5-6 December 2013
Lisbon, Portugal

BOOK OF ABSTRACTS

CETC2013
Conference on Electronics, Telecommunications and Computers

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Contents

About CETC2013

CETC 2013 is a premier conference in the broad field of Electronics, Telecommunications and Computers. The aim of the conference is to provide a platform for engineers to disseminate and discuss their current research findings and also to explore recent development, current practices and future trends in Electronics, Telecommunications and Computers.

We also encourage the dissemination of R&D linked to the Industry. The conference program includes sessions with invited speakers and breakout sessions with oral and poster presentations in the fields of Electronics, Telecommunications, and Computers.

CETC2013 is the second edition of the Conference on Electronics Telecommunications and Computers and it is organized by the Department of Electronics, Telecommunications and Computers Engineering of ISEL (Instituto Superior de Engenharia de Lisboa).

CETC2013 received 175 submissions. From these submissions, 43 oral and 75 poster presentations were made. The oral and poster sessions were attended by 156 registered participants, from 16 different countries.

Conference Topics

BIOMEDICAL APPLICATIONS

- Biomedical Electronics
- Computer Assisted Diagnosis
- Devices and Systems
- Image and Signal Processing
- Medical Imaging

COMMUNICATION, NETWORKING & BROADCASTING

- Antennas and Propagation
- Data Coding and Compression
- Information Theory
- Internet
- Microwave Circuits and Systems
- Physical Layer Transmission Technologies
- Security
- Signal Processing
- Standards
- Wireless Systems

COMPUTING & PROCESSING

- Cloud Computing
- Distributed Systems
- Embedded systems
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- Heterogeneous computing
- High Performance Computing
- Information Technology
- Networks
- Software

MULTIMEDIA SYSTEMS & APPLICATIONS

- Augmented Reality.
- Computer Assisted Diagnosis
- Computer Entertainment
- Human-Computer Interaction
- Image and Video Retrieval
- Media authoring and production
- Mobile Computing
- Ubiquitous Computing

ROBOTICS & CONTROL SYSTEMS

- Artificial Intelligence
- Computer Vision and Processing
- Data Acquisition and Control
- Human-Robot Interaction
- Navigation Systems
- Robotics Software
- Sensors & Actuators

SEMICONDUCTORS

- Circuit Design
- Devices
- Materials
- Microelectronics
- Nanotechnology
- Optoelectronic Devices and Integration
- Photonics

Final Proceedings

Following the peer review process, the manuscripts presented at the CETC2013 will be considered for publication in the Elsevier Journal PROCEDIA TECHNOLOGY (http://www.journals.elsevier.com/procedia-technology). Procedia Technology is an open access product focusing entirely on publishing conference proceedings, enabling fast dissemination, ensuring maximum visibility and the international reach of the papers presented at the conference. After publication the articles will be available through www.sciencedirect.com.

After the conference, authors of the selected papers will be invited to submit an extended version of their work to the Academic Journal i-ETC. Please note that publication on this Journal is subject to an additional peer review process.

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Invited Talks

Invited Talk 1
5th December, 9:30 - 10:30

Reliable quantification of uncertainty in the prediction of neurological disorders

Abstract
At the core of scientific enquiry is the advancement of our understanding of complex phenomena. The key elements for approaching such a problem are data and possibly some mathematical models encoding our understanding on the functioning of a system of interest. From a scientific perspective, it is imperative to combine data and models in a meaningful way so as to consistently quantifying the level of uncertainty in characterizing the model and in predictions. In this talk, I will focus on the probabilistic approach to the 'learning from data' problem. The probabilistic approach is arguably the most appealing framework for systematically and reliably quantifying uncertainty, but its application to scenarios involving the modeling of complex phenomena is computationally challenging. I will present recent trends in the literature where quantification of uncertainty has been made tractable, with a special emphasis on Markov chain Monte Carlo methods when it is difficult to specify a model for the system of interest. I will conclude the talk by presenting a successful application of such techniques to the early stage prediction of Parkinsonian diseases.

