LARSyS
Laboratory of Robotics
and Engineering Systems

m·iti
Madeira Interactive
Technologies Institute

LEARNING FROM THE PAST.
CHALLENGING THE FUTURE.

Annual Report

2014

CONTENTS

Annual Report 2014

INTERDISCIPLINARY RESEARCH AND GRADUATE EDUCATION IN HUMAN-COMPUTER INTERACTION AND DESIGN INNOVATION IN MADEIRA ISLAND

ABOUT
THE INSTITUTE

"[...]I find the people and the ongoing research to be excellent, and I believe the institute will be able to establish itself as one of the top international research centers in the field. [...]" Prof. Dan Olsen, of Brigham Young University (USA), and
Prof. Erik Stolterman, of University of Indiana (USA), 2011

The Madeira Interactive Technologies Institute (M-iti) is a non-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 Laborator for Robotics and Systems in Engineering (LARSyS) since 2011.
M-iti operates in the interdisciplinar domain of Human-Computer Interaction (HCI), encapsulating contributions from the disciplines of computer science, psychology and social sciences, and design, with the goal of engaging in important scientific and technological challenges.
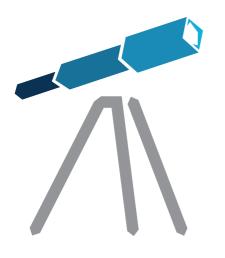
The location of M-iti provides a unique setting to deploy a Living Lab for Interactive Technologies, where systems and services can be tested using open-innovation frameworks.

VISION

Global changes - from climate to demographics; labor markets to capital flows; from sustainable resource management to energy efficiency; from smart technologies to pandemics - are happening at a pace that could not have been anticipated a few decades ago. These changes emerge from many different places and form the core of the major Horizon 2020 societal challenges. Our planet's newest mass extinction is being ushered in by the very same technologies and means of production that were the crowning accomplishments of our grandparents. It is clear that many of our pre-21st Century approaches must change swiftly and radically. Yet our habits of thinking, organizing, and living are largely configured to address the challenges and goals of prior epochs, and most of our tools still reflect and support those old habits.
We must mindfully design new materialities that foster the inclusive, innovative and reflective societies that will propel Europe to a sustainable future.

One important way to step into the new millennium is to develop 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. Yet even though so many of our social, cultural, and political structures remain relatively unchanged, the information age has produced technology that for the first time points towards ways of managing and responding to these societal challenges. In particular technologies of networking, sensing, and communication can act more flexibly and help mitigate the negative impacts of our industrial culture and consumerist lifestyle. They can update us in real time, and generate enough data upon which to build predictive models. They enable shared access to goods, data, services and talent generating new business models that challenge existing ones. They can increase global empathy, and help individuals, professionals, and society understand the consequences of decisions and actions. Networked ICTs are far cheaper, widely distributed, and egalitarian than their forbearers. They can enhance what has been termed "resilience" in the face of global change.

The long-term vision of M-iti, as an excellence center of design for global change, aims at identifying fresh approaches to the design of new technologies 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. Strategically placed at the intersection of the American, European and African sides of the Atlantic, M-iti is poised to play a crucial role in connecting, exchanging, and contributing to the innovation of three continents with whom Portugal enjoys a special relationship.

A multi-disciplinary Center combining natural and social scientists, engineers, humanists, and artists, its output will be focused on the area of applied science and human-centred technology. Leveraging the productive links between critical global capitals and an ultra-peripheral region, we will develop and share methods, working proofs, and "spin-off enterprises" focused on rebalancing the relationship of people and nature, production and consumption, local and global. At the same time, we will showcase the advantages of research and design situated outside of global capitals, including active research in and with the global south for which Madeira is one of the outposts for transnational EU cooperation.

In order to accomplish this vision, M-ITI will focus on developing techniques and technologies that:

• 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;

• 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;

• 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;

In the last ten years, we have seen a massive drop in the cost of communication. Through the Internet, telecommunications networks, and always-on personal devices, new forms of collaboration and shared activity have proven not just possible, but incredibly effective. The global Free Software movement, an early bellwether, has for example been able to provide the best available technologies in scores of research and commercial market sectors, all through distributed and largely non-hierarchical collaborative cooperation and labor. Sometimes called "participatory culture," this trend now manifests in many areas, and represents perhaps the most significant shift in means of production since the Industrial Revolution. It is also ideally suited to confronting global-scale problems. M-iti will take this approach in different test beds located in Madeira and elsewhere in European capitals that leverage the characteristics of these regions and will explore the cross pollination of research approaches, design techniques and technologies. 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. Broadly termed "Civic Media," 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 organization 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.
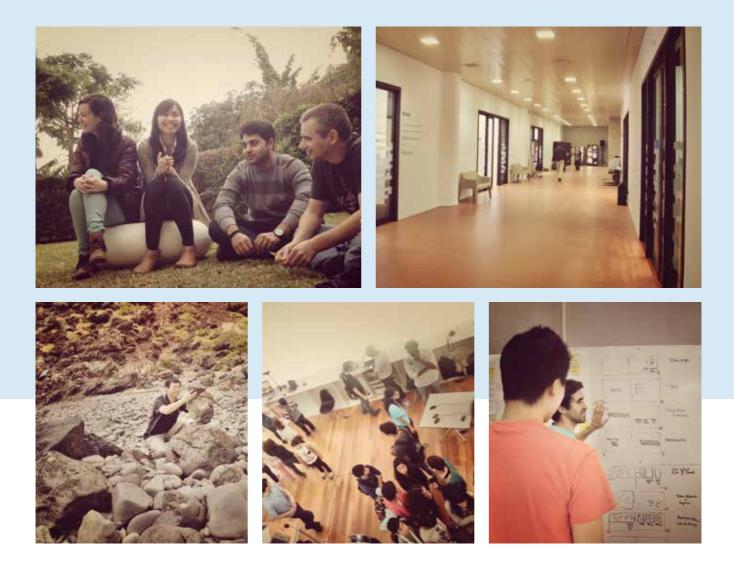
MESSAGE FROM
NUNO NUNES

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 2014 M-iti is currently associated with 22 integrated members, around 30 researchers (including PhD students) and a cohort of more than 120 master and post-grad students, supported by a dedicated group of five staff members. This vibrant and enthusiastic community comes form 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 2014. This year was another landmark in the history of M-iti. We started the year with a retreat that enabled a shared vision of the future of the institute in the light of the ERA Chair grant, which M-iti won in the pilot Horizon 2020 call. This and our recruiting efforts led to the hiring of Christopher Csikszentmihályi, a leading researcher in HCI and Design Innovation known for developing political technologies that rebalance power
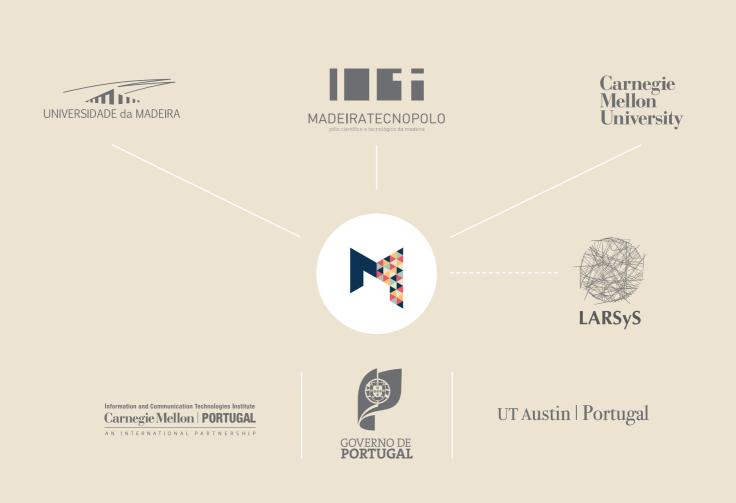
between citizens, corporations, and governments. During 2014 we also participated actively in the evaluation of LARSYS, the associated laboratory. We succeeded in passing to the second stage and hope that the evaluation panels of FCT will recognize our developing scientific performance as this report highlights.

