

Paraíba is officially Digiscope ready!



For the fourth consecutive time, IT in Porto was present in the Caravana do Coração initiative. Around 60 healthcare professionals went on a 13 day campaign through the state of Paraíba to screen for cardiac diseases in children.

According to Pedro Gomes (IT), "This year alone, we served 1908 patients and made 10795 clinical procedures". Sharing his experience he added that "the Caravana is a crazy journey where every day is apparently the same. You wake up at 6AM to go to the field hospital and assemble your station, you meet around 150 patients during the next 10 to 12 hours, you pack everything back in the bus and go to the next city. There, a welcome party is expecting you, full of food, music and laughter, and you just want to rest, eat your first meal of the day, and sleep. In a good day you can go to bed around midnight, most days at 1AM". Pedro Gomes, revealed the true spirit of this initiative, "a hard 13 days of volunteer work with just one big goal: to improve the quality of life of these children. To me, it is a place where I have found that you get more than what you give". In a 10-year collaboration, the group from IT in Porto has been developing interactive auscultation screening tools to help support the professionals that work to ensure these children's health.

The IT researcher says that "This year we expanded their telemedicine capabilities to include digital auscultation for potentially all of Paraíba's 40k births per year. Our job was to install 3 fixed and 3 mobile DigiScope stations and to train all the potential users throughout the state. With 44 professionals trained and 12 cities using the technology, Pedro Gomes states that "Paraíba is now officially Digiscope ready!"

Editorial

New knowledge, needed to create new products and services, is research output. In order to build a virtuous circle some of the revenues generated by the new products and services should be fed back into research.

This feedback operation may take the form of research state subsidies (funded by taxes) or royalties generated by intellectual property rights (IPR) out of research outputs.

In Portuguese research units, IPR management is still in its infancy and royalties are a very minute fraction of research funding. Patent writing, required to protect IPRs, is not a favourite subject among researchers and, occasionally, may even conflict with a far more popular (and prestigious activity) journal paper writing. Most Portuguese universities nowadays have a small patent office and are exempt from some patenting charges but do not have the means to detect, much less, fight patent violation. Extending the same patent charge exemption to private non-profit research units would, at least, give a little incentive to increase the number of patent requests, that is still very low by European standards.

But what could really make a difference would be to put together the existing means into a sizeable and more muscular unit, that would serve all state high education bodies and private non-profit research units.

Carlos Salema



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IT is a private non-profit association of Universities (UA, UC, IST, UBI, UP, ISCTE-IUL), Polytechnic of Leiria, Altice Labs and Nokia, with a mission to create and disseminate scientific knowledge in telecommunications. IT hosts and tutors graduate and postgraduate students.

Send your news and contributions for this newsletter to: news@it.pt

Edition: João Santos

Coordination: Carlos Fernandes

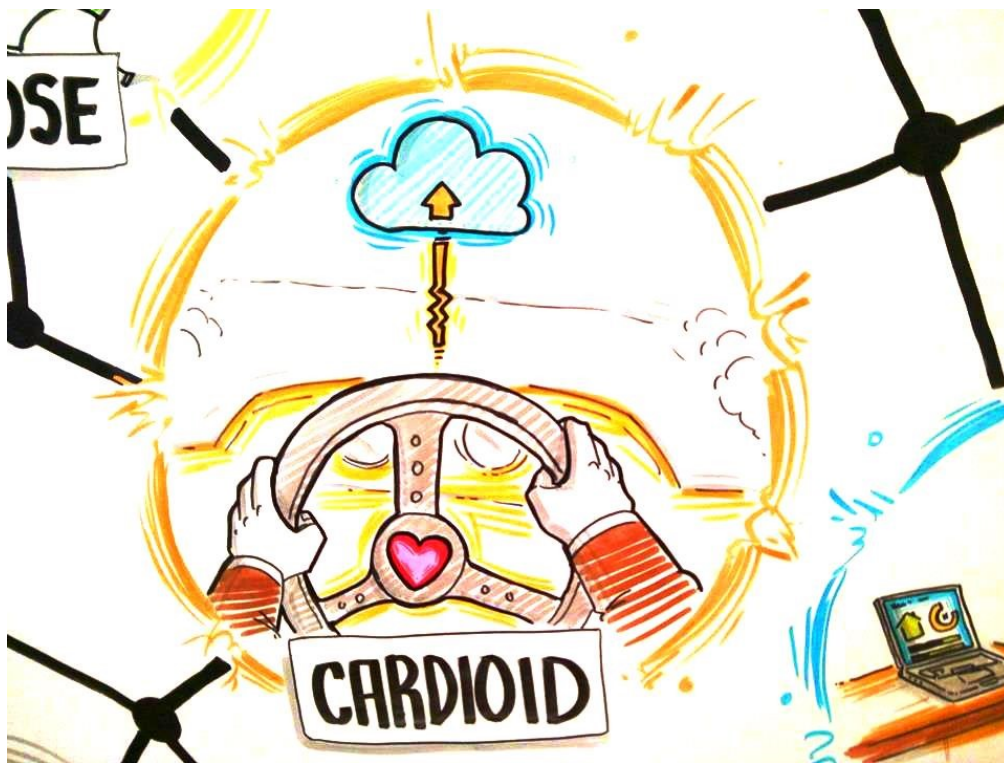
Mário Figueiredo's *hat-trick* as a Highly Cited Researcher

