m·iti
Madeira Interactive
Technologies Institute

ANNUAL REPORT 2018


MADEIRATECNOPOLO
pólo científico e tecnológico da madeira
m·iti

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A CENTRE OF DESIGN FOR GLOBAL CHANGE, CREATING SOCIOTECHNICAL SYSTEMS SUITED TO HOLISTIC CHALLENGES

ABOUT THE INSTITUTE

"M-ITI's location gives the Institute a unique status in that can do its research locally either within Madeira or close by, while guaranteeing that the research will have regional and even global impact."

M-ITI Advisory Board, 2017

The Madeira Interactive Technologies Institute (M-ITI) is a not for profit innovation institute of the University of Madeira, the youngest and smallest public university in Portugal. It is located in the Autonomous Region of Madeira, an outermost region of Europe.

M-ITI was conceived in 2000, formally integrated as a research group in 2007, and established as an Innovation Institute in 2010. M-ITI has also been a member of the National Associated Laboratory for Robotics and Systems in Engineering (LARSyS) since 2011.
In 2015, M-ITI was considered a Public Utility Institute (as published in the Jornal Oficial of 19 February 2015, series number 30).

M-ITI operates in the interdisciplinary domain of Human-Computer Interaction (HCI), encapsulating contributions from the disciplines of computer science, psychology, social sciences and design, with the goal of engaging in important scientific and technological challenges.

The location of M-ITI provides a unique setting to deploy a Living Lab for Interactive Technologies, where systems and services can be tested using open-innovation frameworks.

VISION

A centre of design for global change, creating socio-technical systems suited to holistic challenges.

Global changes - in climate or demographics; labour 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, organising, 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.

M-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 the economic and financial crisis, 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 M-ITI is an excellence centre of design for global change, aimed at identifying fresh approaches to the design of new technologies, new means of production, and new political configurations 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 M-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. M-ITI is strategically placed at the intersection of the American, European and African. As a multi-disciplinary Centre combining natural and social scientists, engineers, humanists, designers, and artists, its output will be focused on the area of applied science and human-centred technology. We will develop and share methods, working proofs, and "spin-off enterprises" focused on rebalancing the relationship of people and environment, production and consumption, the local and the global.

STRATEGY AND RESEARCH INFRASTRUCTURE

M-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.

M-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.

M-ITI will develop a unique research infrastructure that leverages the identification of demonstration of breakthrough research and design situated outside of global urban capitals, including active research in, and with, the global south for which Madeira is one of the outposts for transnational EU cooperation. 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.

MESSAGE FROM NUNO NUNES

President of the Board

Madeira Interactive Technologies Institute (M-ITI) is one of the leading research centers in Portugal focusing on human-computer interaction and design innovation. M-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. M-ITI was conceived in 2000, formally integrated as a research group in 2007, and established as an Innovation Institute in 2010. M-ITI has also been a member of the national Laboratory of Robotics and Engineering Systems (LARSyS) since 2011. M-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.

Our strategic priority was always to attract the best talent to Madeira, from students to junior and senior faculty that could help make M-ITI an excellence center in HCI research and design-driven innovation. In 2017, M-ITI is currently associated with 31 integrated members, around 114 researchers (including PhD students) and a cohort of more than 120 master and post-grad students, supported by a dedicated group of six staff members. This vibrant and enthusiastic community comes from 16 different nationalities from four continents. We welcome these people recognizing that excellence, in particular in one of the most remote regions of Europe, can only be achieved if you attract and retain the best.

We are pleased to highlight some of M-ITI's accomplishments in the last year. In 2017, we changed our statutes, clarifying the balance between the shareholders of M-ITI. The participation of the Regional Government is no longer through Madeira Tecnopolo but directly from the Region, which also takes a majority of voting rights. The University of Madeira remains the second founding member and M-ITI continues to have the role of Innovation Institute of the University. In July 2017 we held the external Advisory Board meeting, which was again a fruitful experience. The Advisory Board recommended that M-ITI continues the orientation towards becoming a center of design for global change with local relevance related to the unique geo-political positioning of Madeira. 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 M-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 M-ITI, which is again facing another FCT evaluation in 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 M-ITI to sustain and retain talented staff. Notwithstanding, 2017 was another record year 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.


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FOUNDING MEMBERS

M-ITI was founded in 2010 as an outgrowth of the Carnegie Mellon International partnership. Its founding members are the University of Madeira (UMa), Madeira Tecnopolo S.A. (MT) and Carnegie Mellon University (CMU). M-ITI conducts research and provides graduate training in the domain of human-computer interaction, contributing to the development of the field and addressing/engaging in important scientific and technological challenges that are both relevant to society and have significant economic impact.

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UNIVERSIDADE da MADEIRA

Carnegie Mellon University

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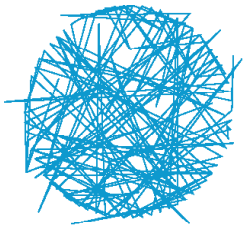
International Partnerships

Information and Communication Technologies Institute
Carnegie Mellon | PORTUGAL
AN INTERNATIONAL PARTNERSHIP

REPÚBLICA PORTUGUESA
XXI GOVERNO CONSTITUCIONAL

UT Austin | Portugal
International Collaboratory for Emerging Technologies, CoLab



LARSyS - Associate Laboratory of Robotics and Engineering Systems

LARSyS' ultimate goal is to be actively involved in a new generation of research 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@IST, IN+@IST, MARETEC@IST, and M-ITI@UMadeira). 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/IST), MARETEC, LTPM (IN+/IST) and M-ITI.

• URBAN SYSTEMS, relying on competences and human resources of SIPg (ISR/IST), MARETEC, LIES (IN+/IST) and M-ITI.

• AERONAUTIC and SPACE SYSTEMS, relying on competences and human resources of IRSg and DSORg (ISR/IST), MARETEC, LTCES and LTPM (IN+/IST) and M-ITI.

• ENGINEERING FOR AND FROM THE LIFE SCIENCES, relying on competences and human resources of SIPg, IRSg, LASEEBg and VISLAB (ISR/IST), LTCES and LTPM (IN+/IST) and M-ITI.

• COGNITIVE ROBOTS AND SYSTEMS FOR ASSISTED LIVING AND WORKING, relying on competences and human resources of VISLAB and IRSg (ISR/IST), LTPM (IN+/IST) and M-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/IST), DSORg, IRSg (ISR/IST), MA-

RETEC, LTPM (IN+/IST) and M-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. Special 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.

