change. One of the applications of this approach is to improve physical well-being and health (although one more context and prototype test is envisaged within the scope of online sales in the tourism sector). For example, sedentary lifestyles are known to have a high impact on public health and well-being and have been increasing worldwide. Portugal is, in fact, the European country with the highest sedentary rate. Interactive technologies can make use of discoveries in behavioral psychology and create new forms of persuasion, motivating users to adopt healthier behaviors.
The main challenge, therefore, is twofold: (i) designing and evaluating technologies that promote active aging, and (ii) promoting a more inclusive society for the aging of the population, which are mostly averse to technology and have different needs from others segments of the population.
In light of these challenges, researchers need more knowledge about how to design for the "automatic mind", or what Richard Thaler and Cass Sustein call "nudging". Adequate methods are currently lacking to develop a substantial body of knowledge about nudge-mediated technology. Thus, the main objective of this project is to develop a set of software tools and a methodological framework for delivering behavioral change interventions using "nudging". The toolkit will be developed for the Web, Android and iOS and will be built as an extensible structure that supports the design, administration and study of interventions by non-technical specialists, such as behavioral psychology scientists. The toolkit and corresponding API will also apply to the hotel and retail sectors, in order to explore the commercial side of the approach in an online sales context. Our approach will allow long-term exposure to behavioral concepts subliminally, thus creating an opportunity for continuous support for behavior change that minimizes the risk of relapse (in the case of the health sector) and increases conversion rates (case of the retail sector) and hospitality online).

**Coordinator**

Pedro Campos

**Researcher**

Francisca Pimenta

**Partners**

WOWSystems Lda.,
Psiprof Unipessoal Lda.

**Funded by**

PROCiência - IDE

**Budget**

30.709,50€

http://project-suave.com/

# Ph.D. Students

ITI offers Doctoral Programs in collaboration with the University of Madeira, University of Lisbon, University of Porto, NOVA University of Lisbon, University of Texas in Austin and Carnegie Mellon University. Our current cohort of Ph.D. students follows.

## Afonso Gonçalves
Supervisor: Sergi Bermúdez i Badia

Full Body Interaction in Virtual Environments with Large Projection Displays - Uses for Fitness Assessment, Exergaming and in Immersive Systems

## Ana Lúcia Faria
Supervisors: Salomé Pinho and Sergi Bermúdez i Badia

Development and clinical validation of interactive technologies for cognitive rehabilitation of stroke patients

## Ana Caraban
Supervisors: Pedro Campos, Evangelos Karapanos, Daniel Gonçalves

Exploring Heuristic and Cognitive Biases for the Design of Behavior Change Technologies

## Dinarte Vasconcelos
Supervisor: Nuno Nunes and João Pedro Gomes (IST)

A low-cost multi-purpose IoT sensor for Biologging and Ocean Monitoring.

## Duarte Gouveia
Supervisor: David Aveiro

Executable Model Ontology for Temporal Intelligent Organizations in Network Systems

## Fábio Darío Baptista
Supervisors: Morgado Dias and João Costeira

Rapid Hardware Implementation of New Paradigms of Artificial Neural Network (RHINPANN) for Renewable Energy Applications

## Fábio Mendonça
Supervisors: Morgado Dias, João Costeira and António García

Signal Processing Approaches for Sleep Quality Analysis in Suspected Sleep Disorder Patients

## Fábio Pereira
Supervisor: Mónica Cameirão

Multi-user touch surfaces for promoting social participation and self-efficacy in upper-limb stroke rehabilitation

## Greicy Silva
Supervisor: Peter Lyle, Cláudia Silva, and Fernanda Lussá

Understanding User Participation in the Local Sharing Economy

## José Corujeira
Supervisor: José Luís Silva and Rodrigo Ventura (IST)

Augmentation of Situation Awareness Through Multimodal Interfaces in Teleoperation

## Jude Mukundane
Supervisor: Chris Csíkszentmihályi

Creation of adaptive videogames for sustain active aging: the role of biocybernetic loops in game experience

## Lígia Duro
Supervisor: Teresa Romão, Evangelos Karapanos and Pedro Campos

Visual Quotes: How Does Visual Aesthetics Instigate Physical Activity Motivation?