For the third year in a row, Mário Figueiredo, from IT, appears in the 2016 Thomson Reuters list of Web of Science Highly Cited Researchers. After saying that “the fact that this is happening for the third consecutive year makes me especially proud”, Mário Figueiredo shared the merits with “students and colleagues, among whom I would like to mention José Biucas-Dias (IT and IST-UL) as well as Robert Nowak and Stephen Wright (both from the University of Wisconsin, USA).” Finally, the IT researcher stressed that “since the inclusion criterion uses citation data of papers from the past 10 years, the time constants involved in this process are of the order of decades”, concluding that “High impact research is a long-term endeavour”.



PROJECT SNAPSHOT

CardioID places your heart in your hands



“I took my heart and placed it in my hands”, is the beginning of a poem written by Fernando Pessoa. While this might seem like an impossibility we can only experience through poetry, sometimes, like Richard Dawkins said, “Science is the poetry of reality”. And since science is in the business of turning the impossible into possible, at CardioID (www.cardio-id.com), a spin-off from IT, they have developed a technology that does exactly that, places your heart in your hands. According to André Lourenço, IT researcher and one of the co-founders of CardioID, “we have developed hardware and software to process ECG signals acquired from the hands in a non-intrusive way”. This technology uses dry electrodes, conductive textiles or other materials that can be incorporated in daily objects. It all started during André’s PhD project, under the supervision of Ana Fred (IT), who was also coordinating the IT project VITALIDI. In 2013, the project won the first place in Acredita Portugal, a visibility that André, Ana Fred, Priscila Alves, Carlos Carreiras and José Guerreiro took advantage of, and founded the company in 2014. First called Vitalidi, due to trademark issues the company changed its name to CardioID, which makes

Their product Cardiwheel, made of conductive leather, is being tested on the vehicles of one of the biggest national transportation companies

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Agenda

ENDE 2016

The 21st International Workshop on Electromagnetic Nondestructive Evaluation (ENDE 2016), started on the last Sunday and is being held until the 28th, at the IST Congress Centre.

Since the 1st edition, in London, UK 20 years ago, that ENDE promotes worldwide the theoretical and applications research of electromagnetics non-destructive evaluation methods. ENDE is regarded as one of the most important academic meetings for researchers in this field, providing a forum for exchanging ideas and to discuss recent developments.

URL: <http://ende2016.lx.it.pt/>

IEEE RTTS 2016

IT in Porto, in collaboration with the research unit Cister, will host the 37th edition of the IEEE Real-Time Systems Symposium (RTTS). The event will take place from the 29th of November to 2nd of December 2016, in the premises of the Faculty of Engineering of the University of Porto and on the Polytechnic Institute of Porto.

