ConfTele 2019

11th CONFERENCE ON TELECOMMUNICATIONS

June 26th, 27th and 28th, 2019

Sede da Ordem dos Engenheiros, Lisboa

PORTUGAL

Programme

Sailing the Oceans of Telecommunications

ORDEM DOS ENGENHEIROS

instituto de telecomunicações

Sponsor: ROHDE&SCHWARZ

Programme

Time	Wednesday, June 26th	Thursday, June 27th		Friday, June 28th	
9:00		AUDITORIUM		AUDITORIUM	SANDE E LEMOS
		9:45 Welcome Session Bastonário da Ordem dos Engenheiros, Eng. Carlos Mineiro Aires Prof. Carlos Salema Engª. Isabel Oliveira Prof. Francisco Cercas		Optical Communication Systems and Signal Processing	Cloud Computing and Networking
10:00-10:40	*Welcome* _____ Workshop on Communications, Public Safety and Innovative Applications with Aerial Drones	Keynote Speaker Riku Jäntti Aalto University School of Electrical Engineering, Finland			
10:40-11:00		Coffee-break		Coffee-break	
11:00-11:40		Keynote Speaker Dipankar Raychaudhuri WINLAB (Wireless Information Network Lab), Rutgers University		AUDITORIUM Interactive Sessions (*posters*)	
11:40-12:40		Questions & Answers		Panel on 5G Moderator - Américo Correia Francisco Fontes, Altice Labs Luís Miguel Santo, NOS Marco Serrazina, Vodafone João Miguel Coelho, ANACOM	
12:40-14:00	Lunch	Lunch		Lunch	
14:00-15:40	Workshop on Communications, Public Safety and Innovative Applications with Aerial Drones (CONQUEST CMU/ECE/0030/2017)	AUDITORIUM Mobile and Wireless Communications I	SANDE E LEMOS Sensors, IoT and Applications	AUDITORIUM Antennas, Microwaves and Radiowave Propagation	SANDE E LEMOS Artificial Intelligence and Machine Learning
15:40-16:00		Coffee-break		Coffee-break	
16:00-17:40		Mobile and Wireless Communications II	Multimedia Computing, Technologies and Applications / Signal Processing	Vehicular Communications and Drones	Multimedia Computing, Technologies and Applications / Materials and Devices
19:45		Conference Dinner		17:45 Closing Session Francisco Cercas Fernando Velez	

Keynote Speakers

Riku Jäntti, Department of Communications and Networking, Aalto University, School of Engineering, Finland.

Ambient and Quantum Backscatter Communications

Abstract: Low-power wireless communication has been identified as one of the key enabling technologies for the Internet of Things (IoT). The performance of the contemporary IoT connectivity solutions is mainly limited by congestion, interference, and limited operation time with the battery. These limitations hamper the scaling of the IoT deployments. In this talk, we envision a new solution to the IoT connectivity combining existing and emerging wireless communication systems (hereafter legacy systems) with a new layer of ultra-low-power or passive ambient backscatter communication (AmBC). It can operate under very low signal-to-noise ratio conditions, share the spectrum with legacy systems without causing harmful interference to them, and scale to support a large number of devices. We will also discuss how the emerging microwave quantum technology can be utilized to enhance the performance of backscatter communications beyond the limits of classical solutions.

Riku Jäntti is a Full Professor of Communications Engineering and the head of the Department of Communications and Networking at Aalto University School of Electrical Engineering, Finland. He received his M.Sc (with distinction) in Electrical Engineering in 1997 and D.Sc (with distinction) in Automation and Systems Technology in 2001, both from Helsinki University of Technology (TKK). Prior to joining Aalto (formerly known as TKK) in August 2006, he was professor pro tem at the Department of Computer Science, University of Vaasa. Prof. Jäntti is a senior member of IEEE and associate editor of IEEE Transactions on Vehicular Technology. He is also IEEE VTS Distinguished Lecturer (Class 2016). The research interests of Prof. Jäntti include radio resource control and optimization for machine type communications, Cloud-based Radio Access Networks, spectrum and co-existence management, and quantum communications.