The success of M-iti relies on the hard work and creativity of our dedicated community of researchers, students and staff. We believe that we should aim to become an excellence center in design for global change. We are positive that our recently appointed ERA Chair and his team will contribute to that ambition. We want to leverage our location because global changes often happen outside of or at the periphery of the EU, away from the decision centers where the excellence in research is concentrated. M-iti is particularly well positioned to showcase the advantages of research and design situated outside of global capitals, including active research in and with the global south for which Madeira is one of the outposts for transnational EU cooperation.

The challenges we face currently are to create a stable and supporting structure that could leverage M-iti as an international excellence center to enable it to compete with the top research initiatives in Europe and worldwide.

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.

UNIVERSIDADE da MADEIRA

MADEIRATECNOPOLO
pólo científico e tecnológico da madeira

Carnegie
Mellon
University

LARSyS

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

GOVERNO DE
PORTUGAL

UT Austin | Portugal

International Partnerships

LARSyS - Associate Laboratory of Robotics and Engineering Systems

LARSyS's 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, aeronautic 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), MARETEC, 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 enhancing 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 fulfillment.

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

PhD 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.

Evangelos Karapanos
Assistant Professor

PhD in Human-Computer Interaction from Eindhoven University of Technology. Focuses on the design and evaluation of pervasive computing systems with a focus on the experiential and social consequences of their adoption.

Bongkeum Jeong
Assistant Professor

PhD 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

Ian Oakley
Research Fellow

Assistant professor at the School of Design and Human Engineering at UNIST in South Korea where he runs the Interactions Lab. Research focuses on the design, development and evaluation of multi-modal interfaces and social technologies.

David Aveiro
Assistant Professor

PhD 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

José Luís Silva
Assistant Professor

PhD in Computer Science from the University of Minho. Interested in the identification of how prototypes can be used to explore the users' mobility and interaction to access services within ubicomp environments.

Jesús Ibañez
Research Fellow

PhD in Computer Science from University of Murcia, Spain. Interests are in intelligent user interfaces, affective computing, intelligent systems, interaction with virtual environments, virtual reality.

L. Constantine
Institute Fellow, Professor

Institute Fellow, Professor at University of Madeira. Principal Consultant of Constantine & Lockwood, Ltd.

Julian Hanna
Assistant Professor

PhD in English Literature from University of Glasgow. With interests in literature and place; experimental fiction; digital humanities; group dynamics.

Lina Brito
Assistant Professor

PhD in Telecommunication systems and eletrotecnical engineering from the University of Madeira. Focus are on Wireless Sensor Networks and Wireless Networks.

Karolina Baras
Assistant Professor

PhD in Information Systems and Technology from University of Minho. Karolina Baras was part of the research group Mobile and Ubiquitous Systems environments

Leonel Nóbrega
Assistant Professor

PhD in Computer Science from University of Madeira. Interested in Model-driven Software Engineering, Modeling Languages.

Luísa Soares
Assistant Professor

PhD 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 in M-iti

Morgado Dias
Assistant Professor

PhD in Electrical Engineering from University of Aveiro. Artificial Neural Networks. Editorial Board Member of International Journal of Control Science and Engineering. Has recently been elected President of the Portuguese Control Association.

Monchu Chen
Assistant Professor

Phd in Human-Computer Interaction from Carnegie Mellon University. Main research is on visual attention in interaction design, peripheral visual design, information visualization.

Nestor Catano
Assistant Professor

PhD in Computer Sciences from University of Paris. Interested in Formal Methods, Specification, Software engineering and Social Networks.

Mónica Cameirão
Assistant Professor

Postdoctoral researcher with a PhD in ICT and Audiovisual Media. Involved in the development and clinical assessment of pilot interactive technologies for neurorehabilitation.

Nuno Nunes
Associate Professor

PhD in Computer Science from University of Madeira. Research interest on designing, building and evaluating interactive systems and services. Spanning different areas of human life such as sustainability, design innovation and digital culture

Mónica Mendes
Assistant Professor

PhD in Digital Media from New University of Lisbon. As Digital Media Artist, the focus on scientific activity lies in Design and HCI, complementing with interactive environments, interface design and communication design.

Olga Lyra
Research Fellow

PhD in Inclusive Education from University of CologneEducational researcher with interests in persuasive technologies for educational and social inclusion.

Pedro Campos
Assistant Professor

PhD in Human-Computer Interaction, from University of Madeira Research interests lie upon Interaction Design, Augmented Reality, Agile Software Development Methods, Natural Interaction for Modeling and Inter- action Design Tools.

Simone Ashby
Assistant Professor

PhD 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.

Chris Csikszentmihályi
ERA Chair & Scientific Director

Distinguished Visiting Professor of Art & Design Research at Parsons New School of Design; Professor of Media Design Matters at the Art Center College of Design; Cofounded and directed the MIT Center for Future Civic Media, and was a professor and ran a research group at the MIT Media Lab, the Computing Culture Group.

Valentina Nisi
Assistant Professor

PhD 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.

Sergi Bermudez
Assistant Professor

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

Yoram Chisik
Assistant Professor

Phd in Communication Design from the University of Baltimore. Digital Media researcher that explores the nature and meaning of technological interactions in the digital age.

⬡ President　　⬡ Vice-President　　⬡ Program Director

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
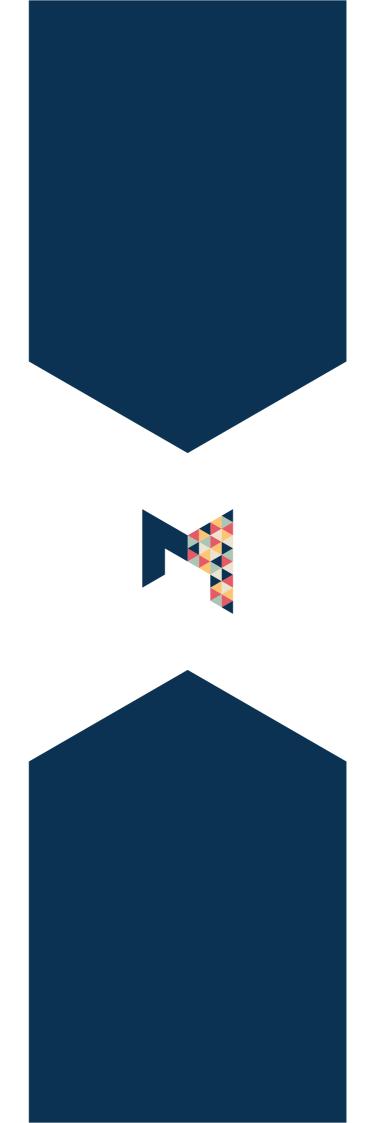
Substantially improve the RTD indicators of the Autonomous Region of Madeira and contribute to changing the economic and development paradigm, which is presently under enormous pressure due to the financial crisis.

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.

Living 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

According to the recommendations of M-iti's external advisory board following the thorough SWOT analysis M-iti was challenged 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 (...)" and provided the guidelines that lead to the current proposal suggesting "that the focus and vision exploits the specific characteristics of Madeira being an island and the local geographical expertise".