RESEARCHERS

The researchers of M-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 M-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.

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 M-ITI, and as post-doc researcher at ARDITI in the H2020 CiViTAS Destinations project.

Chris Csíkszentmihályi

ERA Chair & CTP Lab Director

Ph.D. (hc) from Cornish College of the Arts, has been a professor at colleges, universities, and institutes, including Distinguished Visiting Professor of Art and Design Research at Parsons the New School for Design. He cofounded and directed the MIT Center for Future Civic Media.

Cláudia Silva

Postdoctoral Research Fellow

Ph.D.w 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.

David Aveiro

Assistant Professor

Ph.D. in Computer Science and Information Systems Engineering from Instituto Superior Técnico of the Technical University of Lisbon. His teaching interests include organizational engineering, database management systems and decision support systems.

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.

Dulce Pacheco

Postdoctoral Research Fellow

Ph.D. in Psychology from University of Madeira. Main research interests are cooperative work, collaborative learning, multidisciplinary studies, creativity, and leadership.

Eduardo Fermé

Associate Professor

Fermé is an Associate Professor with aggregation at UMa in the area of Artificial Intelligence at the University of Madeira. Head of the Department of Informatics Engineering and Interactive Digital Media at the University of Madeira. His main topic of research is knowledge representation and reasoning, in particular belief revision and nonmonotonic reasoning.

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.

Frederica Gonçalves

Assistant Professor

Ph.D. in Computer and Software Engineering, specialty in Human Computer Interaction. She is an Assistant Professor at UMa and Researcher at Madeira-ITI/LARSyS. 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).

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.

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.

José Luís Silva

Assistant Professor

Ph.D. in Computer Science from the Portuguese MAP-i Consortium (University of Minho, University of Aveiro and University of Porto) and postDoc at the University of Toulouse. His main research interests lies 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.

Lina Brito

Assistant Professor

Ph.D. in Telecommunication systems and eletrotecnical engineering from the University of Madeira. Focus are on Wireless Sensor Networks and IoT (Internet of Things) applied to smart cities and citizens' well-being.

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 M-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 and at LARSyS, M-ITI.

Mariacristina Sciannamblo

Postdoctoral Research Fellow

Ph.D. in Sociology and Applied Social Sciences from University of Rome Sapienza. With interests in Participatory design, computer supported cooperative work, science and technology studies, feminist technoscience studies.

Marko Radeta

Postdoctoral Research Fellow

Marko is the CEO of TIGERWHALE and is a Cross-Cultural Ambassador from UNESCO Club Sorbonne. He holds a Ph.D. in Interaction Design and BSc in Computer Engineering. His research area is Emotional-aware Interaction Design and Development.

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.

Maurizio Teli

Assistant Professor

Ph.D. in Sociology and Social Research. Has worked in or coordinated several EU funded projects. He is now focusing on the design of digital technologies nurturing of the common, in particular as Research and Innovation Coordinator of the PIE News H2020 project.

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

Research Fellow

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 PhD 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.

Parakram Pyakurel

Postdoctoral Research Fellow

Parakram is a postdoctoral research fellow at M-ITI. He holds a Ph.D. in engineering from Florida Atlantic University and master's degree in "Planning and Operation of Energy Systems". His academic and professional backgrounds are in renewable energy systems.

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 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.

Peter Lyle

Postdoctoral Research Fellow

Ph.D. in the School of Design at Queensland University of Technology. With interests in computer science, interaction design and urban informatics, with a focus on communities.

Roberto Cibin

Postdoctoral Research Fellow

Ph.D. in Social Sciences - Interaction, Communication, Cultural Construction from the University of Padova (Italy). Main research interests lie in Science and Technology Studies, Participatory Design and public engagement in decision-making.

Sabrina Scuri

Postdoctoral Research Fellow

Sabrina is a postdoctoral research fellow at M-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 M-ITI as well as a lecturer at the School of Design, University of Edinburgh. Her main research areas are Interface Design and User Experience.

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.

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).

Ângela Barbosa

Accounting and Administrative Manager

Ângela joined the Institute in 2014. She works in team with the Financial Director to provide internal and external accounting reports. Her role includes controlling all the procurement and public hiring processes, ensure periodical analytical and general accounting and financial output.

Carlos Gomes

Financial Director

Carlos joined the Institute in February 2011. After 1 year working as project manager, he was appointed Chief Financial Officer in 2012. As CFO his role includes, elaborating the yearly budget for the Institute and guaranteeing the best practices according with the fiscal rules.

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 M-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.

Duarte Pinto

Project Manager

Duarte joined the Institute in March 2017. After a previous 3 year experience at M-ITI in 2011, he returned to the Institute as a project manager. As PM his role includes guaranteeing that projects are carried out in line with the work plan and budget, according to funding rules and regulations; Preparation of financial and administrative reports.

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 M-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 M-ITI's network & system infrastructure.

Helena Barbosa

Design Assistant

After working as a research assistant since 2012, Helena joined M-ITI as a Design Assistant in December 2017. Her role includes giving support to the communication team and staff.

Nadine Pereira

Project Manager

Nadine joined the Institute in February 2017. Since then, she has been the PM of the INTERREG MAC1420 projects, which involve the control and organization of all the expenses made in the scope of the activities planned for each project and the global management of a variety of tasks that ensure its' sustainable development.

STRATEGIC AMBITIONS

Research Capacity

Establish M-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 M-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 M-ITI's existing human resources.

Intellectual Property

Substantially improve the RTD indicators of the Autonomous Region of Madeira and contribute to changing the economic and development paradigm, which is presently under enormous pressure due to 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 M-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 Technical Practice Lab

Improve the innovation performance by creating a unique research infrastructure based on an open innovation model that leverages Madeira as 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 M-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.