Dipankar Raychaudhuri, Director, WINLAB | Distinguished Professor, ECE, Rutgers University

COSMOS: An Open Programmable City-Scale Research Testbed for 5G and Beyond

Abstract: This talk presents an overview of the new COSMOS testbed being developed jointly by Rutgers, Columbia and NYU under the National Science Foundation's recently announced Platforms for Advanced Wireless (PAWR) program. The COSMOS testbed has a particular focus on "beyond 5G" ultra-high bandwidth and low latency communication tightly integrated with edge computing, and is thus intended to provide a suitable platform for real-world evaluation of future edge-cloud enhanced mobile networks and services. Motivating applications such as augmented reality, cloud-assisted vehicular and smart intersection are identified in terms of typical functionality and bandwidth/latency requirements. The COSMOS open, programmable testbed architecture based on software-defined radios (SDR), cloud radio access networks (CRAN), software defined x-haul networks (SDN) and mobile edge cloud (MEC) is given. Key technologies in COSMOS including SDR base stations, mmWave radio, optical wavelength division switching, next-generation mobile core network and distributed edge cloud will be discussed. Plans for COSMOS deployment in uptown Manhattan along with a future roadmap for the project are given in conclusion.

Dipankar Raychaudhuri is Distinguished Professor, Electrical & Computer Engineering and Director, WINLAB (Wireless Information Network Lab) at Rutgers University. As WINLAB's Director, he is responsible for an internationally recognized industry-university research center specializing in wireless technology. He is also Principal Investigator for several large U.S. National Science Foundation funded projects including the "ORBIT" wireless testbed, the "MobilityFirst" future Internet architecture and the "COSMOS" Platforms for Advanced Wireless Research (PAWR) program.

Dr. Raychaudhuri has previously held corporate R&D positions including: Chief Scientist, Iospan Wireless (2000-01), Assistant General Manager & Department Head, NEC Laboratories (1993-99) and Head, Broadband Communications, Sarnoff Corp (1990-92). He obtained the B.Tech (Hons) from IIT Kharagpur in 1976 and the M.S. and PhD degrees from SUNY, Stony Brook in 1978, 79. He is a Fellow of the IEEE and the recipient of several professional awards including the Rutgers School of Engineering Faculty of the Year Award (2017), IEEE Donald J.

Fink Award (2014), Indian Institute of Technology, Kharagpur, Distinguished Alumni Award (2012), and the Schwarzkopf Prize for Technological Innovation (2008).

Regular Sessions

MOBILE AND WIRELESS COMMUNICATIONS I

***Chair*:** Marco Gomes

Performance Evaluation of Forecasting Models for Mobile Communication Networks Traffic Prediction
Diogo Clemente, Lúcio Ferreira, Pedro Sebastião, Gabriela Soares, Daniel Fernandes and Rodrigo Cortesão

Implementation of MIMO Systems in USRPs
Rooderson M. Andrade, Fernando José da Silva Velez, Kun Chen and Ana Garcia Armada

Time Overlapping TIBWB-OFDM Symbols for Peak-To-Average Power Ratio Reduction
Filipe Conceição, Marco Gomes, Vítor Silva and Rui Dinis

Scrambling Code Planning for UMTS Cellular Networks
Rodrigo Cortesão, Lúcio Ferreira, Pedro Sebastião, Daniel Fernandes, Diogo Clemente and Gabriela Soares

A Study on System Capacity for HeNBs with Different Schedulers
Rui R. Paulo and Fernando J. Velez

SENSORS, IOT AND APPLICATIONS

Chair: Luís Bernardo

Array-based Approach for Indoor Positioning System using RFID Passive Tags
Simão Faria, João Pereia, Silvio Mendes, Hugo Gomes and Carlos Neves

The Extraordinary Optical Transmission Effect in Metallic Nanoantennas
Ricardo Lameirinhas and João Torres

Wireless Sensor Network for Indoor Air Quality Monitoring
Mariana Jacob Rodrigues, Octavian Postolache and Francisco Cercas

Mobile Hand Gesture Recognition System for the Portuguese Sign Language
Sara Ferreira, Nuno Souto and Octavian Postolache

Wireless Smartphone-based Monitoring of Multiple Pulse-Oximetry Sensors
Márcio Fernandes Calil, Ihor Koval, Luís Marcelino, Luís Conde Bento and Sérgio Faria

