SoftCOM 2019 - CONTENTS

GENERAL CO-CHAIRS MESSAGE

Dear participants and colleagues, it is our pleasure to welcome you to SoftCOM 2019 conference. We are excited to have an opportunity to take part in the organization of an international conference that gathers researchers and professionals from academia and industry to share experiences and new ideas in such a dynamic area as Information and Communication Technology (ICT).

Our industry is changing faster than ever, and we live in the world of 5G Mobile Networks, Artificial Inteligance, Machine Learning... Through joint research and technology advancement we are opening ground for new discoveries. We are enabling people to collaborate, innovate, learn in ways we never thought possible. We are connecting cars, robots, shipping containers, agricultural fields, traffic systems. A collaboration of industry with scientific and academic community is a key success factor in today's highly competitive global marketplace. We can together deliver growth and prosperity, having the potential to leave a positive legacy for generations to come.

The 27th International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2019), co-sponsored by the IEEE Communications Society, will be held in the beautiful city of Split on the magnificent Croatian Adriatic coast. It will be our pleasure to meet you at the conference.

Welcome!

Dr. Sinisa Krajnovic, Ericsson

Prof. Dinko Begusic, University of Split - FESB

TEHNICAL PROGRAM CHAIRS MESSAGE

The 27th Conference on Software, Telecommunications and Computer Networks (SoftCOM 2019) will be held in attractive ambience of the Radisson Blu Resort Split hotel, Split, Croatia, September 19 to 21.

Researchers and experts from industry, research institutes and universities from 30 countries all around the world have submitted their submissions for presentation at SoftCOM 2019. Submitted papers have been reviewed by more than 250 scientists from universities, institutes and ICT companies. 107 accepted papers have been carefully selected based on their contribution, relevance, conceptual clearness and overall quality. Thus 48% of submitted papers have been recommended for presentation within the technical program.

The technical conference program features nine general conference sessions, three symposia, and five special sessions. The symposia have been dedicated to the following topics: Security and Digital Forensics, Green Networking and Computing, and Environmental Electromagnetic Compatibility. The special sessions are dedicated to hot topics including: Smart Environments and IoT Technologies, Ad Hoc and Sensor Networks, QoS in Wired and Wireless Networks, Robotic and ICT Assisted Wellbeing, and Advanced Educational Technologies.

Besides that a Business Forum will be organized featuring invited talks, industrial presentations, workshops and round tables with participation of managers, experts, and institutions' representatives. The 8th Workshop on Software Engineering in Practice has been organized by the research group from Ericsson Nikola Tesla company. The PhD Forum and the SoftCOM Innovations Challenge provided the opportunity to young researchers to promote their research and improve their innovations management skills.

On behalf of the Program committee we would like to thank and credit the authors for their excellent contributions. Particular thanks to the reviewers for their great job as well as to the IEEE Communications Society (ComSoc), Technical Committee of Communication Software for the support.

Program Committee Co-chairs

Nikola Rozic, Pascal Lorenz

SoftCOM 2019 COMMITTEES

TECHNICAL PROGRAM COMMITTEE

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Pascal Lorenz, University of Haute Alsace, France (co-chair)

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Matko Saric, University of Split, Croatia
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SoftCOM 2019 Conference Secretary
Katarina Radoš, University of Split, softcom@fesb.hr

UNIVERSITY OF SPLIT

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COMMUNICATIONS AND INFORMATION SOCIETY, CROATIA (CCIS)

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Technically co-sponsored by:

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IEEE COMMUNICATIONS SOCIETY – CROATIA CHAPTER

http://www.fesb.hr/SoftCOM

SoftCOM 2019 PROGRAM OUTLINE

Thursday, September 19, 2019

*(location: **Hotel Radisson Blu**)*

08.00 – 16.00 Registration

09.00 - 10.30 Technical program, Professional program, Business forum

10.30 - 11.00 Coffee break

11.00 - 12.30 Technical program, Professional program, Business forum

Lunch time

14.30 - 16.00 Technical program, Professional program, Business forum

16.00 - 16.30 Coffee break

Friday, September 20, 2019

*(location: **Hotel Radisson Blu**)*

08.00 - 11.00 Registration

09.00 - 10.30 Technical program, Professional program, Business forum

10.30 - 11.00 Coffee break

11.00 - 12:30 Opening ceremony, Keynote speech

Conference Luncheon

14.30 - 17.00 Registration

14.30 - 16.00 Technical program, Professional program, Poster Session, Business forum