STRENGTHS

- High potential research faculty
- Institutional support and strategic alignment
- International connections and high-quality graduate education
- Attractiveness and high quality of life in Madeira
- Cooperation with industry
- Strong leadership
- Alignment with Madeira RIS3
- Completed the hiring of ERA Chair's R&D team

WEAKNESSES

- Limited participation in the ERA
- Lack of research management structure
- Low critical mass, visibility and reputation
- Lack of in-house and large scale deployment equipment
- Lack of innovation, entrepreneurship and intellectual property management
- Insufficient laboratory space

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

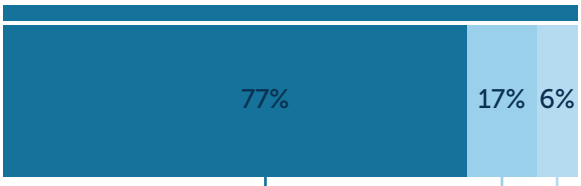
THREATS

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

FUNDING SOURCES

TOTAL EXPENDITURE

17.806.577,34€



Competitive External
13.668.249,75€

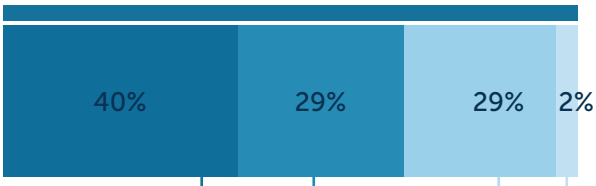
Core Funding
2.984.922,67€

Industry
1.153.404,92€

2010
2011
2012
2013
2014
2015
2016
2017
2018

COMPETITIVE EXTERNAL FUNDS

13.668.249,75€



Regional Funds
5.491.242,21€

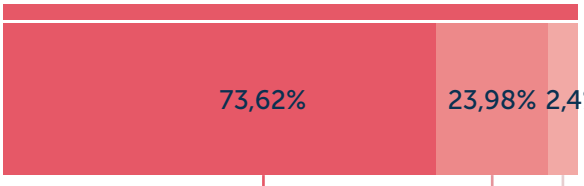
National Funds
3.956.022,11€

EC Funds
3.951.394,98€

Infrastructure
269.590,45€

TOTAL EXPENDITURE

1.464.232,27€



Competitive External
1.077.970,12€

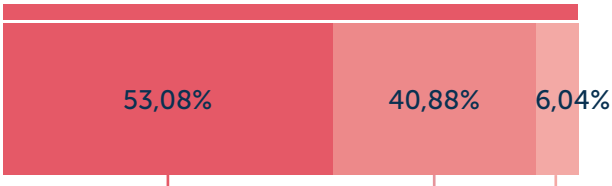
Core Funding
351.148,21€

Industry
35.113,94€

FOR 2018

COMPETITIVE EXTERNAL FUNDS

1.077.970,12€



EC Funds
572.163,46€

Regional Funds
440.667,09€

National Funds
65.139,57€

FOSTERING RESEARCH

Currently M-ITI is involved in 18 research projects involving a total funding of 1.077.970,12€. Our current project portfolio spans the areas of neuro-rehabilitation, energy, digital culture and human-robot interaction.

M-ITI IN NUMBERS 2014-2018

8244

Total number of citations

39

Research Projects where M-ITI has been involved

621

Research publications (Google Scholar)

235

Researchers in Projects

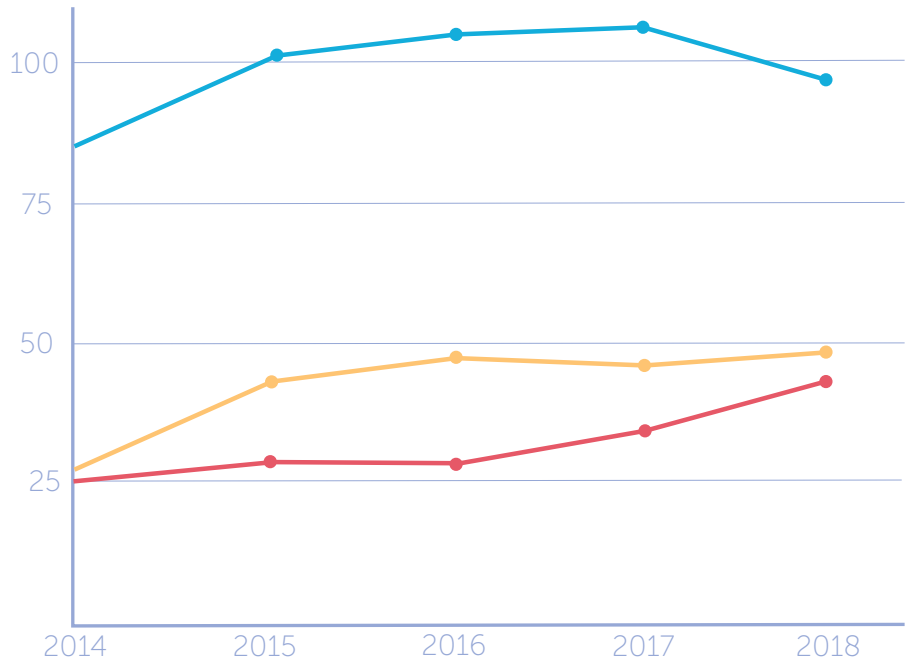
M-ITI NUMBERS EVOLUTION 2014-2018

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

M-ITI RESEARCHERS AND STUDENTS IN LARSYS

Researchers and Students	2014	2015	2016	2017	2018	Total
No. of Integrated Researchers	82	103	111	114	97	507
No. of Integrated Researchers with Ph.D.	25	27	27	31	40	150
No. of Ph.D. Students Advised by Integrated members of the R&D Unit	26	40	46	44	47	203
No. of Research contracts with national public or Private Entities	14	21	15	22	29	101
No. of Research Contracts with International Bodies	1	6	4	10	13	34
No. of Researchers (Post-Doc grants)	-	-	8	12	13	33
No. of Researchers with Ph.D. (contracts)	-	-	5	5	6	16

M-ITI HUMAN RESOURCES



No. of Ph.D. Students Advised by Integrated members of the R&D Unit

No. of Integrated Researchers with Ph.D.

No. of Integrated Researchers

M-ITI PUBLICATIONS AND PHD THESIS

Indicators	2014	2015	2016	2017	2018	Total
Journal Publications (international, peer reviewed and others)	31	25	26	22	65	169
Ph.D. Thesis Awarded (total)	2	3	3	2	2	12
Ph.D. Thesis Awarded in Partnerhips with International Institutions (CMU, MIT and others)	-	1	1	-	-	2
International Conferences	88	73	85	61	102	409

IMPACT CASES

M-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, M-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. M-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 M-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

AHA

Augmented Human Assistance

Start: 2014 **Finish:** 2018

The Augmented Human Assistant project is an ambitious scientific and technological endeavour that aims at providing solutions to alleviate the current and upcoming social, psychological and economical burden related to sedentarism and aging related morbidities. It brings together innovation and research in a cross-disciplinary consortium with expertise in such diverse areas such as Human Functioning and Performance, Augmented Reality (AR) technologies, serious games for health, physiological signal acquisition systems, computer vision systems, robot navigation and intelligent scene assessment.