MOBILE AND WIRELESS COMMUNICATIONS II

***Chair*:** Francisco Cercas

On the Design and Optimisation of an RF Frontend for a Multi-RAT Optical Access Testbed
Bruno Brandão, Abel Lorences-Riesgo, Fernando Guiomar and Paulo Monteiro

Optimization of Low-Cost Analog Optical Transceivers for a C-RAN Outdoor Testbed
Marco Fernandes, Abel Lorences-Riesgo, Fernando Guiomar and Paulo Monteiro

5G Testbed for OTA Testing at 60 GHz: From GbE-based to UHD Multi-stream Video
Rodolfo Gomes, Luis Duarte, Carlos Ribeiro, Akram Hammoudeh, Manuel Sánchez and Rafael Caldeirinha

Techno-Economic Trade-off of Small Cell 5G Networks
Emanuel Teixeira, Anderson Ramos, Marisa Lourenço, Fernando J. Velez and Jon M. Peha

MULTIMEDIA COMPUTING, TECHNOLOGIES AND APPLICATIONS / SIGNAL PROCESSING

***Chair*:** Paula Queluz

Low Power Compressive Sensing for Hyperspectral Imagery
José Nascimento and Mário Véstias

Dermatological Imaging using a Focused Plenoptic Camera: the SKINL2 Light Field Dataset

Sérgio Faria, Miguel Santos, Pedro Assunção, Luís Távora, Lucas Thomaz, Pedro Pereira, Rui Pinto, Felicidade Santiago, Victoria Dominguez and Martinha Henrique

Development of an API for a Human-Eye Scan Ultrasound System
Carlos Pinto, Paulo Fernandes, Miguel Caixinha, Sandrina Nunes, Miguel Morgado, Mário Santos, Jaime Santos, Lorena Petrella, Marco Gomes and Fernando Perdigão

Analysis of Electrocardiographic Patterns for Epileptic Seizure Prediction
Francisco Sargo, Ana Fred, Hugo Silva and Carla Bentes

OPTICAL COMMUNICATION SYSTEMS AND SIGNAL PROCESSING

Chair: João Rebola

Characterization and Modeling of Link Loss for an Outdoor Free-Space Optics Transmission System
Daniel Albergaria, Federico Rocco, Andrea Carena, Fernando Guiomar, Abel Lorences-Riesgo and Paulo Monteiro

On the Scalability of Cost-Effective Metropolitan Network Architectures for the 5G-Era Using Flexible Coherent Interfaces
Nelson Costa, António Eira, Antonio Napoli and João Pedro

Analysis of the Coupling between a Single-Mode Fiber to a Multi-Core Fiber with Long-Period Gratings
Liliana Sousa, Gil M. Fernandes, Margarida Facão, Rogério N. Nogueira and Ana M. Rocha

Transmission Range of High-Capacity 100-QAM with Probabilistic Constellation Shaping
Beatriz M. Oliveira, Abel Lorences-Riesgo, Fernando P. Guiomar, Maria C. R. Medeiros and Paulo P. Monteiro

CLOUD COMPUTING AND NETWORKING

Chair: Paulo Nunes

A SDN-Based Solution Towards Smooth Adaptive Playback for Dynamic Video Streaming over HTTP
Mickaël Cunha, José Moura and Paulo Nunes

Inter-site Network Service Orchestration over SDN-Enabled Transport Networks
Jorge Oliveira, Diogo Gomes and Rui Aguiar

Implementing a Software-Defined Radio Access Network for an Open 5G Testbed
Akeem Olapade Mufutau, Carlos Borges Lopes, Abel Lorences-Riesgo, Fernando P. Guiomar, Atilo Gameiro and Paulo P. Monteiro

Implementing Network Level High-Availability and Load-Balancing on OpenStack, using SDN and NFV
Filipe Ramalho Fernandes and Fernando Mira da Silva

ANTENNAS, MICROWAVES AND RADIOWAVE PROPAGATION

***Chair*:** Custódio Peixeiro

Novel Electronically Reconfigurable Transmitarray for 2D Beamsteering: Emerging Applications
João R. Reis, Mário Vala and Rafael F.S. Caldeirinha