16.00 - 16.30 Coffee break

16.30 - 18.00 Technical program, Professional program, Business forum

18.15 Bus transfer to Port of Split

18.30 – 19.30 Guided Tour in Split

19.30 – 21.00 Welcome Party in Split

Saturday, September 21, 2019

*(location: **Hotel Radisson Blu**)*

08.00 - 10.30 Registration

08.30 – 10.00 Technical program, Professional program, Business forum

10.00 - 10.30 Coffee break

10.30 - 12.00 Technical program, Professional program, Business forum

Lunch

13.30 – 17.30 Conference Trip

KEYNOTE / INVITED SPEAKERS

KEYNOTE SPEECH Friday, September 20

11:00-12:30 (GRAND BALLROOM)

Szabolcs Malomsoky, PhD

Head of Ericsson Research Budapest, Hungary

Evolving 5G for the next decade

5G networks are emerging all across the globe. Mobile broadband services are being significantly improved enabling even richer experiences compared to today's smartphone apps. Moreover, new applications of mobile networks are being invented related to e.g. the manufacturing and automotive industries. These require a networking and compute infrastructure which can provide ultra-low latency and high reliability. 5G and its future evolution is a digital infrastructure for industrial and societal transformation. In this talk I highlight new enabling technologies including research results from the Research Lab I'm heading.

Szabolcs Malomsoky

Szabolcs Malomsoky is the head of the Research Sector called Network Implementation and Transport (Budapest, Stockholm and Santa Clara) as well as the Budapest branch of Ericsson Research. He received a PhD degree from the Budapest University of Technology and Economics in 2003. Szabolcs worked with strategy setting and technical leadership in research areas including analytics, cloud computing, network management and programmable networks. The research branch under his lead works on key projects of Ericsson Research around cloud technologies, network evolution and artificial intelligence. Since the beginning of 2016 he is also responsible for the Ericsson Garage in Budapest, which is an incubator of new innovations, developing minimum viable products for diverse customers. Szabolcs holds over 30 international patents (granted and in progress), over 15 international conference and journal papers. He was a presenter at the Mobile World Congress, Technical Sessions in Cannes, 2001.

INVITED SPEAKER IS1 Thursday, September 19

14:00-14:30 (OLEANDAR)

Darko Zibar, PhD

Technical University of Denmark, Denmark

Machine Learning Techniques for Next-generation Optical Communication Systems

Recently, there has been an increasing amount of research focused on the application of machine learning techniques to optical communication and photonics. These applications have varied from component characterization, ultra-sensitive optical phase detection, performance prediction and system optimization, and more recently, within the field of quantum communication and optical fibre sensing. In this talk, a brief overview of the application of machine learning in optical communication will be given. Then, techniques from Bayesian machine learning and digital coherent detection will be presented on how to perform ultra-sensitive, and optimum in a statistical sense, detection of optical amplitude and phase, which later can be used to perform relative intensity and frequency laser noise characterization. Finally, a novel concept on information transmission over the optical fibre, by employing modulation of eigenvalues, will be presented.

Darko Zibar

He received the M.Sc. degree in telecommunication and the Ph.D. degree in optical communications from the Technical University of Denmark, in 2004 and 2007, respectively. He was a Visiting Researcher with the Optoelectronic Research Group (Prof. John E. Bowers), University of California, Santa Barbara, CA, USA, in 2006 and 2008, where he worked on coherent receivers for analog optical links. In 2009, he was a Visiting Researcher with Nokia-Siemens Networks, where he worked on clock recovery techniques for polarization multiplexed systems. He is currently Associate Professor at DTU Fotonik, Technical University of Denmark. His research efforts are currently focused on the application of machine learning methods to optical communication, ultra-sensitive amplitude and phase detection and optical fibre sensing systems. He is a recipient of Young Researcher Award by University of Erlangen-Nurnberg, in 2016, for his contributions to applications of machine learning techniques to optical technologies. He was a part of the team that won the HORIZON 2020 prize for breaking the optical transmission barriers. In 2017, he was granted European Research Council (ERC) Consolidator Grant where the focus is on the demonstration of nonlinear-distortion free optical communication systems by employing modulation of eigenvalues.