The integrated AHA system will be composed by a mobile robotic platform with advances in perception, navigation and control skills; leveraged with an extended set of sensors for human sensing and emotional state estimation; serious gaming abilities through novel augmented reality methods yielding extended feedback modalities for physical exercising and motor rehabilitation; and a virtual coach system with technologies and techniques that assist and encourage users while they perform rehabilitation exercises, and instils better compliance with their prescribed exercise regimen. Such platform will define a new class of assistive devices for healthy, elderly and patient users, allowing new modalities of interaction and engagement not yet available in the state-of-the-art.

Selected Publications & Exhibitions

Muñoz, J., Gouveia, E. R., Cameirão, M. S., & Bermudez i Badia, S. (2018). Closing the Loop in Exergaming - Health Benefits of Biocybernetic Adaptation in Senior Adults. Presented at the CHI-PLAY, Melbourne, Australia.

Afonso Gonçalves, Sergi Bermúdez i Badia. (2018). KAVE: Building Kinect Based CAVE Automatic Virtual Environments, Methods for Surround- Screen Projection Management, Motion Parallax and Full-Body Interaction Support. In PACM on Human-Computer Interaction (Vol. 2, p. EICS). ACM. https://doi.org/10.1145/3229092

Muñoz, J., Gonçalves, A. R., Gouveia, E. R., Cameirao, M. S., & Bermúdez i Badia, S. (2018). Measured and Perceived Physical Responses in Multidimensional Fitness Training through Exergames in Older adults. Presented at the 10th International Conference on Virtual Worlds and Games for Serious Applications, Würzburg, Germany: ACM.

Paulino, T., Muñoz, J., Bermudez i Badia, S., & Cameirao, M. S. (2018). Design of an Integrative System for Configurable Exergames Targeting the Senior Population. In Human Systems Engineering and Design.

http://neurorehabilitation.m-iti.org/lab/aha-augmented-human-assistance/

Coordinators

Mónica Cameirão,
Sergi Bermúdez i Badia,
Élvio Rúbio

Researchers

Afonso Gonçalves,
Honorato Sousa,
John Muñoz,
Min Hun Lee,
Teresa Paulino

Partners

IST-ID,

CMU,

FMH,

YDreams,

PLUX

Funded by

FCT, CMUP-ERI/HCI/0046/2013

Budget

186.861,70€

ALERT4YOU

Building a new citizen and tourist information management system, through the latest ICT (web and smartphone)

Start: 2017 **Finish:** 2019

This project counts on the construction of a new citizen and tourist information management system, through the latest ICT (web and smartphone), human centered, that allows the dissemination of alert information according to individual circumstances with complementary useful information and can be an interactive system that improves efficiency and effectiveness not only upstream of extreme events but also downstream. It is also intended to take advantage of the universality of the system in order to improve the entire tourist safety system in the regions involved. Inspired by the European ALER4EUROPE system, this new platform aims to harmonize the regions and mobilize the population for greater citizenship and a sense of security, while giving it a pedagogical and security tool in their daily lives.

Coordinators

Chris Csíkzentmihályi,
Simone Ashby

Researchers

Jorge Ramos
Emily Boaventura
Petra Zist

Partners

Direção Regional das Obras Públicas e Comunicações dos Açores,

Associação de Municípios da Região Autónoma da Madeira,

Dirección General de Seguridad y Emergencias, Cabildo Insular de La Gomera,

Service Nacional de Protection Civil y Bomberos de Cabo Verde,

Serviço Regional de Proteção Civil e Bombeiros dos Açores,

Serviço Regional de Proteção Civil, Núcleo Operacional da Sociedade de Informação

Funded by

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

Budget

199.349,60€

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

Dionisio, M., Nisi, V., & Correia, N. (2018). Leveraging on Transmedia Entertainment-Education to Augment Tourists' Awareness Towards Social Issues. In International Conference on Interactive Digital Storytelling (pp. 646-651). Springer, Cham.

Bala, P., Masu, R., Nisi, V., & Nunes, N. (2018). Cue Control: Interactive Sound Spatialization for 360º Videos. In International Conference on Interactive Digital Storytelling (pp. 333-337). Springer, Cham.

Bala, P., Dionisio, D., Nisi, V., & Nunes, N. (2018). Visually induced motion sickness in 360 videos: comparing and combining visual optimization techniques. IEEE International Symposium for Mixed and Augmented Reality 2018.

Nisi, V., Dionísio, M., Silva, C., Nunes, N. (2018). Leveraging Transmedia Storytelling to support awareness about natural and cultural heritage of a peripherical tourist destination island. Workshop at Narrative and Hypertext 2018.

Prandi, C., Nisi, V., Villaflor, R. J., Liao, S., Best, B., Gavina, V., & Nunes, N. (2018, September). On designing a way-finding system to assist users with respiratory ailments and track symptoms. In Proceedings of the 20th International Conference on Human-Computer Interaction with Mobile Devices and Services Adjunct (pp. 47-54). ACM.

Prandi, C., Nisi, V., & Nunes, N. (2018, July). On exploring a pervasive infrastructure to foster citizens participation and sustainable development. In Proceedings of the 32nd International BCS Human Computer Interaction Conference (p. 223). BCS Learning & Development Ltd.

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

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€

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.

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

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

Start: 2017 **Finish:** 2019

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.

Selected Publications & Exhibitions

Auger, J., and Hanna, J., eds. (2019). Reconstrained Design. Madeira: Reconstrained Design Group.

Auger, J., Hanna, J., Sonia, M., and Ashby, S. (2019). Common World. Designing in Dark Times: An Arendtian Lexicon. Eds. V. Tassinari and C. Dilnot. London: Bloomsbury.

Auger, J., and Hanna, J. (2019). How the Future Happens. Journal of Futures Studies 23.3. Special Issue on Design and Futures. Eds. S. Candy and C. Potter. pp. 93-98. DOI:10.6531/JFS.201903_23(3).0001

Watts, L., Auger, J., and Hanna, J. (2018). The Newton Machine: Reconstrained Design for Energy Infrastructure. SHAPE ENERGY Research Design Challenge: Control, Change and Capacity-Building in Energy Systems. Eds. P. Sumpf and C. Büscher. Cambridge: SHAPE ENERGY.