STRENGTHS

- High potential research faculty
- Institucional 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
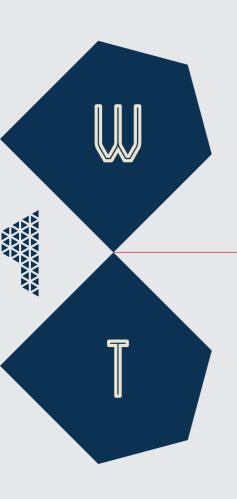
OPORTUNITIES

- Increased importance of HCI and design innovation in ICT
- Increased relavence for ERA ICT challenges
- Agility and empowerment of young research team
- Industry demand for design thinking
- Lower costs of research and availability of talent
- Recent hiring of ERA Chair

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, enterpreneurship and intellectual property management
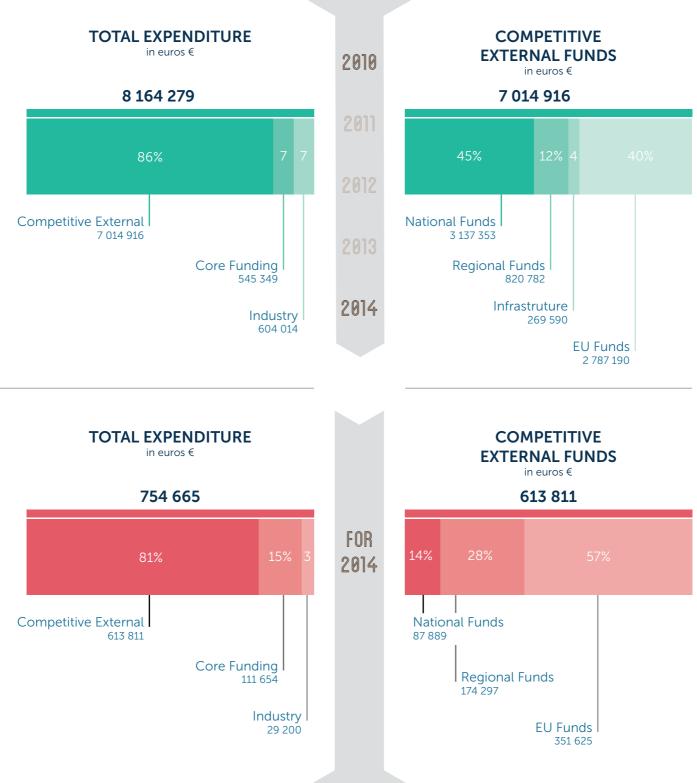
THREATS

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

FUNDING SOURCES

In the last five years M-iti raised more than 8M€ of external funding, mostly competitive. M-iti still depends a lot on competitive funding to support the research and academic activities. In 2014 the turnover was above 750K€ of which the majority is competitive EU funding.

2010
2011
2012
2013
2014

TOTAL EXPENDITURE
in euros €

8 164 279

86% | 7 | 7

Competitive External
7 014 916

Core Funding
545 349

Industry
604 014

COMPETITIVE EXTERNAL FUNDS
in euros €

7 014 916

45% | 12% | 4 | 40%

National Funds
3 137 353

Regional Funds
820 782

Infrastruture
269 590

EU Funds
2 787 190

FOR 2014

TOTAL EXPENDITURE
in euros €

754 665

81% | 15% | 3

Competitive External
613 811

Core Funding
111 654

Industry
29 200

COMPETITIVE EXTERNAL FUNDS
in euros €

613 811

14% | 28% | 57%

National Funds
87 889

Regional Funds
174 297

EU Funds
351 625

FOSTERING RESEARCH

Currently M-iti is involved in 14 funded research projects comprising a total funding of €7.562 MM Our current project portfolio spans the areas of neuro-rehabilitation, energy, digital culture and human-robot interaction.
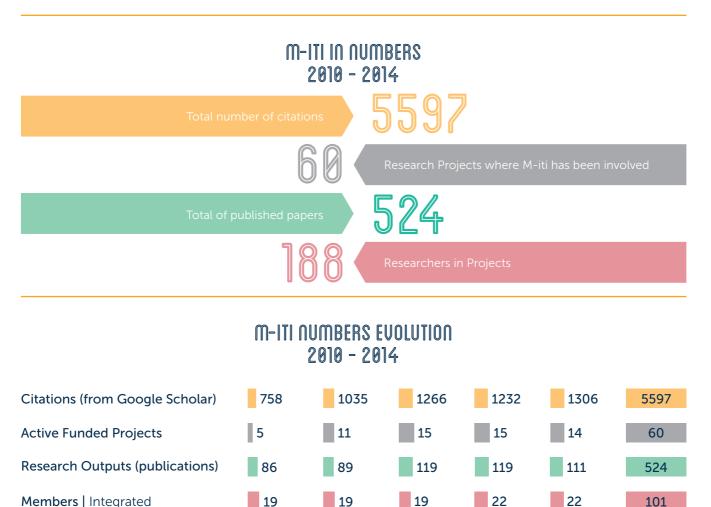The research performance keeps growing in 2014 the average number of research outputs and citations per integrated member was 5 and 59 respectively.

M-ITI IN NUMBERS
2010 - 2014

Total number of citations	**5597**
60	Research Projects where M-iti has been involved
Total of published papers	**524**
188	Researchers in Projects

M-ITI NUMBERS EVOLUTION
2010 - 2014

	2010	2011	2012	2013	2014	TOTAL
Citations (from Google Scholar)	758	1035	1266	1232	1306	5597
Active Funded Projects	5	11	15	15	14	60
Research Outputs (publications)	86	89	119	119	111	524
Members	Integrated	19	19	19	22	22	101
Hired Researchers	17	26	41	60	44	188

REHAB

Neuroscience Based Interactive Systems
for Motor Rehabilitation

http://neurorehabilitation.m-iti.org

This project is a collaboration between the M-iti, SESARAM and Myomo Inc. to develop a new generation of neuroscientifically grounded robot assisted training by means of novel interactive and gaming technologies for stroke patients.

myRehab provides a scientifically grounded rehabilitation training that adapts to the patient needs by adjusting game training parameters and the level of assistance of a portable neuro-robotic device.

Coordinator

Sergi Bermudez i Badia
(M-iti)

Researchers

Afonso Gonçalves, Ana Lúcia Faria,
André Ferreira, Andreia Andrade,
Davide Neves, Júlio Alves, John Muñoz,
Mónica Cameirão, Ruben Jardim,
Teresa Paulino, Athanasios Vourvopoulos

Partners	Funded by	Budget
M-iti, CMU, Myomo Inc. and the Hospital of Funchal	FP7- PEOPLE 2011- CIG	€100 000

AHA

Augmented Human Assistance

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

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 instills 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.

The technologies and techniques that we are proposing in this project are expected to lead to better adherence to training/rehabilitation, hence better and faster outcomes. Specifically, we are proposing personalization technologies that will adapt the physical training uniquely to each user and each exercise session in the context of an overall rehabilitation process. We will deploy our technologies in end user trials that explore various combinations of technology and user engagement.

Coordinators

Sergi Bermudez i Badia (M-iti)
Alexandre Bernardino (IST-ID)

Researchers

Monica Cameirão,
Élvio Rúbio Gouveia,
John Muñoz,
Afonso Gonçalves

Partners	Funded by	Budget
M-iti, IST-ID, CMU, FMH, YDreams, PLUX	FCT, CMUP-ERI/ HCI/0046/2013	€180 220

SLTAPHIT

Studying the Long-Term Acceptance of Personal Health Informatic Tools

http://www.m-iti.org/node/2474

Triggered by recent advances in sensor technology and ultra low power microcontrollers, the market of wearable activity trackers, such as Fitbit, Jawbone up, and Nike+ Fuelband, has grossed over $230M in 2013 and is expected to continue its growth. With chronic diseases such as diabetes, cardiovascular and respiratory diseases accounting for nearly 40% of mortality cases and 75% of health care costs, and obesity alone accounting for an estimated 12 percent of the health spending growth in the U.S., wearable activity trackers promise a new health care model that stresses patient-driven prevention.

Yet, researchers have raised concerns over the plausible wear-off of any initial effects on users' behaviors. A recent survey has found that over a third of owners of wearable activity trackers have discarded them within six months of use. It remains unclear whether this is because healthy routines became established or whether the trackers lost their appeal over time.
The goal of the project is to understand the factors that drive users' long-term engagement with wearable activity trackers, and to design new solutions for prolonged engagement.