INVITED SPEAKER IS2

Saturday, September 21
10:30-11:00 (OLEANDAR)

Ray Perez, PhD

Office of Naval Research,
USA

AI Based Tutors: Past, Present, and Future

With the spread of global competition the United States, as well, other western industrialized nations must develop a world-class workforce. Today's approaches in education and training must change if any nation is to be completive in the dynamic global market place. Our citizens must be proficient in mathematics interested in science, technology, engineering, mathematics, and (STEM) careers. One possible solution is the leveraging of AI technologies in education and training, specially, the augmentation of classroom teaching with intelligent tutoring technologies. Our hypothesize is that the use of AI technologies will enable us to produce a world class workforce that will be competitive in the global economy (Robelen, 2012). Numerous studies have shown that an effective way to teach is through one-on-one interactions between students and teachers (Bloom, 1984). A feasible way of achieving one-on-one instruction is by the use of advanced technologies. On such technologies is Intelligent Tutoring Systems (ITS). ITS have been showed to be effective with an effect size on average of d= 47 This is based on several recent meta-analytics studies (Kulick & Fletcher 2012; VanLehn,2011; & Grasser,2013). In this talk I will first provide a definition of ITS with a short history of the development of ITS. Followed by a current state- of- the- art assessment. The talk will concluded with a discussion of future challenges and how ITS technologies may evolve in the future.

Ray Perez

He is a senior scientist and Program Officer at the Office of Naval Research in Arlington, VA. In this capacity, he is responsible for managing ONR's Cognitive Science of Learning Program. This program has two major interdisciplinary and highly intertwined thrusts. Specifically, he is responsible for (1) training/education research and their core technologies, and (2) individual differences research. He also served as the Service training lead for the Human Systems Community of Interest for DoD. The training technologies thrust include research on the use of various artificial intelligence methods and techniques to enhance the design of AI based tutors, interoperable and transportable simulations, computer games(e.g. game theory), and web-based instruction The goal of the thrust is to leverage cognitive theories of learning and teaching during their early instructional design phases. The individual differences thrus ts consist of research in perceptual (e.g., visual memory) and cognitive abilities (e.g., working memory). Dr. Perez is conducting research in the development of new theories and methods for the assessment of human abilities. Its goal is to provide the underlying science and technology for effectiveness. Recognized as a DoD leader in learning, he was asked by the Chief of Naval Research to be the lead program manager for ONR's STEM grand challenge. This program's primary objective is to develop the next generation of Intelligent tutors in four STEM areas that are faster, cheaper, and better (e.g., achieve a 2 sigma improvement in performance).Another objective of this research effort was to apply what is learned in creating STEM tutors to military training. Dr. Perez's research in the areas of technology-based education and training spans over 30 years. Throughout his career, he has received numerous awards for his work in advanced learning technologies. He has edit six books on the use of technology in education and training. The most recent, Using Games and Simulations for Teaching and assessment: Key Issues ,published by Routledge, 2016. A completed list of his numerous book chapter, scientific journal articles, technical reports and presented scientific papers at professional meetings will be provide upon request. Prior to coming to ONR he served as program manager for the Presidential Technology Initiative Program at the Department of Defense Education Activity (DoDEA). While at DoDEA he was the Director of the K–12 program within the Advanced Distribute Learning Initiative, sponsored by the Office of the Secretary of Defense, Readiness and Training. Earlier, he was principal scientist in Simulation and Advanced Instructional Systems, at the U.S. Army Research Institute for the Social and Behavioral Sciences (ARI) and was an assistant professor, in the Department of Psychology, at California State University Dominguez Hills, California. Dr. Perez continues to serve as an educational technology expert on various review panels including the National Science Foundation (NSF), National Academy Sciences (NAS), Defense Advanced Research Agency (DARPA), and JCP-1 for Modelling and Simulation, USARMY MEDCOM USAMRMC (US). Dr. Perez received a Doctorate and Master's degree Cognitive Psychology from the University of California, Los Angeles California. Dr. Perez was the co-chair of NATO Human Factors and Medicine Panel's HFM-RTG 237 Assessment of Intelligent Tutoring Systems Technologies and opportunities.