Hanna, J., Auger, J., and Encinas, E. (2017). Reconstrained Design: A Manifesto. In Proceedings of the 2017 ACM Conference Companion Publication on Designing Interactive Systems. ACM, New York, NY, USA, 177-181. DOI: 10.1145/3064857.3079141

Auger, J., Hanna, J., and Encinas, E. (2017). Reconstrained Design: Confronting Oblique Design Constraints. NORDES, Oslo, Norway, June 2017.

Hanna, J., and Auger, J. (2017). Promise in the Periphery: Designing Bespoke Energy for Madeira. REMOTE: Rethinking Remoteness and Peripherality, Longyearbyen, Svalbard, Norway, January 2017.

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

Start: 2018 **Finish:** 2020

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.

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

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.

Start: 2018 **Finish:** 2021

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€

FI-MAC

Future Internet Macaronesian Plaftform for Business Acceleration

Start: 2016 **Finish:** 2019

The FI-MAC project has as main goal the Technological Acceleration and Internationalization of Small and Medium Enterprises (SMEs) based in Madeira, the Azores or the Canaries. FI-MAC is a project funded by the Mac-2014-2020 program of the European Regional Development Fund (Interreg).

The FI-MAC project aims to support SMEs in the Macaronesia region in increasing their competitiveness, modernizing themselves, and "taking the leap" for internationalization using Future Internet Technologies made available by the European Commission through the FIWARE platform.

Under the Open Call of the FI-MAC project, 16 SMEs were selected to benefit from 60 hours of personalized strategic and technological consulting. These companies will have to develop a project during the year of 2018, with the support of FIWARE tools and specialists from the FI-MAC consortium to create new business opportunities at an international level. The projects of these 16 companies will be evaluated in the first quarter of 2019 by an international jury and 4 will be selected which will receive, until the end of 2019, additional specialized training in internationalization, having in mind further expansion outside the islands, improvement of their commercial strategy, participation in R&D projects and international trade agreements.

In order to inform Macaronesia SMEs about potential technological and business opportunities, the FI-MAC team at
M-ITI provides an information repository regarding the architecture and enablers made available for free by the FIWARE platform: https://fimac.m-iti.org/

http://www.fiwaremac.org/

Coordinator

David Aveiro

Researchers

Duarte Pinto

Partners

Cabildo Insular de La Palma,

Asociación de Empresas Tecnológicas Innovalia,

FGULL. Fundación General Universidad de La Laguna,

FRCT - Fundo Regional para a Ciência e Tecnologia,

Câmara do Comércio e Indústria de Ponta Delgada

Funded by

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

Budget

92.700,04€

FUTURE INDUSTRIAL KITCHEN

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

Start: 2018 **Finish:** 2019

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.

Coordinator

Shujoy Chakrarborty

Researchers

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

Partners

FN Hotelaria,

IST

Funded by

Pro-ciência - IDE

Budget

200.025,36€

www.futurekitchen.m-iti.org/

GRASSROOT WAVELENGTHS

Highly Networked Grassroots Community Radio through a Scalable Digital Platform

Start: 2018 **Finish:** 2020

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.

Coordinator

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€

https://grassrootsradio.eu/

LARGESCALE

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

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.

Start: 2018 **Finish:** 2021

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 M-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€

Selected Publications & Exhibitions

Csíkszentmihályi, C., Mukundane, J., Rodrigues, G. , Mwesigwa, D., Kasprzak, M. The Space of Possibilities: Political Economies of Technology Innovation in Sub-Saharan Africa, Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, Paper No. 306, Montreal, Canada, April 2018.

Lyle, P., Sciannamblo, M., Silva, C., and Teli, M. (2018). Communication in infrastructuring, or tales from a collaborative project. In Proceedings of the 30th Australian Conference on Computer-Human Interaction (OzCHI '18). ACM, New York, NY, USA, 156-161. DOI: https://doi.org/10.1145/3292147.3292179

http://erachair.m-iti.org

MACBIOIDI

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.

Selected Publications & Exhibitions

Pereira, F., Ornelas, R., Bermúdez i Badia, S., & Cameirão, M. S. (2018). Exploring Materials and Object Properties in an Interactive Tangible System for Upper Limb Rehabilitation. Presented at the 12th International Conference on Disability Virtual Reality and Associated Technologies, Nottingham.

Modroño, C., Bermúdez I Badia, S., Cameirão, M. S., Pereira, F., Paulino, T., Marcano-Serrano, F., ... González-Mora, J. L. (2018). Is it necessary to show virtual limbs in action observation neurorehabilitation systems? Presented at the 12th International Conference on Disability Virtual Reality and Associated Technologies, Nottingham.

Badia, S. B. i, Quintero, L. V., Cameirao, M. S., Chirico, A., Triberti, S., Cipresso, P., & Gaggioli, A. (2018). Towards Emotionally-Adaptive Virtual Reality for Mental Health Applications. IEEE Journal of Biomedical and Health Informatics, 1–1. https://doi.org/10.1109/JBHI.2018.2878846

Faria, A. L., Cameirão, M. S., Couras, J. F., Aguiar, J. R. O., Costa, D., Martins, G., & Bermúdez i Badia, S. (2018). Combined cognitive-motor rehabilitation in virtual reality improves motor outcomes in chronic stroke – a pilot study. Frontiers in Psychology, 9. https://doi.org/10.3389/fpsyg.2018.00854

https://goo.gl/y7XpHT

Start: 2017 **Finish:** 2019

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€

MAST

Master Module in Art, Science and Technology

Start: 2018 **Finish:** 2020

The MAST project is an academic project that aims to develop an applied study module at the intersections of Art, Science and Technology, combining methodologies and practices that intertwine the academic sphere closely with the Culture and Creative Sectors.

Nurturing a critical perspective on the historical, economical, social and above all cultural relevance of this interdisciplinary blend within the new digital shift, the MAST project develops innovative, ICT-enhanced teaching and learning methods. Students from different countries and disciplines will, under mentorship of engineers, scientists and artists, in partnership with relevant NGOs and industry partners, jointly tackle challenges emerging from the paradox between the obviously disparate agendas of Europe's ambition towards innovation on the one side, and the need for social equity on the other.