Maurizio Filippone
Lecturer with the School of Computing Science, University of Glasgow, United Kingdom
Personal webpage

Short Bio

Maurizio Filippone received a Master's degree in Physics and a Ph.D. in Computer Science from the University of Genova, Italy, in 2004 and 2008, respectively.In 2007, he was a Research Scholar with George Mason University, Fairfax, VA. From 2008 to 2011, he was a Research Associate with the University of Sheffield, U.K. (2008-2009), with the University of Glasgow, U.K. (2010), and with University College London, U.K (2011). He is currently a Lecturer with the University of Glasgow, U.K. His current research interests include statistical methods for pattern recognition. Dr Filippone serves as an Associate Editor for Pattern Recognition and the IEEE Transactions on Neural Networks and Learning Systems.

Chairperson: João Ferreira
Instituto Superior de Engenharia de Lisboa, Portugal

Invited Talk 2
5th December, 14:10 - 15:10

The 4G introduction into the Optimus network

Abstract
The LTE/LTE-Advanced technology enables a true convergence between the fixed and mobile networks, yielding the "always connected in the best device" experience. In this talk, I will address the Optimus mobile operator experience, regarding the network several stages of development, namely the study and simulation, the spectrum acquisition, and finally the deployment and optimization. I will focus on a brief introduction regarding the OPTIMUS operator, the actual trends and recent evolution of technology for mobile communications, the LTE technology in a worldwide perspective, the stages of LTE introduction by OPTIMUS, and the LTE-Advanced challenges and applications.

Luis Mata
ZonOptimus Communications SA, Portugal

Short Bio
Luís Mata graduated from Instituto Superior Técnico, Technical University of Lisbon, Portugal in 1996, in Electrical and Computer Engineering. In 2008, he got his MBA from AESE/IESE – Escola de Direcção e Negócios, Lisbon, Portugal. He has been with OPTIMUS, Telecomunicações S.A, since 1998 until the present date, working in mobile communications. His professional experience includes being a team leader in planning and optimization of radio resources as well as group manager for planning and optimization. Recently, he has been involved in the launch of the LTE 4G in the OPTIMUS network. Currently, he coordinates the mobile access team which is responsible for managing performance, and network capacity in the 2G, 3G, and 4G technologies.

Chairperson: Paulo Marques
Instituto Superior de Engenharia de Lisboa, Portugal

Invited Talk 3
5th December, 15:10 - 16:10

Path to and from NGPON2

Abstract
Access networks are currently a hot topic since they represent the last mile of the optical networks, however they represent the first mile from and to the end user. This fact leads the market watch to this segment, therefore several efforts are made to provide the best low cost high performance solution. The introduction of GPON and EPON made this market viable and attractive, and increased pressure in the market. In this paper we will present a revision on the current standardization efforts and current technologies. The main issues and trends will be addressed also focusing in the potential paths to come in NGPON2 and following.

Mário Lima
University of Aveiro, Portugal

Short Bio
Mário J. N. Lima is currently an Assistant Professor at the Department of Electronics, Telecommunications and Informatics of the University of Aveiro and Researcher at the Institute of Telecommunications – Aveiro, in the optical communications group, where he participated in several national (FCT and QREN support) and international projects included in the European Union (EU) Telecommunications R&D Programs: ACTS and IST. He has also collaborated in reviewing process of IST-FP7 projects (HECTO).

He received the Licenciatura degree in Electronics Engineering and Telecommunications, in July of 1994, the M.Sc. degree in Telecommunications Systems, in June of 1998, and the Ph.D. degree in Electrical Engineering, in July

of 2003, all from the University of Aveiro, Portugal. His research interests include architectures/technologies for Next-Generation Passive Optical Networks, RF over fiber technologies, advanced modulation formats, optical filtering and add/drop multiplexing in DWDM optical networks, dispersion compensation and monitoring, fiber Bragg gratings for sensor and telecommunications applications and all-optical processing. He is member of the Portuguese Engineering Association (OE), of The Institute of Electrical and Electronics Engineers (IEEE) and of the Optical Society of America (OSA).