TECHNICAL PROGRAM: GENERAL CONFERENCE

Thursday, September 19, 09:00 - 10:30
(OLEANDAR)

S1: NETWORK SOFTWARIZATION

Chair: Darko Huljenić (Ericsson Nikola Tesla, Croatia)

NFV Resource Advertisement and Discovery Protocol for a Distributed NFV Orchestration in a WMN-based Disaster Network
Gregor Frick, Auberlin Paguem Tchinda, Armin Lehmann and Ulrich Trick (Frankfurt University of Applied Sciences, Germany); Bogdan Ghita (University of Plymouth & Centre for Security, Communications, and Network Research, United Kingdom (Great Britain))

Throughput evaluation of kernel based packet switching in a multi-core system
Djani Vladislavic and Gregori Topic (Ericsson Nikola Tesla, Croatia); Katarina Anđela Vrgoč and Julije Ozegovic (University of Split, Croatia); Darko Huljenić (Ericsson Nikola Tesla d. d., Croatia)

Dynamic Handler Framework for Network Slices Management
Amal Kammoun (Higher School of Communications of Tunis, Tunisia); Nabil Tabbane (SupCom, Tunisia); Gladys Diaz (University of Paris 13 & L2TI, Institut Galilee, France); Nadjib Achir (University of Paris 13 & L2TI - University of Paris 13, France); Abdulhalim Dandoush (ESME Sudria, France)

Development and Implementation of Enhanced Segmentation Algorithm in Software Defined Networks
Dmitry Perepelkin (RSREU, Russia); Ilya Tsyganov (Ryazan State Radio Engineering University, Russia)

Deep and Automated SDN Data Plane Analysis
Wejdene Saied and Nihel Ben youssef (Carthage University, SUP'COM, Tunisia); Amina Saadaoui (University of Carthage, Tunisia); Adel Bouhoula (Higher School of Communications of Tunis, Tunisia)

Latency analysis in kernel based packet switching in multi-core system
Gregori Topic and Djani Vladislavic (Ericsson Nikola Tesla, Croatia); Ivana Ribicic (University of Split, Croatia); Darko Huljenić (Ericsson Nikola Tesla d. d., Croatia); Julije Ozegovic (University of Split, Croatia)

Thursday, September 19, 11:00 - 12:30
(OLEANDAR)

S2: DATA ANALYTICS

Chair: Matko Šarić (University of Split, Croatia)

A Dataset for Evaluating Query Suggestion Algorithms in Information Retrieval
Ioan Badarinza and Adrian Sterca (Babes-Bolyai University, Romania); Darius Bufnea (Babeș-Bolyai University, Romania)

Custom Validation Procedure for Tesys Recommender System
Oana Maria Teodorescu, Stefan Paul Popescu and Mihai Lucian L Mocanu (University of Craiova, Romania); Cristian Mihaescu (University of Craioiva, Romania)

Video Transcript Indexing and Retrieval Procedure
Gabriel Turcu (University of Craiova, Romania); Cristian Mihaescu (University of Craioiva, Romania); Stella Heras and Javier Palanca (Universitat Politècnica de València, Spain); Vicente Julián (Universidad Politecnica de Valencia, Spain)

Classification using Discriminative Restricted Boltzmann Machines on Spark
Maria Varsamou and Theodore A. Antonakopoulos (University of Patras, Greece)

Anomaly Detection in Smart City Traffic Based on Time Series Analysis
Mohammad Bawaneh and Vilmos Simon (Budapest University of Technology and Economics, Hungary)

Bicycle route planning using multiple criteria GIS analysis
Jurica Đerek and Marjan Sikora (University of Split, Croatia)

Topic modeling in medical data analysis. Case study based on medical records analysis
Adriana M Coroiu (BABES-BOLYAI University, Romania); Alina Calin (Babeș-Bolyai University, Romania); Maria Nutu (Babes-Bolyai University, Romania)

Thursday, September 19, 14:30 - 16:00
(OLEANDAR)

S3: MACHINE LEARNING APPLICATIONS

Chair: Gordan Ježić (University of Zagreb, Croatia)

A Machine Learning Model to Resource Allocation Service for Access Point on Wireless Network
Davi Militani and Samuel Terra (UFLA, Brazil); Everthon Valadao (IFMG, Brazil); Katia Neles (Faculdade Martha Falcão, Brazil); Renata Rosa (University of São Paulo, Brazil); Demostenes Zegarra Rodriguez (University of Sao Paulo & Nokia Technology Institute, Brazil)