Coordinators

Sergi Bermúdez,
Chris Csíkszentmihályi

Partners

University of Nova Gorica, School of Arts,

Graz University of Technology, Institute of Spatial Design,

Kersnikova Institute,

Kitchen Budapest,

Culture Action Europe,

Croatian Cultural Alliance/Unicult programme

Funded by

Creative Europe

Budget

100.674,15€

www.mastmodule.eu

MITIEXCELL

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

Start: 2015 **Finish:** 2020

MITIExcell aims to improve M-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.

Selected Publications & Exhibitions

Pereira, L., & Nunes, N. (2018). Performance evaluation in non-intrusive load monitoring: Datasets, metrics, and tools—A review. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery, 8(6), e1265.

Radeta, M., Nunes, N. J., Vasconcelos, D., & Nisi, V. (2018, June). POSEIDON-Passive-acoustic Ocean Sensor for Entertainment and Interactive Data-gathering in Opportunistic Nautical-activities. In Proceedings of the 2018 on Designing Interactive Systems Conference 2018 (pp. 999-1011). ACM.

Ashby, S., Hanna, J., Matos, S., & Rodrigues, R. (2018, October). Collaborative Narrative Visions and the Manifesto Machine. In Companion of the 2018 ACM Conference on Computer Supported Cooperative Work and Social Computing (pp. 13-16). ACM.

Loureiro, P., Prandi, C., Nunes, N., & Nisi, V. (2018). Citizen Science and Game with a Purpose to Foster Biodiversity Awareness and Bioacoustic Data Validation. In Interactivity, Game Creation, Design, Learning, and Innovation (pp. 245-255). Springer, Cham.

Silva, G. K., & Silva, C. (2018, July). Motivations in the sharing economy: a study of profit and non-profit services in the tourism context. In Proceedings of the 32nd International BCS Human Computer Interaction Conference (p. 136). BCS Learning & Development Ltd.

Coordinators

Nuno Nunes,
Valentina Nisi

Researchers

Cláudia Silva,
Deborah Castro,
Dulce Pacheco,
Gemma Rodrigues,
Harry Vasanth,
Marko Radeta,
Sónia Matos

Partners

Carnegie Mellon University,

University of Texas at Austin,

University College London

Funded by

Madeira 1420 (IDR)

Budget

2.436.560,17€

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

MODI

Moving Digits: Augmented Dance for Engaged Audience

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€

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.

NEUROAUGVR

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

Start: 2018 **Finish:** 2021

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.

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

Start: 2016 Finish: 2019

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.

Selected Publications & Exhibitions

Lyle, Peter, Mariacristina Sciannamblo, and Maurizio Teli. (2018). Fostering Commonfare. Infrastructuring Autonomous Social Collaboration. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, 452:1–452:12. CHI '18. New York, NY, USA: ACM.

Sciannamblo, Mariacristina, Peter Lyle, and Maurizio Teli. 2018. Fostering Commonfare. Entanglements between Participatory Design and Feminism. In Proceedings of DRS 2018 International Conference: Catalyst, 2:458–71. DRS 2018. Limerick, Ireland.

Teli, Maurizio, Peter Lyle, and Mariacristina Sciannamblo. 2018. Institutioning the Common: The Case of Commonfare. In Proceedings of the 15th Participatory Design Conference: Full Papers - Volume 1, 6:1–6:11. PDC '18. New York, NY, USA: ACM.

http://pieproject.eu/

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

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

Start: 2018 **Finish:** 2021

Coordinators

James Auger,
Julian Hanna

Researcher

Victor Azevedo

Partner

IST-ID

Funded by

FCT

Budget

233.639,71€

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.

SENSE SEAT

Interactive tech furniture to increase productivity, creativity and well-being

Start: 2017 **Finish:** 2018

The goal of this project is to research, design and deploy interactive technological furniture for office spaces that can, in a subliminal way, influence the productivity, creativity and well-being of the users. This is achieved through sensors and actuators embedded in a form factor which allows the users to focus, relax, and work.
the workspace, its architecture and the stimuli that it provides directly affects the productivity and the physical and mental well-being of a worker.

A piece of furniture with unique design and incorporating a set of motion sensors, pressure, light, heart rate, breathing rhythm; and actuators: LEDs, 3D sound, position change engines; with the disruptive goal of increasing the levels of well-being, productivity and creativity of its users, by detecting patterns, modeling and predicting user behavior so that the system can perceive the best ambiences for personal work and detect peaks of productivity will be created. Sense-Seat will automatically identify the user and will apply the users preferences.

Selected Publications & Exhibitions

Pedro F. Campos, Diogo Cabral, and Frederica Gonçalves. 2018. Sense.Seat: Inducing Improved Mood and Cognition through Multisensorial Priming. In The 31st Annual ACM Symposium on User Interface Software and Technology Adjunct Proceedings (UIST '18 Adjunct). ACM, New York, NY, USA, 72-74.

Campos, P., Ehrenberg, N., Campos, M. (2018). Designing Interactions with Furniture: Towards multi-sensorial interaction design processes for interactive furniture. In Proceedings of ICEIS 2018 - International Conference on Enterprise Information Systems.

Ehrenberg, N., Silva, J. L. and Campos, P. (2018). Challenging Disruptions in Workspaces Through an Interactive Sensor-Based Seat. In Proceedings of ACM TEI'18 - Tangible and Embedded Interaction.

Coordinators

Pedro Campos

Researchers

Diogo Cabral,
Frederica Gonçalves,
José Luís Silva,
Nils Ehrenberg,
Pedro F. Campos

Partners

WowSystems,

Nuum Studio

Funded by

IDERAM

Budget*

51.166,71€

www.sense-seat.com

*correspondent to M-ITI's provision of services

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

Luísa Barros, Lucas Pereira, and Parakram Pyakurel. 2018. On the Challenges of Charging Electric Vehicles in Domestic Environments. In Proceedings of the Ninth International Conference on Future Energy Systems (e-Energy '18). ACM, New York, NY, USA, 420-422. DOI: https://doi.org/10.1145/3208903.3212045

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€

SOCIAL TECH ECOSYSTEMS IN SUB-SAHARAN AFRICA

Start: 2016 **Finish:** 2018

The 'Social Tech Ecosystems in sub-Saharan Africa' study is a research project commissioned by a partnership of three key foundations making grants in the fields of social tech and international development: Comic Relief, Indigo Trust and Nominet Trust. The study, which started in December 2016, is combining field work in sub-Saharan Africa, desk review, a peer nomination process and a number of interviews with relevant key players. The study will result in an opendatabase and a final open access report accessible to the public. Its site will document some of the research process throughout its progress, featuring interviews, videos and analyses, as well as a link to the database and the final report when made public.