Coordinator

Evangelos Karapanos
(M-iti)

Researcher

Ruben Gouveia

Partners	Funded by	Budget
M-iti, CMU, Folkwang University of Arts	FCT, CMUP-EPB/ TIC/0063/2013	€12 500

FFAB

Future Fabulators

http://futurefabulators.m-iti.org

The Future Fabulators (FFab) project aims to imagine, research, and prototype a range of possible futures, designed as artistic investigations and narrative artefacts to be experienced in the present. FFab uses techniques from physical narration, context-aware narrative, and future pre-enactment to translate future scenarios into storyworlds, which are built as immersive situations in public and private spaces and designed to be playfully explored and enacted by a broad population.

FFab research at M-iti is focused particularly on developing context-aware, multimedia, and transmedia stories. We investigate the contemporary panorama of creative media and translate stories of the future into artifacts of the present. Our goal, in close synergy with our FF partners, is to unfold the potential of technology and storytelling, blending tangible narrative, interactive technologies, and future forecasting.

Coordinator

Valentina Nisi
(M-iti)

Researchers

Julian Hanna, Mara Dionisio, Luis Ferreira, Paulo Bala, Rui Trindade

Partners	Funded by	Budget
M-iti, Time's Up, FoAM, AltArt	Culture Programme (2007-2013)	€50 000

Selected Publications & Exhibitions

Lucid Peninsula, interactive experimental art installation, (2014). Exhibited at Festival |on the reality of Dreaming and the Nightmare of Reality | Institute of Media Archeology IMA, Hainbourg, Austria, 26-28 september-2014.

Lucid Peninsula, the Vitality of Dreams (2014). Interactive experimental art installation, exhibited in Cluje, Romania, 03 -09 october.

Hanna, J.,M. Dionisio and Nisi, V "Possible Pasts, Possible Futures: Exploring Past and Future Scenarios Through Context-Aware Transmedia Stories", Data Ecologies, Linz, Austria, 05/2014. RTF Tagged XML BibTex Google Scholar

Hanna, J., T. Haldenby, T. Boykett, T. Auer, M. Kuzmanovic, N. Gaffney, I. Szakats, P. von Stackelberg, A. Chipperfield, and M. Peirano, Futurish: Thinking Out Loud About Futures, , Linz, Austria, Time's Up, pp. 240, 2014.

V. Nisi, J. Hanna, M. Dionisio, Exploring Ecosystem Services of the Macaronesian Laurel Forest Through Transmedia Storytelling, Culture(s) in Sustainable Futures: Theories, Practices and theories, International Conference, 6-8 May 2015, Helsinky , Finland

V. Nisi, J. Hanna, M. Dionisio, R. Trinidade, P. Bala, Time's Up, Lucid Peninsula: DreamScope An Interactive Physical Installation, Creativity & Cognition 2015 ArtWorks, Glasgow, Uk

---

AURERO

Human-Robot Interaction with Field Robots using Augmented Reality and Interactive Mapping

http://www.m-iti.org/aurero

Field robotics is the use of sturdy robots in unstructured environments. One important example of such a scenario is in Search And Rescue (SAR) operations to seek out victims of catastrophic events in urban environments. While advances in this domain have the potential to save human lives, many challenging problems still hinder the deployment of SAR robots in real situations. This project tackles one such crucial issue: effective real time mapping. To address this problem, we adopt a multidisciplinary approach by drawing on both Robotics and Human Computer Interaction (HCI) techniques and methodologies.

To achieve effective human-robot interaction (HRI), we propose presenting a pair of stereo camera feeds from a robot to an operator through an Augmented Reality (AR) head-mounted display (HMD). This will provide an immersive experience to the controller and has the capacity to display rich contextual information. To further enhance this display, we will superimpose mapping data generated by SLAM-6D (Simultaneous Localization And Mapping) algorithms over the video input using Augmented Reality (AR) techniques. Three modes of display will be available: (1) a top view 2D map, to aid navigation and provide an overview of spaces, (2) a rendered 3D model to allow the operator to explore a virtual model of the environment in detail, and (3) a superimposed rendered 3D model, synchronized with the field of view of the operator to form an augmented camera view. To achieve this latter mode we will track the angular position of the HMD and use it to both control the orientation of the robot's cameras and the rendering of the AR scene.

Coordinators
Ian Oakley (M-iti),
Rodrigo Ventura (IST)

Researcher
José Corujeira (M-iti)

Partners	Funded by	Budget
M-iti, IST-ISR	FCT PTDC/EIA-CCO/ 113257/2009	€61 718

Selected Publications

Immersive 3-D Teleoperation of a Search and Rescue Robot Using a Head-Mounted Display, Henrique Martins, Rodrigo Ventura, IEEE International Conference on Emerging Techonologies and Factory Automation (ETFA-09), Mallorca, Spain, 2009

Robust Autonomous Stair Climbing by a Tracked Robot Using Accelerometer Sensors, Jorge Ferraz, Rodrigo Ventura, International Conference on Climbing and Walking Robots (CLAWAR-09), Istanbul, Turkey, 2009.

Autonomous docking of a tracked wheels robot to its tether cable using a vision-based algorithm, Fausto Ferreira, Rodrigo Ventura, Workshop on Robotics for Disaster Response, ICRA 2009 - IEEE International Conference on Robotics and Automation, Kobe, Japan, 2009.

A Search and Rescue Robot with Tele-Operated Tether Docking System, C. Marques, J. Cristovão, P. Alvito, Pedro Lima, João Frazão, M. Isabel Ribeiro, Rodrigo Ventura, Industrial Robot, Emerald Group Publishing Limited, Vol. 34, No.4, pp. 332-338, 2007 , 2007.

RAPOSA: Semi-Autonomous Robot for Rescue Operations , C. Marques, J. Cristovão, Pedro Lima, João Frazão, M. Isabel Ribeiro, Rodrigo Ventura, Proc. of IROS2006 - IEEE/RSJ International Conference on Intelligent Robots and Systems, Beijing, China, 2006

AFFIDAVIT

Automating the Proof of Quality Attributes for Large Scale Software Systems

http://affidavit.dei.uc.pt

The Affidavit project is part of a major international effort (USA/EU) to develop tools and techniques to promote the widespread adoption of sound architectural practices in software engineering community, therefore aiming to increase global software quality.

Our goal is to make the current state of knowledge about software architecture design accessible to mainstream system developers by building a framework that will allow architects to investigate the properties of their architectures through architectural simulation and ensure their correct application through architectural

transformation. The simulation is based on architectural tactics and will support the achievement of quality goals as defined in quality attribute scenarios, by allowing an architect to determine the consequences of architectural decisions, and to maketradeoffs that balance competing quality requirements. Architectural transformation will ensure that the structure of the system built matches the designed and simulated behavior. This will open the way to computer-assisted design, migration and validation of large-scale software architectures.

Coordinator

Nuno Nunes
(M-iti)

Researchers

Amanda Marinho, Claudio Teixeira,
Mónica Nascimento

Partners	Funded by	Budget
M-iti, University of Coimbra, Carnegie Mellon University, Novabase	FCT Carnegie Mellon Portugal 2009	€137 928

Selected Publications

Ko-Hsun Huang, Nuno J. Nunes, Leonel Nóbrega, Larry Constantine and Monchu Chen, Hammering Models: Designing Usable Modeling Tools, INTERACT 2011, Lecture Notes in Computer Science, 2011, Volume 6948/2011, pp. 537-554, Springer 2011, DOI: 10.1007/978-3-642-23765-2_37

Palanque, P., Paternò, F., Nichols, J., Nunes, N. J., and Myers, B. A. 2013. The role of engineering work in CHI. In CHI '13 Extended Abstracts on Human Factors in Computing Systems (Paris, France, April 27 - May 02, 2013). CHI EA '13. ACM, New York, NY, 2477-2480. DOI= http :// doi. acm. org/10.1145/2468356.2468809

Alves R, Nunes N. 2013. Towards a Taxonomy of Service Design Methods and Tools. in Proceedings of the 4th International Conference, IESS 2013, Porto, Portugal, February 7-8, 2013. Lecture Notes in Business Information Processing Volume 143, 2013, pp 215-229 http :// dx. doi. org/10.1007/978-3-642-36356-6_16

Alves R, Nunes N, Valente P 2013. Improving Software Effort Estimation with Human-Centric Models: A Comparison of UCP and iUCP Accuracy, in Proceedings of the fifth ACM SIGCHI Symposium on. Engineering Interactive Computing Systems. City University London, UK, June 24–27, 2013. Best paper award at EICS

Alves R, Lim V, Niforatos E, Chen M, Karapanos E, Nunes N. 2012. Augmenting Customer Journey Maps with quantitative empirical data: a case on EEG and eye tracking. in Proceedings of the DIS '12 Designing Interactive Systems Conference 2012. Newcastle Upon Tyne, United Kingdom — June 11 - 15, 2012.