A Versatile 3D Face Reconstruction from Multiple Images for Face Shape Classification
Alexandru I. Marinescu and Tudor Alexandru Ileni (Babes Bolyai University, Romania); Adrian Sergiu Darabant (Babes Bolyai University & Cluj Napoca, Romania)

Crop Classification using Multi-spectral and Multi-temporal Satellite Imagery with Machine Learning
Lucija Viskovic, Ivana Nizetic Kosovic and Toni Mastelic (Ericsson Nikola Tesla, Croatia)

Toward a smart real time monitoring system for drinking water based on machine learning
Jalal Dziri (National Engineering School of Tunis, Tunisia); Tahar Ezzedine (Tunis El Manar University, Tunisia)

Anomaly detection based on fixed and wearable sensors in assisted living environments
Katarina Mandarić, Pavle Skocir and Marin Vukovic (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia); Gordan Jezic (University of Zagreb, Croatia)

A study in the automation of service ticket recognition using natural language processing
Tolciu Tudor Dumitru (Babes Bolyai University, Romania); Christian Săcărea (Babeș-Bolyai University, Romania); Cristian Matei (Babes Bolyai University, Romania)

Thursday, September 19, 09:00 - 10:30
(RUŽMARIN)

S4 / I: SIGNAL PROCESSING AND CODING I

Chair: Joško Radić (University of Split, Croatia)

Frequency Offset Estimation from Coded Transmission over Flat Rayleigh Fading Channel: Bounds and Algorithms
Monia Salem, Slaheddine Jarboui and Ammar Bouallegue (National School of Engineers of Tunis, Tunisia)

Lossless audio coding using extended Activity Level Classification Model
Cezary Wernik (West Pomeranian University of Technology Szczecin & Faculty of Computer Science and Information Technology, Poland); Grzegorz Ulacha (West Pomeranian University of Technology Szczecin, Poland)

Audio lossless encoding with adaptive Context-Dependent Constant Component Removing
Cezary Wernik (West Pomeranian University of Technology Szczecin & Faculty of Computer Science and Information Technology, Poland); Grzegorz Ulacha (West Pomeranian University of Technology Szczecin, Poland)

Evaluation of Speech Quality Degradation due to Atmospheric Phenomena
Marielle Jordane (UFLA, Brazil); Demóstenes Zegarra Rodríguez (Federal University of Lavras, Brazil); Dante Coaquira Begazo (University of Sao Paulo, Brazil)

A Speech Quality Classifier based on Signal Information that Considers Wired and Wireless Degradations
Davi Militani (UFLA, Brazil); Dante Coaquira Begazo (University of Sao Paulo, Brazil); Renata Rosa (University of São Paulo, Brazil); Demóstenes Zegarra Rodríguez (Federal University of Lavras, Brazil)

Thursday, September 19, 11:00 - 12:30 (RUŽMARIN)

S4 / II: SIGNAL PROCESSING AND CODING II

Chair: Joško Radić (University of Split, Croatia)

Anomaly Detection for Industrial Control Systems Using K-Means and Convolutional Autoencoder
Chun-Pi Chang (National Chung Hsing University, Taiwan); Wen-Chiao Hsu (National Taichung University of Science and Technology, Taiwan); I-En Liao (National Chung Hsing University, Taiwan)

Performance study of a class of irregular LDPC codes based on their weight distribution analysis
Francesca Vatta, Fulvio Babich, Flavio Ellero, Matteo Noschese, Giulia Buttazzoni and Massimiliano Comisso (University of Trieste, Italy)

Performances Analysis of Polar Codes Decoding Algorithms over Polar-Coded SCMA System
Imen Abidi (Sup'com, Tunisia); Moez Hizem (Sup'Com, Tunisia); Iness Ahriz (CNAM, France); Maha Cherif (Innov'Com Lab, Tunisia); Ridha R. Bouallegue, B. (Ecole Supérieure des Communications de Tunis, Tunisia)

Framework For UAV Mobile Object Tracking based on UE4SIM
Aicha Idriss Hentati (National Engineering School, University of sfax & Digital Research Center of SFAX (CRNS), TUNISIE, Tunisia); Lamia Chaari Fourati (Institut Supérieur d'Informatique et de Multimédia de Sfax, Tunisia)

New very simply explicitly invertible approximation of the Gaussian Q-Function
Alessandro Soranzo, Francesca Vatta, Massimiliano Comisso, Giulia Buttazzoni and Fulvio Babich (University of Trieste, Italy)