Chairperson: Paulo Marques
Instituto Superior de Engenharia de Lisboa, Portugal

Invited Talk 4
6th December, 9:30 - 10:30

Reverse engineering the brain with humanoid robots

Abstract
In this talk, I will give an overview of recent research projects in my lab at IST-Lisbon. I will describe recent results in the context of using humanoid robotics for reverse engineering the brain, namely by modelling the human behaviour in an interdisciplinary research involving computational neuroscience, developmental psychology and engineering. One aspect is related to neuro-physiology and the discovery of the mirror neurons which suggest that both action understanding and execution are performed by the same (motor) areas of the brain, possibly the root for non-verbal communication and facilitating social learning amongst con-specific individuals. I will present a computational model inspired by these findings and that outperforms (classic) approaches in gesture recognition from video. A second aspect corresponds to the developmental pathway that allows by human infants (or robots) to successively acquire news skills based on previously learned capabilities while managing the complexity of the body-senses-environment. The talk will focus on aspects of sensorimotor coordination, learning about affordances and social interaction. During the talk, I will provide examples of the use of humanoid robots (with our first platform, Baltazar, and the iCub) as testbeds to study human cognition, learning and sensorimotor coordination, while offering engineers with new approaches to build artificial systems.

José Santos-Victor
Full Professor, Instituto Superior Técnico (IST)
ISR/IST Vice-Director, Computer and Robot Vision Laboratory (VisLab), Portugal
Personal webpage

Short Bio

José Santos-Victor received the PhD degree in Electrical and Computer Engineering in 1995 from Instituto Superior Técnico (IST - Lisbon, Portugal), in the area of Computer Vision and Robotics. He did the Habilitation in 2005 and became a Full Professor at the Department of Electrical and Computer Engineering of IST in 2010. He is a researcher of the Institute of Systems and Robotics (ISR) and he founded and heads the Computer and Robot Vision Lab - VisLab.

He is the scientific responsible for the participation of IST/ISR in various European and National research projects in the areas of Computer Vision and Robotics. His research interests are in the areas of Computer and Robot Vision, particularly in the relationship between visual perception and the control of action, biologically inspired vision and robotics, cognitive vision and visual controlled (land, air and underwater) mobile robots.

Prof. Santos-Victor was an Associated Editor of the IEEE Transactions on Robotics and the Journal of Robotics and Autonomous Systems. He is the Vice-President of IST for International Affairs since 2006. He has been the Secretary General of the CLUSTER network from July 2010 to June 2012.

Chairperson: Arnaldo Abrantes
Instituto Superior de Engenharia de Lisboa, Portugal

Invited Talk 5
6th December, 14:10 - 15:10

Recent advances in silicon photonics

Abstract
Silicon-based photonics has generated an increasing interest in recent years, mainly for optical telecommunications and optical interconnects in microelectronic circuits. The rationale of silicon photonics is the reduction of photonic system cost and the increase of the number of functionalities on the same integrated chip by combining photonic and electronic together. Numerous developments on passive and active building blocks have been made including waveguides, modulators, lasers and photodetectors on silicon platform. An overview of all optoelectronic building blocks available today for the development of high speed optical links will be presented and the main challenges highlighted. Finally, the different electronic/photonic integration schemes will be reported and discussed.

