

## Instituto de Telecomunicações turns 20



It was in April 12, 1992 that Universidade de Aveiro, Instituto Superior Técnico, Universidade de Coimbra and Correios e Telecomunicações de Portugal signed a notary deed to launch Instituto de Telecomunicações, with a 7.5 million Euro grant from JNICT. This was the on-set of a challenging journey to bring together existing telecommunications expertise that was scattered through different groups in Portugal and

build a solid institution aiming to become a reference in the field.

Looking back at its 20 years, it is appropriate to say that this vision materialized into a creative and dynamic research network in telecommunications with an outstanding team that today counts more than 200 researchers owning a PhD, 200 PhD students and 400 MSc students. With more than 250 papers published each year in peer reviewed journals, more than 11,000 accumulated journal paper citations registered in the ISI Citation Index, and with more than 60% self-funding, IT has definitely reached a high maturity level not only compared to national standards, but also in the international scenario. IT gained the statute of State Associate Laboratory in 2001 and was since joined by four more university and industrial partners.

A series of local events will be held in all sites and branches of IT to celebrate its 20th anniversary. The information on the events will be regularly updated in the webpage [www.it.pt/20years](http://www.it.pt/20years).

## Editorial

On the 20th anniversary of Instituto de Telecomunicações, it is gratifying to look back and see that over the years IT has grown not only in size but above all in terms of quality of its output as defined in the mission statement: creating and sharing scientific knowledge in telecommunications, and fostering higher education and training.



Actually the success of IT mirrors the success and decisive contributions from its researchers that teamed up over time in strong groups, building high international recognition. But this success was possible also because IT achieved critical mass in telecommunications to own the required advanced infrastructures. The institutional role of IT has been to provide conditions for researchers to develop freely their boldest ideas, with a minimum set of constraining rules. IT has survived rough times and moved fast forward in good times.

Coming years will put IT maturity to the test. I am confident that with this team, IT will keep on with its high standard.

**Carlos Salema**

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Send your news and contributions for  
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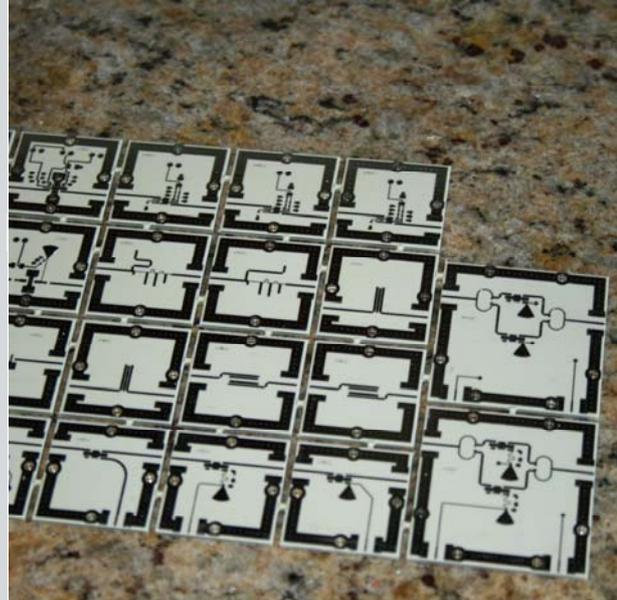
Edition: Vera Saldanha  
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Awareness of the existing gap between R&D results and its productive application has led the founding partners, João Matos and Ricardo Abreu from the Instituto de Comunicações in Aveiro, to create Built-In Lda.

## BUILT-IN — a spin-off from IT

Following their line of work over the past years, the main focus of the micro-company is the industrialization of DRSC technology (Dedicated Short Range Communications) that is used, for instance, in automatic road tolling. The industrialization process involves a partnership with a company from the road infrastructures area.

By building up experience on hardware design and development, with a special emphasis on wireless communications, Built-In exists to make its client's ideas become reality.



## PROJECT SNAPSHOT — LIFEisGAME

### Learning of facial emotions using serious games

The project attempts to show how it is possible to apply a pioneer serious game approach to teach people with Autism Spectrum Disorder (ASD) to recognize facial emotions. It is estimated that up to 10 000 Portuguese suffer from ASD and most still use non-interactive methods to learn facial emotions.

**LIFEisGAME advances the synthesis of realistic virtual characters and markerless motion capture technology, and creates a non-stressful game to help individuals recognize facial emotions in an interactive way.**

LIFEisGAME attempts to show how to teach people with ASD to express their emotions in an interactive manner, using real time synthesis and automatic facial expression analysis. LIFEisGAME overall objective is to deploy a low cost real time facial animation system embedded in an experimental game, which will allow to further study the symptomatic problems of facial emotion recognition.