Comparison study of the adaptability of layered and stream replication variants of the WebRTC simulcast
Robert Chodorek (The AGH University of Science and Technology, Poland); Agnieszka Chodorek (Kielce University of Technology, Poland); Krzysztof Wajda (AGH University of Science and Technology, Poland)

Thursday, September 19, 14:30 - 16:00 (RUŽMARIN)

S5: 5G TECHNOLOGIES

Chair: Åke Arvidsson (Kristianstad University, Sweden)

Web Metrics for the Next Generation Performance Enhancing Proxies
Åke Arvidsson (Kristianstad University, Sweden); Karl-Johan Grinnemo (Karlstad University, Sweden); Eric Zhi Chen (Kristianstad University College, Sweden); Qinghua Wang (Kristianstad University SWEDEN, Sweden); Anna Brunstrom (Karlstad University, Sweden)

A Combined Static/Dynamic Partitioned Resource Usage Approach for Random Access in 5G Cellular Networks
Ogechi Akudo Nwogu (University Paris 13 Villetaneuse, France); Gladys Diaz (University of Paris 13 & L2TI, Institut Galilee, France); Marwen Abdennebi (L2TI Laboratory, University of Paris Nord, France)

Estimation of the Bit Error Rate (BER) for Uplink Millimeter-Wave Line-of-Sight Communications
Massimiliano Comisso, Francesca Vatta, Giulia Buttazzoni and Fulvio Babich (University of Trieste, Italy)

A Design of Metamaterials MIMO Antenna for Millimeter Wave Application
Mondher Labidi and Fethi Choubani (Innov'com, Tunisia)

Massive MIMO uplink channel estimation using compressive sensing
Noura Lahbib, Maha Cherif, Moez Hizem and Ridha Bouallegue (Carthage University, Sup'Com, Innov'Com, Tunisia)

Context-aware K8S scheduler for real time distributed 5G edge computing applications
Michael Chima Ogbuachi (BME - Budapest University of Technology and Economics, Hungary); Chinmay Gore (Budapest University of Technology and Economics, Hungary); Anna Reale (ELTE Eötvös Loránd University, Hungary); Peter Suskovics (Ericsson, Hungary); Benedek Kovacs (BUTE, Hungary)

Friday, September 20, 14:30 - 16:00 (RUŽMARIN)

S6: WIRELESS COMMUNICATIONS

Chair: Zoran Blažević (University of Split, Croatia)

Wireless Access Point Positioning Optimization
Samuel T Vieira (Universidade Federal de Lavras, Brazil); Everthon Valadao (IFMG, Brazil); Demostenes Zegarra Rodriguez (University of Sao Paulo & Nokia Technology Institute, Brazil); Renata Rosa (University of São Paulo, Brazil)

Spectral and Network Deployment Efficiency Analysis in a K-Tier Network
Jasmin Musovic (Communications Regulatory Agency, Bosnia and Herzegovina); Vlatko Lipovac and Adriana Lipovac (University of Dubrovnik, Croatia)

A New Algorithm with Adaptive Power Allocation (APA) for Variable Transmit Antenna Selection under MISO-SCMA Systems
Musa Civil and Ozgur Ertug (Gazi University, Turkey)

Multi-hop Cluster Zones Routing protocol for Heterogeneous Wireless Sensor Networks (HWSNs)
Djamal Djabour, Wided Abidi and Tahar Ezzedine (National Engineers School of Tunis, Tunisia)

Low Power and Lossy Networks LLNs: cross-layer optimization
Jalal Dziri, Mohamed Hechmi Jeridi and Tahar Ezzedine (National Engineering School of Tunis, Tunisia)

MoM-GEC Modeling of Gap Discontinuity for The Optimization of PIN Diode Dimension Used in Frequency Reconfigurable Antenna
Heithem Helali (National Engineering School of Tunis (ENIT) & SYSCOM, Tunisia); Mourad Aidi (National Engineering School of Tunis, Tunisia); Taoufik Aguili (Laboratoire des Systèmes de Communications, Tunisia)

Thursday, September 19, 11:00 - 12:30 (PALMA I)

S7: OPTICAL COMMUNICATIONS

Chair: Darko Zibar (University of Copenhagen, Denmark)