Laurent Vivien
CNRS Researcher
Institut d'Electronique Fondamentale – Silicon Photonics Group University of Paris Sud, France
Personal webpage

Short Bio

Dr Laurent VIVIEN is presently CNRS researcher in charge of the silicon photonics group at the Institute of Fundamental Electronics (IEF) located at the University of Paris Sud. He is working on passive and active photonic devices in group IV materials including photonic crystals, silicon modulator, germanium

photodetector, Ge/SiGe quantum and carbon nanotube optoelectronic devices. He is involved in several national and European projects (FP6-STREP-SABIO, FP6-REX-ePIXnet, FP7-FET-UNITRIDE, FP7-IP-HELIOS, FP7-IP-Plat4m and FP7-Celtic+-SASER) and international collaborations with Japan, Canada and China. He has published more than 100 papers in international journals and more than 100 papers in international conferences. He also contributed to several books on silicon photonics and he is holder of 6 patents.

Chairperson: Reinhard Schwarz
Instituto Superior Técnico, Portugal

Invited Talk 6
6th December, 15:10 - 16:10

Laser-induced crystallization of Si films for displays, solar cells, and microelectronics

Abstract

Laser-induced crystallization of as-deposited amorphous Si films is an unconventional way to generate device-optimized Si films for various large-area-electronic and microelectronic applications. In this presentation, a historical overview of the field, as well as its current status as regards fundamental understanding and technological progress, will be provided. In addition to the excimer-laser-based methods that are presently being employed to manufacture advanced LCDs and AMOLED displays (and which may also be well-suited for certain microelectronic applications, such as 3-dimensional integrated circuits), we will also go over a cw-laser-based crystallization technique, which is referred to as mixed-phase solidification (MPS). This particular melt-mediated crystallization method may eventually permit a seed-layer-based fabrication route for manufacturing crystalline-Si-film-based high-efficiency solar cells on low-cost large-area substrates. Additionally, we will comment on how some of these laser-crystallization approaches, particularly in the form of sequential-lateral solidification (SLS), can be utilized to manipulate and optimize the microstructure of metallic and oxide thin films for electronic applications.

James S. Im
Professor and Chair of Program in Materials Science and Engineering
Department of Applied Physics and Applied Mathematics,
Columbia University, NY, USA
Personal webpage

Short Bio

Dr James S. Im holds a B.S. (with distinction) in Materials Science and Engineering, from the Cornell University, 1984 and a Ph.D. in Electronic Materials, from the Massachussets Institute of Technology, 1989. He was with the California Institute of Technology (1989-1991), as a post-doctoral research fellow, in the Department of Applied Physics. In the 1998-1989 period, he was a Research Consultant, in the Electronic Materials Group, of Massachussets Lincoln Laboratory. He is with the Columbia University, since 1991, being Assistant Professor (1991-1994), Associate Professor(1995-2002). Since 2003, he holds the position of full Professor and Chair of Program in Materials Science and Engineering, Department of Applied Physics and Applied Mathematics, in the Columbia University. Dr Im has 86 journal and conference publications, approximately 90 pending patents and 64 awarded patents.

Chairperson: Reinhard Schwarz
Instituto Superior Técnico, Portugal

Oral Sessions

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Chairperson: António Rodrigues
Instituto Superior Técnico, Portugal

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Instituto Superior de Engenharia de Lisboa, Portugal

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Instituto Superior de Engenharia de Lisboa, Portugal

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Instituto Superior de Engenharia de Lisboa, Portugal

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Instituto Superior Técnico, Portugal

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Chairperson: Carlos Silva Cardenas
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Instituto Superior de Engenharia de Lisboa, Portugal

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Instituto Superior de Engenharia de Lisboa, Portugal

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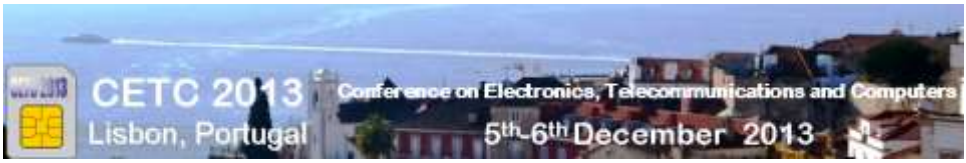

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