This is a joint project between Portugal and UT Austin, led by Verónica Orvalho and developed by researchers from IT and FCT grantees, allied to Microsoft (Dr. Miguel Sales Dias), U Porto (Dra. Cristina Queirós), IPP (Dr. Antonio Marques) and UT Austin (Dr. Jake Aggarwal). It is a broader research effort, focusing on an open question of scientific and clinical importance, of whether the use of virtual characters in interactive training programs can provide a basis for ASD rehabilitation.

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## Agenda

### ◆ 27th IEEE Conference on Computational Complexity

The 27th IEEE Conference on Computational Complexity will be held on June 26th-29th at the Computer Science Department of the Faculdade de Ciências da Universidade do Porto (FCUP).

This event is organized by members of the Security and Quantum Information Group of Instituto de Telecomunicações (SQIG-IT) and it integrates the celebrations of the Alan Turing Year.

URL: <http://computationalcomplexity.org/>

### ◆ 2nd Lisbon Machine Learning School

The topic of the school is “Taming the Social Web”, covering a range of machine learning (ML) topics, from theory to practice, that are important in solving natural language processing (NLP) problems that arise in the analysis and use of web data. It is targeted for researchers, graduate students and industry practitioners.

LxMLS 2012 will take place on July 19-25th, at Instituto Superior Técnico. It is organized jointly by IST, Instituto de Telecomunicações, and Spoken Language Systems Lab - L2F from INESC-ID.

URL: <http://lxmils.it.pt>

### ◆ Summer School “Criptografia e Segurança da Informação”

The Security and Quantum Information Group of IT (SQIG-IT) and the Mathematics Department of IST (DM-IST) are organizing this Summer School for secondary school students, which will take place on July 18-20th at IST. It is limited to 30 participants. Registration is free and is open until April 30th.

URL: <http://www.escoladeverao.info/>

This real time facial animation system will have a relevant impact in the entertainment industry, academia and psychology. Our interactive digital media solution has an explicit and carefully thought-out educational purpose within the health care industry: games will help individuals to learn how to recognize emotions in a fun way and without inducing stress. New applications in graphics, animation, virtual reality and digital media are enabling the development of different learning-based strategies. Companies like Sony and Microsoft are investing vast resources in the research of new interactive methods for next-generation game consoles, including identification of facial expressions, which will expand the access and the impact of serious games.

With over 15 research publications in fields like facial animation, automatic visual speech, rigging, user interface, virtual characters, our team is preparing to release in May 2012 at UT Austin an early prototype of the technology of LIFEisGAME. In August 2011, the sketching technology behind the LIFEisGAME prototype got recognized with the best paper award at SBIM (Sketch Based Interfaces and Modeling). By the end of the project, June 2013, we expect to present further advances in the synthesis of realistic virtual characters and markerless motion capture technology and creates a non-stressful game that will help individuals with ASD to recognize facial emotions in an interactive and fun way.

Verónica Orvalho

<http://www.portointeractivecenter.org/lifeisgame/>

## New building for IT in the Aveiro site

Construction of a new building for IT with approximately 2000 m<sup>2</sup> has already started in the university campus of Aveiro, which will double the current area of the IT Site.

The number of researchers and running projects at IT in Aveiro has increased significantly in recent years, having topped in 2010 the occupation capacity of its facilities. Efforts started then between the management of Instituto de Telecomunicações in Aveiro and the University of Aveiro to make possible the construction of the new building. In the meantime, the Rectorate of the University offered temporary installation for IT growing number of researchers in Casa de Santa Joana, a fully restored palace in the centre of Aveiro.

The architectural project of the new building was produced by architect Joaquim Oliveira, from the Gabinete de Arquitectura of the University of Aveiro. With 480 m<sup>2</sup> of laboratory area, 300 m<sup>2</sup> distributed by four open-space rooms for grantees and additional twenty office rooms, the building will concentrate the research groups of Optical Communications and Radio Communications. Part of the building will be shared with another research institute.

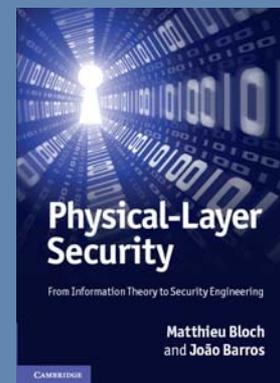
The 2,2 M€ building, co-funded by QREN, is expected to be completed by mid-2013.



## Books

### Physical Layer Security – From Information Theory to Security Engineering

By João Barros, Coordinator of the Porto Laboratory of IT, and Matthieu Bloch, from Georgia Institute of Technology. Publisher is Cambridge University Press. This complete guide to physical-layer security presents the theoretical foundations, practical implementation, challenges, and benefits of a groundbreaking new model for secure communication.



### Multimedia Communications and Networking

By Mário Marques da Silva, Researcher at IT, Professor at UAL (CESITI) and at Escola Naval Portuguesa (CINAV), publisher CRC –Taylor & Frances Group. Provides an insight into recent developments in multimedia, digital communications and network services and technologies. This book illustrates the means that will allow for improved digital communications and networks.