Radio Channel Sounder for 5G Propagation Modelling at 28 GHz - Initial Trials on the Factory of the Future Use Case
Rafael Caldeirinha, Nuno Leonor, André Sardo, Carlos Ribeiro and Gláucio Ramos

A Building Information Modelling Plug-in for Future Building Electromagnetic Certification
Rafael Caldeirinha, Telmo Fernandes, Iñigo Cuiñas and Hugo Rodrigues

New Shielding Technique based on Carbon Powder for CLT Building Materials
Wilson Conniott, Judite Vieira, Silvia Monteiro and Rafael Caldeirinha

Metamaterial Wormhole Superabsorber
Stanislav Maslovski, Iurii Medvedev, Hugo Ferreira, Henrique Silva, Abdelghafour Abraray and Telmo Fernandes

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Chair: Fernando Guiomar

Soft Biometrics Analysis: Gender Estimation in Crowded Urban Environments
Ehsan Yaghoubi, Pendar Alirezazadeh, Eduardo Assuncao, Wiam Zamrani, João Neves and Hugo Proença

A New Approach Towards Waste Container Detection in Smart Cities
Miguel Valente, João Caldeira, Vasco Soares, Hélio Silva and Pedro Gaspar

Recognizing Pedestrian Clothing in Crowded Urban Environments Using Convolutional Neural Networks
Pendar Alirezazadeh, Ehsan Yaghoubi, Eduardo Assunção, João C. Neves and Hugo Proença

An Enhanced Power Consumption Prediction for LTE Remote Radio Unit based on Mixed Models
Thaina Saraiva, David Duarte, Iola Pinto and Pedro Vieira

Towards AGV Optimization using ROS and Stage Simulator
Bruno Carneiro da Silva and Luís A. Alexandre

VEHICULAR COMMUNICATIONS AND DRONES

Chair: Lucas Thomaz

Development of a System for Aerial Tracking
João Morais, José Sanguino and Pedro Sebastião

GPS Data Alteration for Use in a Position Spoofing System
João Ponte, Francisco Cercas, Pedro Sebastião, José Sanguino and Rui Dias

Assessing Spoofing of GPS Systems
Rui Dias, Francisco Cercas, José Sanguino and João Ponte

MULTIMEDIA COMPUTING, TECHNOLOGIES AND APPLICATIONS / MATERIALS AND DEVICES

Chair: João Carreira and Ivo Sousa

Lossless Video Compression Using Minimum Rate Predictors and Volumetric Optimisation
Luís Lucas, Nuno Rodrigues, Luis Cruz and Sérgio Faria

Omnidirectional Video Coding: new coding tools and performance evaluation of VVC
José N. Filipe, João Carreira, Luis M. N. Távora, Sérgio M. M. Faria, António Navarro and Pedro A. A. Assunção

Socioeconomic Study of the Use of Solar Photovoltaic Technology to Optimize the Use of Electricity in a Company
Beatriz Durão and João Torres

Economic Sustainability Study of São Miguel Island in Azores Using Photovoltaic Panels and Wind Turbines
Inês Melo and João Torres

INTERACTIVE SESSION

Chairs: Ana Aguiar & Fernando J. Velez

Anomaly Detection in Moving-Camera Video Sequences Using Principal Subspace Analysis
Lucas Thomaz, Eric Jardim, Allan Freitas da Silva, Eduardo Antonio Barros da Silva, Sergio Lima Netto and Hamid Krim

Lossless compression of Light Fields using multi-reference Minimum Rate Predictors
João Santos, Pedro Assunção, Luís Cruz, Luís Távora, Rui Pinto and Sérgio Faria

Error Concealment-Aware Encoding for Robust Video Transmission
João Carreira, Pedro A. Amado Assunção, Sérgio Faria, Erhan Ekmekcioglu and Ahmet Kondoz

Defect Classification With SVM and Wideband Excitation in Multilayer Aluminum Plates
Dario Jerónimo Loureiro Pasadas, Helena Geirinhas Ramos, Bo Feng, Prashanth Baskaran and Artur Lopes Ribeiro

Light Field Image Coding Using High-Order Intrablock Prediction