VISION 3D

VISION 3D projects aims at supporting research and development of image Optimizing and targeted display algorithms for medical context and optimize such algorithms for embedded application in "hardware" of small size, portable processing and low power. It is likely that this "hardware" be allocated to processing platforms based on FPGA (Field-programmable gate array).

Coordinator

Fernando Morgado Dias
(M-iti)

Researchers

Nuno Ferreira, Sheik Mostafa, Linda Natércia, Leonardo Reis, Fábio Batista

Partners	Funded by	Budget
M-iti, Awaiba	+ Conhecimento II do Programa Intervir +	€104 052

Selected Publications

Advanced illumination control algorithm in VHDL", Ricardo M. Sousa, Martin Wäny, Pedro Santos, Morgado-Dias, SPIE Sensing Technology + Applications, 2015.

Multi-camera synchronization core implemented on USB3 based FPGA platform", Ricardo M. Sousa, Martin Wäny, Pedro Santos, Morgado-Dias, BIOS, SPIE, 2015.

Multi-camera synchronization core implemented on USB3 based FPGA platform, Ricardo M. Sousa, Martin Wäny, Pedro Santos, Morgado-Dias, Electronic Imaging, Photonics West, SPIE, 2015.

SMART SOLAR

The SMART SOLAR is an online platform that aims to provide a forecast model, management and alerts the energy productivity of photovoltaic systems, based on automatic analysis of meteorological variables. This platform will be able to predict future production of individual installations and as a whole, also in order to enable better energy management, whether at the household level, as in the management of the electrical network.
The project focuses on the quality of services to optimize the operation and maintenance of renewable energy systems and to improve the efficient use of energy.

Coordinator

Fernando Morgado Dias
(M-iti)

Researchers

Ashkan Ramezani, Roham Torabikalaki,
Fabio Faria, Sandy Abreu,
Ana Caraban, Lucas Pereira

Partners	Funded by	Budget
M-iti, Factor Energia	+ Conhecimento II do Programa Intervir +	€107 122

Selected Publications

Abreu, S. R., M. Leça, X. Chen, and F. Morgado Dias, "On the Current Payback Time for Small Investors in the Photovoltaic Systems in the Region of Madeira", CONTROLO'2014 – Proceedings of the 11th Portuguese Conference on Automatic Control, vol. 321: Springer International Publishing, pp. 375-384, 2014

Pereira, L., F. Quintal, R. Gonçalves, and N. J. Nunes, "SustData: A Public Dataset for ICT4S Electric Energy Research", International Conference on ICT for Sustainability (ICT4S '14), Stockholm, Sweden, Atlantis Press, 08/2014.

EPIC

Escrita Produtiva, Criativa e Inteligente

http://placetowrite.com

EPIC (Productive, Creative and Smart Writing) is a R&D project dedicated to the design of an application of creative writing, combining minimalist interface design techniques with artificial intelligence algorithms (for strengthening and retrieval information) in order to allow greater inspiration in the creative act, an easy and more enjoyable use of this type of tools and a more direct search and manipulation of textual documents

Coordinator

Pedro Campos
(M-iti)

Researcher

Frederica Gonçalves

Partners	Funded by	Budget
M-iti, WOWSystems	+ Conhecimento II do Programa Intervir +	€107 122

Selected Publications

Campos, P., F. Gonçalves, M. Martins, M. Campos, and P. Freitas, "Second Look: Combining Interactive Surfaces with Wearable Computing to Support Creative Writing", Proceedings of the Ninth ACM International Conference on Interactive Tabletops and Surfaces [Acceptance Rate: 28%], Dresden, Germany, ACM, pp. 323−326, 11/2014

Campos, P., F. Gonçalves, M. Martins, M. Campos, and P. Freitas, "Second Look: Combining Wearable Computing and Crowdsourcing to Support Creative Writing", Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational [Acceptance rate: 25%], Helsinki, ACM, pp. 959−962, 10/2014

Buenafe, S., L. Guzman, N. Kannan, K. Mendoza, N. J. Nunes, V. Nisi, P. Campos, F. Gonçalves, M. Campos, andP. Freitas, "Yarn: A Product for Unraveling Stories", Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational, [Acceptance Rate: 28%], New York, NY, USA, ACM, pp. 1089−1094, 10/2014.

LEAPFROG

Enhancing the Research and Innovation Potential of M-iti through Human-Computer Interaction and Design Innovation

http://erachair.m-iti.org

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.

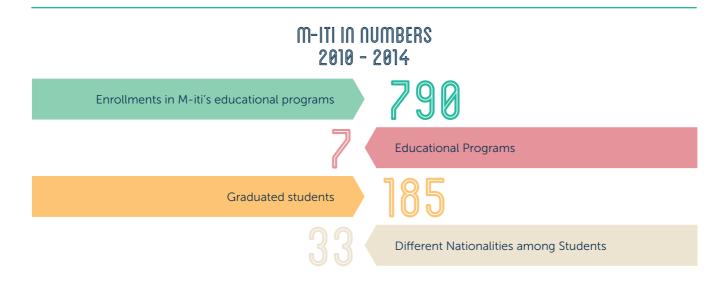## Coordinator

Nuno Nunes,
Chris Csikszentmihályi
(M-iti)

Partners	Funded under	Budget
M-iti	Fp7 Regpot ERACHAIRS 2013-1	€2 354 200

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 Lisbon, University of Porto, University of Texas in Austin.

M-ITI IN NUMBERS
2010 - 2014

Enrollments in M-iti's educational programs	790
7	Educational Programs
Graduated students	185
33	Different Nationalities among Students

EVOLUTION OF M-ITI STUDENTS
2010 - 2014

	2010/11	2011/12	2012/13	2013/14	2014/15	TOTAL
PAHT Bridging-program on Human Aspects of Technology	-	9	7	-	7	23
MEI MSc in Computer Science	80	91	77	172	89	509
MHCI Master in Human-Computer Interaction	29	28	23	18	15	113
MET Master of Entertainment Technology	6	12	8	8	7	41
DEI PhD in Computer Science	11	16	22	25	26	104

MHCI

Professional Master in Human-Computer Interaction

http://www.m-iti.org/mhci

A dual degree program, taught entirely in English, in collaboration with Carnegie Mellon University, Pittsburgh, USA. This 16-month international program aims to attract students from any continent and leads to two degrees awarded by Carnegie Mellon University and the University of Madeira.