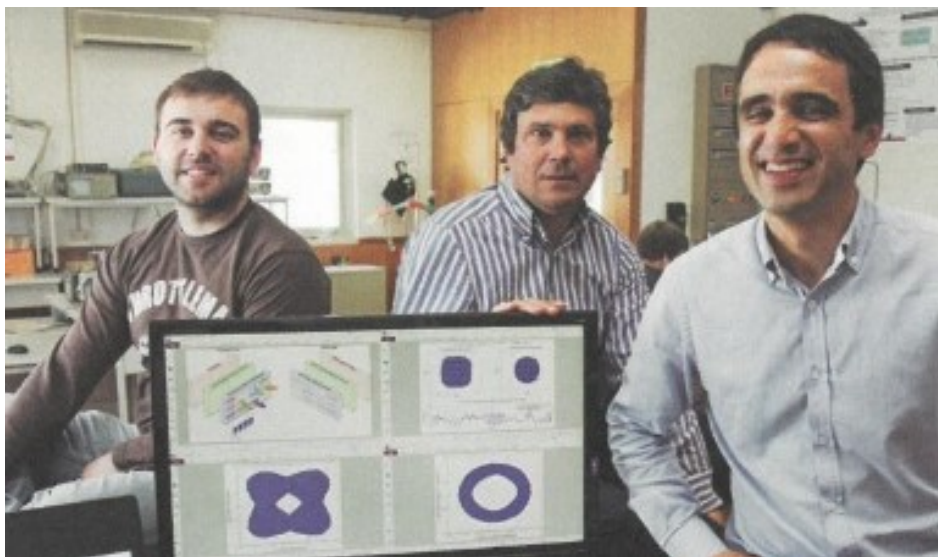
RTTS is the the flagship conference of the real-time systems community, presenting innovations in the field with respect to theory and practice. RTSS provides a forum for presenting high-quality, original research covering all aspects of real-time systems theory, design, analysis, implementation, evaluation, and experiences. RTSS 2016 continues the trend of making RTSS an expansive and inclusive symposium, looking to embrace new and emerging areas of real-time systems research.

URL: <http://2016.rtss.org/>

PROJECT SNAPSHOT — CardioID (continued from p. 2)

sense considering their technology uses “heart signals as a digital print”, said André Lourenço, like an ID. After some difficulties with getting funds, CardioID started to have greater visibility by participating in tech events and start-up accelerators, like FIWARE SOUL-FI, which helped them getting important funding to begin working full time in 2015. Initially focused solely on ECG-based biometrics, the company has broaden up its vision and now develops products that can also control factors like fatigue and cardiac abnormalities in an identified user. André Lourenço reveals that CardioID is now “particularly focused in the automobile sector”. Their product Cardiowheel, made of conductive leather, is being tested on the vehicles of one of the biggest national transportation companies. Other applications are also being developed, such as using the technology in bicycle handles, a project already approved for funding through the incentives system of the program Portugal 2020. With a national patent registered and an international approach (patents registered in the EU, USA, Canada, Brazil, South Korea and Japan), and having a pioneer technology, CardioID is on the right path to fulfil André Lourenço’s dream with becoming “one of the main worldwide providers in ECG biometrics”.

IT project promises a huge boost on communications energy efficiency



A team of researchers from IT has developed techniques that promise to improve mobile communications energy efficiency. According to Marco Gomes, from IT in Coimbra, “current mobile phones use very low efficiency linear amplifiers which means that a huge part of every watt spent on these mobile phone communications is wasted”. In order to improve the energy efficiency, the research team resorted to a ring-type magnitude modulation (RMM) method for narrowband offset quadrature phase shift keying (OQPSK) signals, that considerably reduces its envelope fluctuations without spreading the transmitted signal’s spectrum. “The goal is not to cut these values, but to smooth them. If we were to cut the maximum and minimum values, we would distort the signal and eventually lose information”, said Marco Gomes. Energy efficiency is particularly important to help overcome both reach and coverage limitations of 5th generation mobiles (5G), which will use Multiple Input Multiple Output (MIMO) technology. Since such technology implies using multiple antennas to send and capture signal segments, Marco Gomes underlines that “Each one of these antennas has a low efficiency linear amplifier. Can you imagine the waste we’ll have in each communication?”. Improving mobile communications energy efficiency is the first of three major goals of the IT project GLANCES, started in 2013. Its team, formed by Marco Gomes, Pedro Bento and Vitor Silva, all from IT in Coimbra, together with Paulo Montezuma and Rui Diniz from IT in Lisbon, are also working on two other goals: a) Extending the reach of mobile communications, and b) Allowing the use of the same frequency for different user beams which are in communication simultaneously.

Newsflash

Rui Aguiar on the top 5 editors of Wiley ETT

The Editor Chief of the Wiley Emerging Telecommunications Technologies (former European Transactions on Telecommunication) has selected Rui Aguiar, from IT in Aveiro, as one of the best executive editors of this prestigious journal. The IT researcher considers this to be “a recognition of the quality of the work performed for the scientific Community”.

Research team from IT wins AMDO 2016 Best Paper Award

Ozan Cetinaslan and Veronica Orvalho, both from IT in Porto, have won the Best Paper Award for their work “Localized Verlet Integration Framework for Facial Models”, in the 9th Conference on Articulated Motion and Deformable Objects - AMDO2016, held in Palma, Mallorca, Spain between 13-15 July.