The performance of ASON/GMPLS network with hierarchical control plane structure
Magdalena Młynarczuk (Gdańsk University of Technology & Politechnika Gdańska, Poland); Sylwester Kaczmarek (Gdansk University of Technology & Faculty ETI, Poland)

GPON Network with Simulated Rogue ONU
Tomas Horvath (Brno University of Technology, Czech Republic); Petr Munster (Brno University of Technology & CESNET, Czech Republic); Vaclav Oujezsky (Brno University of Technology, Czech Republic); Josef Vojtech (CESNET, a.l.o., Czech Republic); Martin Holik, Petr Dejdar and Michal Latal (Brno University of Technology, Czech Republic)

Performance of Three Dimensional Diagonal Eigenvalue Unity /Multi-Diagonal Code for OCDMA System
Nabiha Jellali (Syscom- ENIT, Tunisia); Moez Ferchichi (Ecole Nationale d'Ingénieurs de Tunis, Tunisia); Monia Najjar Bounouh (Syscom, Tunisia)

Thursday, September 19, 14:30 - 16:00 (PALMA I)

S8: SOFTWARE DEVELOPMENT METHODS

Chair: Linda Vicković (University of Split, Croatia)

Multi-way Divide and Conquer Parallel Programming based on PLists
Virginia Niculescu (Babes-Bolyai University of Cluj-Napoca, Romania); Darius Bufnea (Babeș-Bolyai University, Romania); Adrian Sterca (Babes-Bolyai University, Romania); Robert Silimon (Babes-Bolyai University of Cluj-Napoca, Romania)

Cross-project estimation of software development effort using in-house sources and data mining methods - an experiment
Hrvoje Karna (Croatian Defence Academy, Croatia); Ana Masnov (Croatian Defense Academy, Croatia); Darija Jurko and Tomislav Perić (Croatian Defence Academy, Croatia)

A Graph Based Knowledge and Reasoning Representation Approach for Modeling MongoDB Data Structure and Query
Camelia Florina Andor (Babes-Bolyai University, Romania); Viorica Varga (Babes Bolyai University, Romania); Christian Săcărea (Babeș-Bolyai University, Romania)

Friday, September 20, 16:30 - 18:00 (OLEANDAR)

P1: POSTERS / ABSTRACTS SESSION

Chair: Matko Šarić (University of Split, Croatia)

Testing Metal Density in Shielded Fabric
Damir Muha (University of Zagreb, Croatia); Kresimir Malaric and Nikola Banović (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)

SPECIAL SESSIONS AND SYMPOSIA

SS1: SPECIAL SESSION ON AD-HOC&SENSORS NETWORKS AND IoT

Friday, September 20, 09:00 - 10:30 (OLEANDAR)

SS1: Special Session on Ad Hoc&Sensor Networks and IoT

Chair: Petar Šolić (University of Split, Croatia)

A Distributed Collision-free Distance-2 Coloring Algorithm for Ring Networks
Hicham Lakhlef (Université de Technologie de Compiègne, France); Imine Youcef (University de Technologie de Compiègne, France); Abdelmadjid Bouabdallah (Universite de Technologie - Compiegne, France)

On the coexistence of LoRaWAN and legacy short range devices in unlicensed bands in Europe
Lorenzo Vangelista (University of Padova, Italy); Luca Dell'Anna (Independent Consultant, Italy); Ivano Calabrese (A2ASmartCity, Italy)

Energy efficient data gathering schema for Wireless Sensor Network: A Matrix Completion based approach
Manel Kortas (University of Tunis El Manar & University of Limoges, Tunisia); Oussama Habachi (XLIM, France); Ammar Bouallegue (National School of Engineers of Tunis, Tunisia); Vahid Meghdadi (University of Limoges, France); Tahar Ezzedine (Tunis El Manar University, Tunisia); Jean Pierre Cances (University of Limoges, France)

An Event-based Local Action Model for Queriable Wireless Sensor Actuator Networks
René Bergelt (TU Chemnitz, Germany); Wolfram Hardt (Chemnitz University of Technology, Germany)

Smart Parking Sensor Performance Evaluation
Petar Šolić and Toni Perkovic (University of Split, FESB, Croatia); Toni Konsa (University of Split, Croatia); Hamid Zargariasl (University of Split, FESB, Croatia); Luigi Patrono (University of Salento, Italy)