Director
Simone Ashby

15 Number of students enroled in 2014

PROJECTS

TEAM FRONTIER

Maria Cabral, Somnath Chakravarty and Chrysoberyl Francisco

Team Frontier worked with Outsystems, a software enterprise company based in Lisbon, Portugal. Their main objective for this project was to understand citizen developer's needs, so that they could design an intuitive and usable development environment for them to create an application. Citizen developers are corporate professionals who are non-programmers but have experience with business intelligence tools.

http://frontier.m-iti.org

OutSystems provides the only open, high-productivity application platform (PaaS) that makes it easy to create, deploy and manage enterprise mobile and web applications - helping IT deliver innovative business solutions fast.

www.outsystems.com

TEAM SPARK

Alejandro Machado, André Aguiar, Arundhati Basu, Rui Marçalo

Wow! Systems approached the MHCI students to develop a project that was focused on promoting mental well-being through today's technologies. Team Spark presented findings from their research on daily routines and social network behaviors, which they have done over the course of the semester, as well as visions for creating prototypes during the following semester

http://spark.m-iti.org

Wow! Systems is a creative interactive multimedia agency and software house based in Funchal.

www.wowsystems.com

MET

Master in Entertainment Technology

http://www.m-iti.org/met

A dual degree program in collaboration with Carnegie Mellon University, Pittsburgh, USA. This international program, taught in English, starts with a semester at M-iti, followed by a semester at the Entertainment Technology Center and concludes with two more semesters at M-iti. At the end students are awarded two degrees, one by Carnegie Mellon University and one by University of Madeira.

Director
Monchu Chen

7 Number of students enroled in 2014

PROJECTS

TEAM FIRECREST

Luis Duarte Ferreira, Paulo Bala, Rui Rela, Rui Trindade, Sandra Olim

Firecrest is a Master of Entertainment Technology (MET) student project team working together with the Civil Protection of Madeira.
Our mission was to raise the awareness of the locals and tourists in Madeira about possible dangerous situations in levadas, helping them prevent and/or respond accordingly to said situations.

The SRPC, IP-RAM's mission is to prevent the risks inherent to situations of serious accident or disaster, as well as address the effects of such situations, rescuing people and protecting property.

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

www.procivmadeira.pt/

TEAM CREWCIAL

Ingrid Ecker, Marco Vieira, Rui Rela, Sandra Olim

The last chance to catch a memory of a certain place is right before you leave it. In a lot of cases the airport is the beginning and the end of an unforgettable journey and a perfect way to connect one last time with the destination. In this particular case we are referring to the airport of Madeira. Madeira, a tiny Portuguese island in the Atlantic Ocean best known for its remarkable natural environment.
Their mission was to create an engaging experience that allows you at the same time to contribute to the preservation of the natural environment of Madeira.

Aeroportos da Madeira is the entity that manages the airport infrastructures in Madeira Island.

http://crewcial.m-iti.org

www.ana.pt

TEAM FUSEBOX

Luis Duarte Ferreira, Paulo Bala, Ratchpak Pongmongkol, Rui Trindade

Interactive museum experience, aimed at younger audiences, that demonstrates how different energy scenarios impact communities and their environments, and encourages people to evaluate their own energy consumption habits.

http://fusebox.m-iti.org

The partner on this project was the - "Museu Casa da Luz"

www.museucasadaluz.com

PAHT

Bridging-program on Human Aspects of Technology

http://www.m-iti.org/baht

This is a one-year bridging program, in which students have the opportunity to work in multidisciplinary and multicultural teams. This graduate program is extremely valuable because of the different areas of knowledge that students obtain in the field of Human-Computer Interaction. Students accepted for this program usually come from different areas such as design, art, communication, social sciences, etc.

Director
Luísa Soares

7 Number of students enroled in 2014

PROJECT

Heuristics and counterfactual thinking
Michael Silva and Psychology undergraduate Students

Aimed at proving the application of heuristics within daily life, students proceeded to undertake some experiments: availability heuristics, representative heuristics and counterfactual thinking.

MEI

MSc in Computer Science

http://www.m-iti.org/mei

The Master of Science degree in Computer Science is a program in the Bolonha agreement and offers a degree awarded by the University of Madeira. Computer Engineering is currently present in all areas essential to economical and social advancement. Whether developing information visualisation tools, air traffic or ambulance control systems, this branch of engineering has a determinant impact on the decisions that affect our daily lives. It is a collaborative, interdisciplinary activity which requires transversal skills at the level of management, technology, leadership and imagination. Computer engineers shall be able to: conceive, shape, develop, operate and maintain computer applications, information systems, computational architectures and data networks; Deal with complexities and abstraction, and to easily adapt to the constant technological changes in this area.

Director
Karolina Baras

89 Number of students enroled in 2014

DEFENDED THESIS - 2014

António Gonçalves

Bluestation 2: Reengenharia de um sistema de disseminação de mensagens.

Supervisors:
Leonel Nóbrega and Luís Gomes

•

Bárbara Florença

Matematutor - Aplicação Educativa de 4.º ano de Matemática.

Supervisor:
Néstor Cataño

•

Carlos Figueira

DEMO models based automatic workflow process generation.

Supervisor:
David Aveiro

•

César Dias

Breadcrumbs: Location and context aware mobile platform for story sharing.

Supervisors:
Valentina Nisi and Nuno Jardim Nunes

Diamantino Ferreira

Using Neo4j for Geospatial Data Storage and Integration.

Supervisor:
Karolina Baras

•

Emanuel Sousa

Sistema de Gestão de Rondas.

Supervisor:
Néstor Cataño

•

Joana Pereira

Cozinha da Madeira web - the online touchpoint for a sustainability
oriented service for Madeira Island.

Supervisors:
Valentina Nisi and Nuno Jardim Nunes

•

João Luís

FXBus - Uma Aplicação Móvel para Combater a Ansiedade.
de Perder o Autocarro

Supervisors:
Leonel Nóbrega and Luís Gomes

•

José Teixeira

Need Fulfillment and Experiences on Social Media: A case on Facebook and WhatsApp.

Supervisor:
Evangelos Karapanos

•

Mara Dionísio

7 Stories: Location Based Story-Delivery System

Supervisor:
Valentina Nisi

•

Maria Ferreira

Predicting and Breaking Sedentary Behaviour at Work.

Supervisor:
Evangelos Karapanos

•

Nuno Rodrigues

Activity Modeling in practice: a case-based guide to human-centered software engineering.

Supervisor:
Leonel Nóbrega

•

Roberto Jesus

Desenvolvimento de Serviços de Publicação de Anúncios Publicitários na AdBiz.

Supervisor:
Eduardo Fermé

•

Roberto Dias

ADAPTNOW revamped look for the web.

Supervisor:
Sergi Bermúdez

Artur Vieira

RehabNet - A social network for the deployment of online rehabilitation

Supervisor:
Sergi Bermúdez

•

Rubina Castro

Applying DEMO to Model a Process and Automate it in a Workflow System
A Case Study in a City Hall

Supervisor:
David Aveiro

•

Vítor Belim

BlueFriends: Measuring, analyzing and preventing social exclusion
between elementary school students

Supervisor:
Evangelos Karapanos

•

Vítor Nóbrega

WAMM Wiki Aided Meta Modeling

Supervisor:
David Aveiro

•

Vítor Almeida

3D Reconstruction Through Photographs

Supervisors:
Eduardo Fermé and Luís Gomes

PDMD

PhD in Digital Media

http://www.m-iti.org/pdmd

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 PhD 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 PhD 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.

Director
Valentina Nisi

NETSYS

PhD in Networked Interactive Cyber Physical Systems

http://www.m-iti.org/netsys

This is a 4-year PhD program, where 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 expertize and skills in cyber-physical interactive systems. This PhD 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 PhD 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 analyze complex situations and to propose new solutions, as well as giving them the ability to manage multidisciplinary teams.

Director
Nuno Nunes

PHD STUDENTS

M-iti offers doctoral programs in collaboration with University of Madeira, University of Lisbon, University of Porto, New University of Lisbon, University of Texas in Austin and Carnegie Mellon University.
Our current cohort of PhD students follows.

Afonso Gonçalves

Augmented Assistive Exergames: Healthy Exercising Through Adaptive Games in a Spatial Augmented Reality

Supervisor:
Sergi Badia i Bermúdez (M-iti)

•

Amanda Marinho

Sharing Economy: when the collective became better than the ownership.
An investigation about goods and service design amenable for collaborative consumption.