Best Student Paper Award at the WINSYS 2016

Marco Sousa (ISEL), André Martins (Celfinet) and Pedro Vieira (IT), were distinguished with the Best Student Paper Award for their work “Self-Diagnosing Low Coverage and High Interference in 3G/4G Radio Access Networks Based on Automatic RF Measurement Extraction”, in the 13th International Conference on Wireless Networks and Mobile Systems, held in Lisbon from 26-28 July.

Best Poster Award at INForum 2016

Sidney Carvalho (Federal University of Santa Catarina/IT), Luis Almeida (IT) and Ubirajara Moreno (Federal University of Santa Catarina) were the winning authors of the Best Poster Award for their work “Distributed Connectivity Management in Networks of Multiple Robots in Area Coverage Tasks”, in the 8th INForum, held in Lisbon from 8-9 September.

Latest concluded PhDs hosted by IT

Sérgio Dias

Geometric Representation and Detection Methods of Cavities on Protein Surfaces

PhD in Computer Engineering, University of Beira Interior, May 2015, supervised by Abel Gomes. This thesis focuses on geometry-based methods to detect cavities on protein surfaces, as needed for computer aided molecular design and protein docking. This correspondence between critical points of a Gaussian surface that encloses a given protein and its cavities is the key point of this thesis. Moreover, Sérgio was one of the first molecular graphics researchers to leverage the processing power of GPUs in cavity detection methods.



Ricardo Martins

Placement, Routing and Parasitic Extraction Techniques applied to Analog IC Design Automation

PhD in Electronics and Computer Engineering, IST, July 2015, supervised by Nuno Horta. This dissertation addresses the automatic generation of analog integrated circuits (ICs) layout. A set of innovative placement, routing and parasitic extraction methodologies for analog IC design automation were implemented in the tool AIDA-L. This tool is integrated in the bottom-up physical synthesis path of an in-house analog IC design automation environment, AIDA (aidasoft.com). Ricardo is currently a Post-Doc researcher at IT.



Christopher Lima

Context-Aware Framework for Collaborative Work

PhD in Informatics Engineering, University of Aveiro, December 2015, supervised by Diogo Gomes and Rui Aguiar. The thesis targeted the potential use of context-aware and social information for collaborative applications to provide proactive behaviour in pervasive environments.

Christopher currently works with close collaboration with Altice Labs as a researcher for FP7 CoherentPaaS and H2020 Sharing Cities projects at IT in Aveiro.



Sylvain Marcelino

Depth Error Concealment Methods for 3D Video Over Error-prone Networks

PhD in Electronics and Computer Engineering, University of Trás-os-Montes e Alto Douro, January 2016, supervised by Pedro Assunção, Sérgio Faria and Silviano Soares. The thesis investigates error concealment methods for depth maps transmitted over error prone networks. Results show that quality improvement is consistent in synthesised views, beyond other state-of-the-art methods. Sylvain works as a Software Design and R&D Engineer at CWJ Power Electronics, Figueira da Foz, Portugal.



Where are you now?

Nelson Francisco

In November 2007 I joined IT in Leiria to work on an image and video compression research project. My work was supervised by Professors Sérgio Faria and Nuno Rodrigues, in a close collaboration with researchers from the Federal University of Rio de Janeiro (UFRJ). This collaboration allowed me to further pursue a joint PhD and contribute to some other research projects. The next years were spent working under the supervision of Professors Nuno Rodrigues (IT) and Eduardo Silva (UFRJ). After completing the PhD, in November 2012, I had the opportunity to spend some time with the Multimedia Telecommunication Group from the Poznan University of Technology, under the European Science and Technology cooperation project COST. This gave me the chance to work in the area of 3D video acquisition and compression with one of the leading labs in the area. In April 2013, I decided it was time for a career shift and I moved to the industry. I joined the R&D team at Ericsson Television, in the UK - one of the world's leading providers of video compression systems. As a Senior Research Engineer, all the knowledge and research methodology acquired while working at IT have been of extreme importance for my contributions to develop and improve cutting edge video compression products, designed to fulfil the demands of a competitive and fast growing market. Looking back, I feel extremely grateful for all the opportunities I had in IT. It was a great place to work, with a very pleasant and stimulating environment that provided me so many opportunities to learn, make connections and develop my professional skills. It was for me a real privilege to work with such a dedicated, enthusiastic and talented group of researchers and supervisors, having some really good time and making some great friends along the way. Thank you IT!