Selected Publications & Exhibitions

Rodrigues, G., Csíkszentmihályi, C., Mwesigwa, D., Mukundane, J., Kasprzak, M. Social Tech Ecosystems in Sub-Saharan Africa, (M-ITI, 2018).

Coordinators

Chris Csíkszentmihályi,
Gemma Rodrigues

Researchers

Cristiano Gianolla,
Daniel Mwesigwa,
Elise Leclerc,
Jude Mukundane,
Kaiton Williams,
Michelle Kasprzak

Partners

Comic Relief

Indigo Trust

Nominet Trust

Funded by

Nominet Charitable Foundation

Budget

40.126,00€

http://ssasoctech.squarespace.com/

EDUCATIONAL PROGRAMS

M-ITI is active in research and education in the areas of Human-Computer Interaction, Informatics Engineering and Entertainment Technology. In all three domains M-ITI offers high-quality programs with our partners, University of Madeira, University of Lisbon, University of Porto, NOVA University of Lisbon, University of Texas in Austin and Carnegie Mellon University.

M-ITI IN NUMBERS 2013 - 2018

664

Enrollments in M-ITI's educational programs

7

Educational Programs

279

Graduated students

43

Different Nationalities among Students

EVOLUTION OF M-ITI STUDENTS 2010 - 2018

	2013/14	2014/15	2015/16	2016/17	2017/18
PAHT Briding-program Post-graduation on Human Aspects of Technology	-	7	14	-	-
MEI Master in Computer Science	172	89	108	-	-
MHCI Master in Human Computer Interaction	18	15	24	30	14
MET Master of Enternainment Technology	8	7	7	-	-
PDMD Ph.D. in Digital Media	-	-	7	10	9
NETSYS Ph.D. in Networked Interactive Cyber Physical Systems	-	-	8	9	8
DEI Ph.D. in Computer Engineering	25	26	18	18	10

DEI

Ph.D. in Computer Science

www.m-iti.org/node/2408

Director: Pedro Campos

This is a 2 year full-time Ph.D. in Computer Science Program directed by UMa (Universidade da Madeira) in partnership with M-ITI, with the primary goal of contributing to graduate highly qualified professionals and researchers in the area of computer science.

In this Ph.D. program, students have the chance to be co-supervised and oriented by our researchers and faculty members, also having the chance to work on their research subjects and also do several of the program courses at M-ITI's facilities - contributing for improving their skills in the areas of Human-Computer Interaction and Entertainment Technology.

The Program accepts students from the areas of computer science, software and informatics engineering, and will prepare them to conduct autonomous research projects both in the academic and economic sector. It will also give them high qualifications to think and organize complex systems as well as finding the best solutions to several and real context problems.

7 Number of students enrolled in 2018

PDMD

Ph.D. in Digital Media

www.m-iti.org/pdmd

Director: Valentina Nisi

This program was created through the partnership between the FCT/UNL (Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa), the FEUP (Faculdade de Engenharia da Universidade do Porto) and UT Austin (University of Texas in Austin, United States).

This is a 4-year Ph.D. program, that is aimed at students with a masters degree (2nd cycle Bologna or pre-Bologna) in the areas of information / communication sciences, multimedia, interactive design and all scientific and technological digital media areas. Digital media is an area that is rapidly growing and has gained increasing importance in our daily lives.

The Digital Media Ph.D. program aims to train researchers, academics and leaders in innovative processes. This training will enable the conceptualization and development of digital products and services, having taken into account target audiences, contexts, and goals relevant to several distribution channels.

11 Number of students enrolled in 2018

NETSYS

Ph.D. in Networked Interactive Cyber Physical Systems

www.m-iti.org/netsys

Director: Morgado Dias

A 4-year Ph.D. program, in which students have one year dedicated to curricular courses and three years dedicated to research.

This program is aimed at students with a masters degree (2nd cycle Bologna or pre-Bologna) in engineering (electronic, computers, mechanical, aerospace and IT), computer science and applied mathematics and it offers a high level of expertise and skills in cyber-physical interactive systems. This Ph.D. will provide students with the conceptual, scientific and technological tools to deal with the most challenging problems that happen in some of the most relevant real-life situations in the world.

This Ph.D. in networked interactive cyber-physical systems aims to train researchers, professors and professionals to deal with innovative processes and situations. It also aims to enable them to analyse complex situations and to propose new solutions, as well as giving them the ability to manage multidisciplinary teams.

11 Number of students enrolled in 2018

PH.D. STUDENTS

M-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

Design and Assessment of Virtual Reality Methods for the Cognitive Rehabilitation of Stroke

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 Paulo 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

Supervisors: Mónica Cameirão

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

Greicy Silva

Supervisor: Nuno Nunes

The Sharing Economy Phenomenon

José Corujeira

Supervisor: José Luís Silva

Telerobotics augmentation of Situation Awareness through Multimodal Interfaces

Jude Mukundane

Supervisor: Chris Csíkszentmihályi

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

Lígia Duro

Supervisor: Evangelos Karapanos, Teresa Romão 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

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

Mela Bettega

Supervisors: Maurizio Teli

Fostering the Spread of Ethical Digital Tools Through a Participatory-Based Approach

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

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)

Towards the Integration of service design methods and tools in software development process.

Rúben Gouveia

Supervisor: Evangelos Karapanos

Tracking in the Wild: Understanding User Engagement with Physical Activity Trackers

Sandy Rodrigues

Supervisor: Morgado Dias and Helena Ramos

Machine Learning Regression Model Generalization Accuracy in Photovoltaic System Monitoring

Sandra Olim

Supervisor: Valentina Nisi

Augmented Reality: A Tool to Improve Non-Formal Learning

Sara Tranquada

Supervisors: Chris Csíkszentmihályi and Nuno Correia (FCT/NOVA)

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

Sheikh Mostafa

Supervisor: Morgado Dias

Automated Sleep Apnea Hipoapnea Syndrome Detector

Vanessa Cesário

Supervisor: Valentina Nisi and António Coelho

Enhancing Museum Experiences through Games and Stories for Teenagers

PH.D. GRADUATIONS

M-ITI congratulates the Ph.D. students on their academic achievement.