Supervisor:
Nuno Nunes (M-iti)

•

Ana Lúcia Faria

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

Supervisors:
Salomé Pinho (Univ. Coimbra) and Sergi Bermúdez i Badia (M-iti)

•

Augusto Esteves

Understanding Epistemic Actions in Human-Computer Interaction

Supervisors:
Ian Oakley (M-iti)

•

Athanasios Vourvopoulos

Multimodal Neuro-Robotic VR system for Stroke Rehabilitation

Supervisor:
Sergi Bermúdez (M-iti)

•

Christian Koehler

Motivation Behavior Change in Climate Control Systems.

Supervisor:
Ian Oakley (M-iti)

Clinton Jorge

Improving Adoption and Awareness of Pervasive Public Displays.

Supervisors:
Valentina Nisi and Nuno Nunes (M-iti)

•

Duarte Gouveia

Executable Model Ontology for Temporal Intelligent Organizations in Network Systems

Supervisor:
David Aveiro (M-iti)

Evangelos Niforatos

An Experience Sampling Tool for the Evaluation of Pervasive Computing Applications.

Supervisor:
Evangelos Karapanos (M-iti)

•

Filipe Quintal

Exploring the dimensions of eco-feedback technology in the wild.

Supervisors:
Valentina Nisi and Nuno Nunes (M-iti)

•

Frederica Gonçalves

Designing and evaluating creative writing environments: a directed storytelling, ethnography-based approach.

Supervisor:
Pedro Campos (M-iti)

•

Hildegardo Noronha

Interoperable Exoskeletons for Improved Immersion, Plausibility and Performance: a Haptics-based Approach.

Supervisor:
Pedro Campos (M-iti)

Per Jakob Rogstadius

Enhancing Disaster Situational Awareness
Through Scalable Curation of Social Media

Supervisors:
Evangelos Karapanos (M-iti) and
Vassilis Kostakos (Oulu University, Finland)

Jayant Venkatanathan

Examining the Interplay Between Universal
Behavioural Tendencies, Online Social
Networks and Social Capital

Supervisors:
Evangelos Karapanos (M-iti) and
Vassilis Kostakos (Oulu University, Finland)

John E. Muñoz

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

Supervisor:
Sergi Badia i Bermúdez (M-iti)

Ken Keane

Spatial Narrative as an Interaction Resource
Towards the Discovery and Sharing of Place.

Supervisor:
Valentina Nisi (M-iti)

Lucas Pereira

Hardware and software platforms for energy
monitoring and eco-feedback research.

Supervisors:
Nuno Nunes (M-iti) and
Mario Bergés (Carnegie Mellon University)

Maria José Ferreira

Measuring the impact of inclusive educational
interventions on students' development
through wearable sensor technology

Supervisor:
Evangelos Karapanos (M-iti)

Pedro Valente

Adaptation of the software development
effort to the organization's return
of investment capabilities

Supervisors:
Nuno Nunes and David Aveiro (M-iti)

Ruben Gouveia

Understanding users' engagement
with activity trackers.

Supervisor:
Evangelos Karapanos (M-iti)

Rui Alves

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

Supervisor:
Nuno Nunes (M-iti)

Tasos Spiliotopoulos

Application of social network analysis
techniques for studying behaviour in social
network sites.

Supervisor:
Ian Oakley (M-iti)

PHD GRADUATIONS

Ijaz Ahmed
On the Formal Verification of Specifications based on Typestates with Access Permissions.

Supervisor:
Evangelos Karapanos, 2012

Mary Barreto
Social Translucence as a theoretical framework for sustainable HCI.

Supervisor:
Evangelos Karapanos, 2014

Michelle Scot
Motivating Sustainable Behaviour Change Through Technical Interventions.

Supervisor:
Ian Oakley, 2013

Victor Rivera
FAVAS: A Formal Verification Platform for Real-time Systems.

Supervisor:
Néstor Cataño, 2014

Sorren Hanvey
A Formal Methods approach for checking of Social Network privacy policies.

Supervisor:
Néstor Cataño, 2013

PHD THESIS | Abstracts, 2014

Mary Barreto   Supervisor: Evangelos Karapanos and Nuno Nunes (M-iti), 2014

Towards the design of Eco-Feedback Technologies for Families.

Increasing levels of pollution and carbon emissions have generated an interest in developing interventions strategies to reduce these levels, particularly with regard to residential energy consumption. Within Human-Computer Interaction (HCI), this increased interest has been reflected in the update of the so-called eco-feedback technologies, ones that provide feedback on individual or group behavior with the goal of increasing awareness to reduce environmental impact. However, much of the work on sustainability within HCI has treated eco-feedback technologies as a single-user interaction problem, thus disregarding the role families have on affecting their members' behaviors. This thesis seeks to analyze the impact of eco-feedback technology in households in terms of their energy consumption practices and routines, as well as their communication and coordination patterns around energy consumption. We employ the Social Translucence framework (Erickson & Kellogg, 2000) as a

theoretical lens adopted for the design of systems that can reach family units through the action of three properties: visibility, awareness and accountability. This work has demonstrated families have specific motivations for sustainable behaviors related to their household role, values and with the education of their children. Eco-feedback technologies increased visibility and awareness of energy consumption behaviors by enhancing its presence within family discussions. The technology supported family members with data to confront others, but also, through which they felt accountable. Family members preferred condensed, contextualized and indirect feedback information. Feedback that indicated directly actors of consumption or generated inferences was seen as a source of conflicts within the households. This works goal is to provide design guidelines and implications for the human-computer interaction community in terms of the design of eco-feedback systems that fit families characteristics. On an added level, promote higher levels of engagement and behavior change in the long term by educating the next generations.
Keywords: Human-Computer Interaction, Sustainability, Eco-feedback, Families, Family members, Social Translucence, Motivations.

Victor Rivera   Supervisor: Néstor Cataño (M-iti), 2014

Code Generation for Event-B

Stepwise refinement and Design-by-Contract are two formal approaches for modelling systems. These approaches are widely used in the development of systems. Both approaches have (dis-)advantages: in stepwise refinement a model starts with an abstraction of the system and more details are added through refinements. Each refinement must be provably consistent with the previous one. Hence, reasoning about abstract models is possible. A high level of expertise is necessary in mathematics to have a good command of the underlying languages, techniques and tools, making this approach less popular. Design-by-Contract, on the other hand, works on the program rather than the program model, so developers in the software industry are more likely to have expertise in it. However, the benefit of reasoning over more abstract models is lost.
A question arises: is it possible to combine both approaches in the development of systems, providing the user with the benefits of both? This thesis answers this question by translating the stepwise refinement method with Event-B to Design-by-Contract with Java and JML, so users can take full advantage of both formal approaches without losing their benefits. This thesis presents a set of syntactic rules that translates Event-B to JML-annotated Java code. It also presents the implementation of the syntactic rules as the EventB2Java tool. We used EventB2Java to translate several Event-B models. The tool generated JML-annotated Java code for all the considered Event-B models that serve as final implementation. We also used EventB2Java for the development of two software applications. Additionally, we compared EventB2Java against two other tools that also generate Java code from Event-B models. EventB2Java enables users to start the software development process in Event-B, where users can model the system and prove its consistency, to then transition to JML-annotated Java code, where users can continue the development process.

SELECTED PUBLICATIONS

Silva, J. C., and J. L. Silva, "A Methodology for GUI Layer Redefinition through Virtualization and Computer Vision", Computational Science and Its Applications (ICCSA), 2014 14th International Conference on, pp. 58-63, June, 2014.

Keane, K., and V. Nisi, "Experience Prototyping: Gathering Rich Understandings to Guide Design", Emerging Research and Trends in Interactivity and the Human-Computer Interface, issue Hershey, PA, USA: IGI Global, pp. 224 - 237, 2014.

Mendes, M., P. Ângelo, and N. Correia, "Hug@ree: An ARTiVIS Experience for Sustainability", Leonardo, vol. 47, issue 5: MIT Press, pp. 500 - 501, 2014.