## Luís Ferreira
Supervisors: Nuno Nunes and Mario Bergés (CMU)

Development of a Hypothesis Driven Serious Game for Dementia Relying on Music and Reminiscence

## Luísa Barros
Supervisors: João Dionísio Barros (UMa) and Lucas Pereira

Automation-tool for smart charging electric vehicles at households in isolated electrical grids. A case study in Madeira island

## Mara Dionísio

Supervisors: Valentina Nisi and Nuno Correia (FCT/NOVA)

Leveraging on Transmedia Entertainment-Education to Augment Tourists' Awareness of Local Values

## Maria José Ferreira

Supervisor: Evangelos Karapanos

Storytelling with Social Robots

## Michelle Kasprzak

Supervisor: Sandra da Silva and Chris Csíkszentmihályi

Social Curating: Artistic Methodologies for Socially-engaged Acts of Care, Repair, and Maintenance

## Miguel Ribeiro

Supervisor: Nuno Nunes, Johannes Schoening

Sensing and Community Open Data for Understanding the impact of Tourism

## Paulo Bala

Supervisors: Valentina Nisi, Nuno Correia (FCT/NOVA) and Nuno Nunes

Immersive Virtual Reality User Experience (IVRUX): Analysing Data to Understand Content, Interactions and Users

## Raul Masu

Supervisor: Nuno Correia (M-ITI) and Teresa Romão (FCT/NOVA)

Digital Musical Instrument Design: Fostering Authorship of Composers and Creativity of Performers

## Ricardo Sol de Jesus

Supervisor: Karolina Baras

A Predictive Model for the Acceptance of Wearable Ubiquitous Activity Monitoring Devices

## Roham Torabikalaki

Supervisors: Morgado Dias and Álvaro Gomes (UC)

Modelling demand flexibility and energy storage to support increased penetration of renewable energy resources on Porto Santo

## Sandy Rodrigues

Supervisor: Morgado Dias and Helena Ramos

Improving Machine Learning Prediction and Forecasting Models Used in Photovoltaic Monitoring Systems

## Sandra Olim

Supervisor: Valentina Nisi and Teresa Romão (FCT)

Augmented Reality Towards Facilitating Abstract Concept Learning

## Sara Tranquada

Supervisors: Nuno Correia (FCT/NOVA), Karolina Baras

Confronting the Numbers of Women in Computing Making the Gender Gap in Computing Visible and Debatable

## Sheikh Mostafa

Supervisor: Morgado Dias, João Costeira, and António Garcia

Obstructive Sleep Apnea Detection Using Fourth Level Device

## Teresa Paulino

Supervisor: Mónica Cameirão

BRaNTegrate: Promoting integrated person-centered care in cognitive rehabilitation using a serious gaming system

## Vanessa Cesário

Supervisor: Valentina Nisi and António Coelho (FEUP/INESC TEC)

Enhancing Museum Experiences for Teenagers through Gamification and Sorytelling Frameworks

# Ph.D. Graduation

Congratulations the Ph.D. student on his academic achievement.

**Rúben Gouveia**

Supervisor: Evangelos Karapanos; co-supervisor: Pedro Campos

**Tracking in the wild: Understanding User Engagement with Physical Activity Trackers**

Abstract

As the rates of chronical diseases, such as obesity, cardiovascular disease and diabetes continue to increase, the development of tools that support people in achieving healthier habits is becoming ever more important. Personal tracking systems, such as activity trackers, have emerged as a promising class of tools to support people in managing their everyday health. However, for this promise to be fulfilled, these systems need to be well designed, not only in terms of how they implement specific behavior change techniques, but also in how they integrate into people's daily lives and address their daily needs. My dissertations provides evidence that accounting for people's daily practices and needs can help to design activity tracking systems that help people get more value from their tracking practices.