Athanasios Vourvopoulos

Supervisor: Sergi Bermúdez i Badia

Using Brain-Computer Interaction and Multimodal Virtual-Reality for Augmenting Stroke Neurorehabilitation

Abstract

Every year millions of people suffer from stroke resulting to initial paralysis, slow motor recovery and chronic conditions that require continuous reha- bilitation and therapy. The increasing socio-economical and psychological impact of stroke makes it necessary to find new approaches to minimize its sequels, as well as novel tools for effective, low cost and personalized reha- bilitation. The integration of current ICT approaches and Virtual Reality (VR) training (based on exercise therapies) has shown significant improve- ments. Moreover, recent studies have shown that through mental practice and neurofeedback the task performance is improved. To date, detailed in- formation on which neurofeedback strategies lead to successful functional recovery is not available while very little is known about how to optimally utilize neurofeedback paradigms in stroke rehabilitation. Based on the cur- rent limitations, the target of this project is to investigate and develop a novel upper-limb rehabilitation system with the use of novel ICT technolo- gies including Brain-Computer Interfaces (BCI's), and VR systems. Here, through a set of studies, we illustrate the design of the RehabNet frame- work and its focus on integrative motor and cognitive therapy based on VR scenarios. Moreover, we broadened the inclusion criteria for low mobility pa- tients, through the development of neurofeedback tools with the utilization of Brain-Computer Interfaces while investigating the effects of a brain-to-VR interaction.

John Muñoz

Supervisors: Sergi Bermúdez i Badia, Mónica Cameirão and Élvio Gouveia

Supporting Physical Training in Healthy Older Adults Through Biocybernetic Adaptation and Exergaming

Abstract

Physical inactivity in older adults is commonly associated with the development of chronic diseases, poor maintenance of functional status, possible cognitive declines and the loss of physical independence. With the aim of reducing the social and economic burdens generated by the high percentages of older adults in the population, active aging programs have been intensively promoted. These programs, however, suffer from low rates of adherence and a lack of exercise's personalization that end up in demotivated older adults. Exercise videogames (Exergames) have been established as a fun and enjoyable method to promote physical activity, by using competition, timely feedback, and fun, they counteract the monotony of exercise routines. Although frequently attractive, the use of Exergames for exercise promotion in older adults still faces challenges in demonstrating effectiveness regarding functional fitness, cognitive functions, and game user experience. Moreover, the long-term effects of using Exergames as a structured exercise program in the older population have been rarely investigated. To tackle these limitations in Exergaming research, this thesis uses two different Human-Computer Interaction (HCI) techniques: human-centered design and physiological computing. The main objective is to maximize Exergaming effectiveness via: i) providing a more personalized, diversified and enjoyable game experience through custom-made Exergames and ii) optimizing the body responses while exercising with a physiologically intelligent software layer. First, a set of four Exergames that covers aerobic endurance, muscular strength and motor ability fitness domains were carefully designed via contextual design. Secondly, the biocybernetic loop construct from physiological computing is used to improve the cardiovascular performance of older adults through an Exergame that adapts its difficulty based on game performance and exertion levels, thus persuading players to exert in the desired and recommended levels. Two cross-sectional and two longitudinal controlled studies were completed in local senior gymnasiums with active older adults addressing multiple research questions to unveil the role of customized and adaptive Exergames in promoting physical activity. We demonstrated how attractiveness and effectiveness can be successfully combined in Exergaming design to deliver encouraging and motivating exercises that are equivalent (or sometimes better) to conventional training methods. Moreover, we illustrated the design of a set of physiological computing software tools that can be extensively used for biocybernetic adaptation in videogames, and physiological signal post-processing and interpretation.

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WORKSHOPS AND TALKS

TALKS

Physiologically Attentive User Interface for Robot Teleoperation
Gaganpreet Singh, January 22

Tracer la Lune d'un Doigt: A Physical Computing System for Interactive Piano Performance
Patricia Alessandrini, January 22

What is the Impact of Autonomous Robots in our Society?
Fabrizio Boriero, March 23

Developing the Individual Artist Through an Emphasis on Collaboration
Kelly Loosli, April 20

My Creative Process
Brooklyn Walker, April 20

Sociotechnical HCI and Service Design for Ethical Value Exchange
José Abdelnour-Nocera, July 11

Online Experimentation, IoT and IoHT
Teresa Restivo, July 13

A Holistic Approach to the Design of Digital Musical Instruments
Fabio Morreale, October 3

Third Wave HCI Research Enabling Interactive Music and Immersive Media Practice
Atau Tanaka, October 4

Designing Technologies for Survival: Touchstones for a Digital Future
Nishant Shah, November 20

How can we Build Systems that are More than Human but Better than Algorithms?
Nadia El-Imam, November 21

EVENTS

Entrepreneurs' City 2018
October 31-November 4

Science in the Market 2018
November 21

European Researchers' Night
September 28

Live Science in the Summer
September 3-5

Expomadeira 2018
July 6-15

COURSES

Introduction to Biomedical Signal Processing
António Ravelo, January 23

Augmented Reality in Museum Spaces
Vanessa Cesário, April 2-May 3

WORKSHOP

Progressive Products for Social Europe
November 19-23

SEMINARS & SYMPOSIA

SIIDS - Sound, Image, and Interaction Doctoral Symposium
M-ITI, Funchal, October 4

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

INVESTING IN THE FUTURE

M-ITI's primary goal is to keep investing in a professional infrastructure that promotes
innovation, warranting that the results of our research becomes relevant to companies and has impact in our economical environment. In 2015 M-ITI invested heavily to bring management and business development professionals. A new startup, created by PhD students, was spun off and won a H2020 SME-I contract, with coaching proved by M-ITI.

Attract and retain experienced researchers from other parts of the world that will develop their scientific careers in M-ITI and therefore contribute to build critical mass
and the internationalization and development of the University of Madeira, as well as to the outermost region of Madeira. This growth will be support by a two million euro grant from European funds, granted at the end of the year. International partnerships will be a pillar of M-ITI's medium and long term future, and we shall work on deepening intuitional links with CMU and University of Texas at Austin. M-ITI is seeking funds to allocate 1000 m2 of new lab space for the implementation of the Critical Technical Practice Lab. This new shared space for M-ITI's researchers will be contiguous and integrate seamlessly with the current facilities used for M-ITI'songoing projects.

Improving the innovation performance through a unique research infrastructure that will attract researchers and industry to the Madeira Interactive Technologies "Living Lab" and promote an economic impact through the successful creation and development of startups, spinoffs and industry-funded labs capable of generating new marketable interactive systems and service.

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