Anslow, C., P. Campos, and A. Ferreira, "Collaboration Meets Interactive Surfaces: Walls, Tables, Tablets, and Phones (CMIS (workshop)", Proceedings of the Ninth ACM International Conference on Interactive Tabletops and Surfaces [Acceptance rate: 28%], Dresden, Germany, ACM, pp. 495?498, 11/2014.

Vourvopoulos, A., A. L. Faria, K. Ponnam, and S. Bermudez i Badia, "RehabCity: Design and Validation of a Cognitive Assessment and Rehabilitation Tool through Gamified Simulations of Activities of Daily Living", 11th Advances in Computer Entertainment Technology Conference, 11/2014.

Campos, P., F. Gonçalves, M. Martins, M. Campos, and P. Freitas, "Second Look: Combining Interactive Surfaces with Wearable Computing to Support Creative Writing", Proceedings of the Ninth ACM International Conference on Interactive Tabletops and Surfaces [Acceptance Rate: 28%], Dresden, Germany, ACM, pp. 323-326, 11/2014.

Niforatos, E., A. Vourvopoulos, M. Langheinrich, P. Campos, and A. Dória, "Atmos: A Hybrid Crowdsourcing Approach to Weather Estimation", ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp'14), Seattle, Washington, US, 09/2014.

Chen, M., Y. - C. Huang, and K. - Y. Mao, "Gaze-Based Drawing Assistant", The 41st International Conference and Exhibition on Computer Graphics and Interactive Techniques, SIGGRAPH?14, Vancouver, Canada, 08/2014.

Lucero, A., E. Karapanos, J. Arrasvuori, and H. Korhonen, "Playful or Gameful?: creating delightful user experiences", ACM Interactions, vol. 21, issue 3, no. 3: ACM, pp. 34?39, 05/2014.

Quintal, F., C. Jorge, V. Nisi, N. J. Nunes, and M. Mendes, "Watt-a-Feeling - Raising Energy Production Literacy Through a Tangible Installation", AVI 2014 International Working Conference on Advanced Visual Interfaces [FSEA Workshop], Italy, 05/2014.

Silva, J. L., J. C. Campos, and M. D. Harrison, "Prototyping and analysing ubiquitous computing environments using multiple layers", International Journal of Human-Computer Studies, vol. 72, issue 5, pp. 488-506, 03/2014.

Hanna, J., C. Jorge, V. Nisi, N. Nunes, M. Caldeira, G. Innela, and A. Marinho, "Island Stories: The Madeira Story Generator Project", New Writing: The International Journal for the Practice and Theory of Creative Writing, vol. 11, issue 1, 02/2014.

Hanna, J., T. Haldenby, T. Boykett, T. Auer, M. Kuzmanovic, N. Gaffney, I. Szakats, P. von Stackelberg, A. Chipperfield, and M. Peirano, Futurish: Thinking Out Loud About Futures, Linz, Austria, Time's Up, pp. 240, 2014.

Campos, P., A. Lopes, T. Clemmensen, and J. Abdelnour-Nocera, "Human Work Interaction Design for Pervasive and Smart Workplaces", Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational, New York, NY, USA, ACM, pp. 825?828, 2014.

Koehler, C., N. Banovic, I. Oakley, J. Mankoff, and A. K. Dey, "Indoor-ALPS: An Adaptive Indoor Location Prediction System", Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing, New York, NY, USA, ACM, pp. 171-181, 2014.

Oakley, I., and D. Lee, "Interaction on the Edge: Offset Sensing for Small Devices", Proceedings of the SIGCHI Conference on Human Factors in Computing Systems [Acceptance Rate: 23%], New York, NY, USA, ACM, pp. 169-178, 2014.

Esteves, A., F. Quintal, and I. Oakley, "TouchCloud: An Exploratory Study in Physically Tagging the Cloud", International Conference on Tangible, Embedded and Embodied Interaction, 8th: ACM, 2014.

Bermudez i Badia, S., "Virtual Rehabilitation: Beyond Gaming", CyberTherapy & Rehabilitation Magazine, vol. 2014, issue 2, 2014.

Quintal, F., L. Pereira, N. J. Nunes, and V. Nisi, "What-a-Watt : Where does my electricity comes from?", International Working Conference on Advanced Visual Interfaces (AVI '14) [Demo], Como, Italy, 2014.

Gomes, T., T. Abade, M. D. Harrison, J. C. Campos, and J. L. Silva, "[Accepted] A Virtual Environment based Serious Game to Support Health Education ", EAI Endorsed Transactions on Ambient Systems, 2014.

Liu, Y., J. Venkatanathan, J. Goncalves, E. Karapanos, and V. Kostakos, "Modeling What Friendship Patterns on Facebook Reveal About Personality and Social Capital", ACM Trans. Comput.-Hum. Interact. vol. 21, no. 3, New York, NY, USA, ACM, pp. 17:1-17:20, 2014.

WORKSHOPS AND TALKS

WORKSHOPS

Information Visualization
Robert Spence, from January 13th to the 17th 2014.

FoAM
Maja Kuzmanovic, from January 16th and 17th 2014

Agile Interaction Design and Development
Larry Constantine, from February 17th to the 28th 2014

Kinetic Typography
Dan Boyarski, from March 17th to the 28th 2014.

Hands on Filming MFF
Chris Peters and Theron Patterson,
from April 12th to the 19th 2014

Videomaking
Diego Nicoletti, from September 8th to the 12th 2014

Design Thinking Method & Design Ethnography
Sophie Buergin, in September 12th 2014

Yoga and Meditation: theory and practice
David Aveiro, in November 19th 2014

Professional Communications in English
Katherine Pugh, in November 28th

TALKS

"Drawing Alternative Present and Future Speculative"
James Auger, in April 30th 2014

A service-oriented Perspective on HCI
Jodi Forlizzi and Steven Dow, in May 7th 2014

**'TOUCHCLOUD'- providing physical handled
to cloud data**
Filipe Quintal, in May 20th 2014

**AQUAMUSA' - mapping system of stories to express
the identity of the territory**
Andrea Di Nardo, in May 20th 2014

**"Research on Bioapplications and Renewable Energy in
Instituto para ela Desarrollo Tecnológico y la Innovación
en Comunicaciones IDeTIC-Universidad
de las Palmas de Gran Canaria"**
Carlos Travieso in October 21st 2014

**Clench Strength Prediction for Prosthesis Hand
using Surface Electromyography**
Sheikh Shanawaz Mostafa, in November 5th 2014

**Software application for evaluating and implementing
photovoltaic microproduction in buildings**
Fábio Faria, in November 5th 2014

**Development of an Algorithm to Optimize the
Coordinated Charging Process
of a Group of Electric Vehicles**
Roham Torabikalaki, in November 11th 2014

**Cost-benefit Assessment of Nearly-Zero Energy House
Generation and Consumption Matching
Using Energy Storage**
Ashkan Ivaki, in November 11th 2014

Digital Culture and Community
Eric Craven, in November 12th 2014

**Flutrack.org: Crowdsourcing Status-Updates
in Public Health**
Konstantinos Chorianopoulos, in December 11th 2014

SEMINARS & SYMPOSIA

**2-day Seminar: Fundamentals
of Biomedical Digital Signals**
António Ravelo, from July 7th to the 8th 2014

2-day Seminar: Intellectual Property and Copyright
Gabriella Reniero and Giovanni Casucci,
from November 17th to the 18th 2014

Symposium: Prototyping the Intangible
M-iti Faculty and Invited Professors,
from November 8th to the 9th 2014

INVESTING
IN THE FUTURE

M-iti's primary goal is to create a professional infrastructure that promotes innovation, warranting that the results of our research becomes relevant to companies and has impact in our economical environment.
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.

M-iti will allocate 1000 m2 of new lab space for the implementation of this living laboratory. This new shared space for M-iti's researchers is contiguous and integrates seamlessly with the current facilities used for M-iti's ongoing 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.