To understand how people derive value from their activity tracking practices, I have conducted two inquiries into people's daily uses of activity tracking systems. In a fist attempt, I led a 10-month study of the adoption of Habito, our own activity tracking mobile app. Habito logged not only users' physical activity, but also their interactions with the app. This data was used to acquire an estimate of the adoption rate of Habito, and understanding of how adoption is affected by users' 'readiness', i.e., their attitude towards behavior change. In a follow-up study, I turned to the use of video methods and direct, in-situ observations of users' interactions to understand what motivates people to engage with these tools in their everyday life, and how the surrounding environment shapes their use. These studies revealed some of the complexities of tracking, while extending some of the underlying ideas of behavior change. Among key results: (1) people's use of activity trackers was found to be predominantly impulsive, where they simultaneously reflect, learn and change their behaviors as they collect data; (2) people's use of trackers is deeply entangled with their daily routines and practices, and; (3) people use of trackers often is not in line with the traditional vision of these tools as mediators of change – trackers are also commonly used to simply learn about behaviors and engage in moments of self-discovery.

Examining how to design activity tracking interfaces that best support people's different needs, my dissertation further describes an inquiry into the design space of behavioral feedback interfaces. Through a iterative process of synthesis and analysis of research on activity tracking, I devise six design qualities for creating feedback that supports people in their interactions with physical activity data. Through the development and field deployment of four concepts in a field study, I show the potential of these displays for highlighting opportunities for action and learning.

# Selected Publications


Nisi, V., Prandi, C., Nunes, N. (2020) Towards Eco-Centric Interaction: Urban Playful Interventions in the Anthropocene. In: Nijholt A. (eds) Making Smart Cities More Playable. Gaming Media and Social Effects. Springer, Singapore.

Cardoso, B., Ribeiro, M., Prandi, C., and Nunes, N. (2019) When Gamification Meets Sustainability: A Pervasive Approach to Foster Sustainable Mobility in Madeira. In Proceedings of the 1st ACM Workshop on Emerging Smart Technologies and Infrastructures for Smart Mobility and Sustainability (SMAS '19). Association for Computing Machinery, New York, NY, USA, 3–8. DOI:https://doi.org/10.1145/3349622.3355449.

Loureiro, P., Prandi, C., Nunes, N., Nisi, V. (2019) Citizen Science and Game with a Purpose to Foster Biodiversity Awareness and Bioacoustic Data Validation. In: Brooks A., Brooks E., Sylla C. (eds) Interactivity, Game Creation, Design, Learning, and Innovation. ArtsIT 2018, DLI 2018. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 265. Springer, Cham.

Silva, C., Prandi, C., Ferreira, M., Nisi, V., and Nunes, N. (2019) Towards Locative Systems for, and by, Children: A Cognitive Map Study of Children's Perceptions and Design Suggestions. In Proceedings of the 2019 on Creativity and Cognition (C&C '19). Association for Computing Machinery, New York, NY, USA, 382–395. DOI:https://doi.org/10.1145/3325480.3326568.

Silva, C., Prandi, C., Ferreira, M., Nisi, V., and Nunes, N. (2019) See the World Through the Eyes of a Child: Learning from children's cognitive maps for the design of child-targeted locative systems. In Proceedings of the 2019 on Designing Interactive Systems Conference (DIS '19). Association for Computing Machinery, New York, NY, USA, 763–776. DOI:https://doi.org/10.1145/3322276.3323700.

Loureiro, P., Prandi, C., Nisi, V., and Nunes, N. (2019) On exploiting acoustic sensing and citizen science in a game for biodiversity monitoring and awareness. IEEE INFOCOM 2019 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS), Paris, France. P. 572-577. DOI: 10.1109/INFCOMW.2019.8845197.

Vasconcelos, D., Nunes, N., Ribeiro, M., Prandi, P., and Rogers, A. (2019) LOCOMOBIS: a low-cost acoustic-based sensing system to monitor and classify mosquitoes. 16th IEEE Annual Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA. P. 1-6.

Nisi, V., Dionísio, M., Silva, C., and Nunes. N. (2019) A participatory platform supporting awareness and empathy building between tourists and locals: the Há-Vita case study. In Proceedings of the 13th Biannual Conference of the Italian SIGCHI Chapter: Designing the next interaction (CHItaly '19). Association for Computing Machinery. New York, NY, USA. Article 16, 1–10. DOI:https://doi.org/10.1145/3351995.3352049.

Dionísio M., Silva C., Nisi V. (2019) Fostering Interaction Between Locals and Visitors by Designing a Community-Based Tourism Platform on a Touristic Island. In: Lamas D., Loizides F., Nacke L., Petrie H., Winckler M., Zaphiris P. (eds) Human-Computer Interaction – INTERACT 2019. INTERACT 2019. Lecture Notes in Computer Science, vol 11747. Springer, Cham.

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# Talks

Which Corporeal Dimensions can be Computed in Contemporanean Dance? Novel Strategies for the visualisation of Choreographic Thinking in the Past Decade
Stephan Jurgens, May 8

Motion Capturing Creative Area (MOCCA-Project)
Jochen Feitsch, May 8

Coupling Biomedical Sensors with Choreographic Language
William Primett, May 8

Artificial Social Agents Beyond Symbol-based Interaction
Ulysses Bernardet, June 17

How far are we from communities?
Arminda Lopes, June 11

Realidade Virtual para neuroreabilitação
Mónica Cameirão, June 11

Feedbot - um braço robótico para ajuda autónoma a pessoas com deficiências motoras
Nuno Nunes, June 11

BreastScreening - integração de inteligência artificial no diagnóstico multimodal de cancro da mama
Nuno Nunes, June 11

LARSyS: a powerhouse for innovative research
José Alberto Santos Victor, June 11

LIFE: Engineering for and from the Life Sciences
João Sanches, June 11

INTERACTION: Cognitive Robots for Human Assistance
Alexandre Bernardino, June 11

Human robot interaction: the acting brain
José Alberto Santos Victor, June 11

Nudging users towards better lifestyles: a behavioral economics approach
Pedro Campos, June 11

Sense and Tell 2019
Valentina Nisi, June 11

Optimization and Control of Storage in Smart Grids
Umar Hashmi, October 9

Automation, User Experience and Ethics
José Abdelnour-Nocera, November 26

# EVENTS

Entrepreneurs' City 2019
October 24-27

Science in the Market 2019
November 22

European Researchers' Night
September 27

# Workshop

"LIFE" & "INTERACTION" - LARSyS
June 11

Progressive Products for Social Europe (MAST)
November 19-23

# Seminars & Symposia

SIIDS - Sound, Image, and Interaction Doctoral Symposium (MODI)
ITI, Funchal, October 4

ITI Doctoral Symposium
Casa de Saúde Câmara Pestana, Funchal, October 20

# Investing in the Future

ITI's primary goal is to develop interdisciplinary research in HCI in a welcoming environment for top researchers in engineering, social and behavioral sciences, design and the frontiers with arts and humanities. We want to keep investing in a professional infrastructure that promotes innovation, warranting that the results of our interdisciplinary research become relevant to companies and impact the economy.

Attract and retain experienced researchers from other parts of the world that will develop their scientific careers in ITI and therefore contribute to building critical mass and the internationalization and development of the affiliated academic institutions. International partnerships are the pillar of ITI's medium and long term future, and we shall work on deepening intuitional links with Carnegie Melon University but also with our partners in Europe.

ITI is seeking funds to allocate research space in all the academic institutions to which it is primarily affiliated. Apart from the 700m2 in Madeira proper space needs to be allocated in Lisbon at IST and FBAUL for ITI to expand its presence and welcome a larger cohort of PhD students and post-docs. This is not an easy challenge, not only because space is expensive and scarce but more importantly because the scientific training of ITI requires that students and researchers from all disciplines share the same space to learn from each other.

The recent evolution of ITI as a multi-institutional research unit will also open new opportunities for collaboration and advanced training with design, social sciences and the frontiers with the arts and humanities. This new millennium is characterized by challenges that require bringing together disciplines to tackle complex real world problems that rely on technology as much as they depend on a deep understanding of human needs, desires and expectations while guaranteeing that we don't compromise the future of our planet and the next generations.

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