Performance Evaluation of AODV and OAODV for Several WSN/IoT Applications
Amira Zrelli, Hacen Khlaifi and Tahar Ezzedine (Enit & Enit, Tunisia)

SS2: SPECIAL SESSION ON SMART ENVIRONMENTS AND IoT

Friday, September 20, 14:30 - 16:00 (OLEANDAR)

SS2: Special Session on Smart Environments and IoT

Chair: Maja Stella (University of Split, Croatia)

Dynamic Control-as-a-Service provisioning in Fog computing
Marcus Vinícius Souza Costa, Vitor B Souza and Sócrates S Araújo Júnior (Universidade Federal de Viçosa, Brazil)

Location-based service sharing for smart museum
Iness Ahriz (CNAM, France); Jean-Michel Douin (CNAM & Cédric/SEMPIA, France); Frédéric Lemoine (CNAM, France)

Evaluation and improvement of localization algorithms based on UWB Pozyx system
Karim Mimoune (Laboratoire Commun de Métrologie LCM & Conservatoire National des Arts et Metier, France); Iness Ahriz (CNAM, France); Joffray Guillory (Laboratoire Commun de Métrologie LCM, France)

Building an IoT Public Network Infrastructure
Gian Paolo Jesi (Lepida ScpA, Italy); Elisa Benetti (LepidaScpA, Italy); Gianluca Mazzini (LepidaSpA & UniFe, Italy)

An Interoperable Integration Model for Bluetooth Devices in the Internet of Things
Danilo F S Santos, Bruna Salles Moreira, Christian Charles Dias, Kyller Costa Gorgônio and Angelo Perkusich (Federal University of Campina Grande, Brazil)

Monitoring and Classification of Emotions in Elderly People
Davy Fonseca (UFLA, Brazil); Katia Neles (Faculdade Martha Falcão, Brazil); Renata Rosa (University of São Paulo, Brazil); Demóstenes Zegarra Rodríguez (Federal University of Lavras, Brazil)

SS3: SPECIAL SESSION ON QoS IN WIRED AND WIRELESS NETWORKS

Friday, September 20, 09:00 - 10:30 (RUŽMARIN)

SS3: Special Session on QoS in Wired and Wireless Networks

Chair: Pascal Lorenz (University of Haute Alsace, France)

Performance Evaluation of a C-RAN Supporting Quasi-Random Traffic
Iskanter-Alexandros Chousainov, Ioannis Moscholios and Alexandros Kaloxylos (University of Peloponnese, Greece); Michael D. Logothetis (University of Patras, Greece)

Interference Aware Algorithm For D2D Communications Underlay Cellular Network: A Mixed Strategy Approach
Sawsan Selmi (University Tunis El Manar & Tunisia, Tunisia); Ridha R. Bouallegue, B. (Ecole Supérieure des Communications de Tunis, Tunisia)

Video Quality Assessment in the DASH Technique
Janusz Henryk Klink, Mateusz Pasławski and Piotr Pawłowski (Wroclaw University of Science and Technology, Poland); Tadeus Uhl (Maritime University of Szczecin/Poland, Poland)

Double Full Diversity Using a New Efficient Distributed Space Time Block Coding in Cooperative Relay Network
Abdulghani M Elazreg (University of Derby & UK, United Kingdom (Great Britain)); Ahmad Kharaz (University of Derby, United Kingdom (Great Britain))

An analysis of sender-driven WebRTC congestion control coexisting with QoS assurance applied in IEEE 802.11 wireless LAN
Robert Chodorek (The AGH University of Science and Technology, Poland); Agnieszka Chodorek (Kielce University of Technology, Poland); Krzysztof Wajda (AGH University of Science and Technology, Poland)

Quality Parameters in IMS/NGN Networks
Sylwester Kaczmarek (Gdansk University of Technology & Faculty ETI, Poland); Maciej Sac (Gdansk University of Technology & Faculty of Electronics, Telecommunications and Informatics, Poland)

SS4: SPECIAL SESSION ON ADVANCED EDUCATIONAL TECHNOLOGIES

Saturday, September 21, 08:30 - 10:00 (OLEANDAR)

SS4: Special Session on Advanced Educational Technologies

Chair: Ani Grubišić (University of Split, Croatia)

Approaches to Enhancing Transfer of Training using Adaptive Instructional Systems
Jeremiah T Folsom-Kovarik, Behrooz Mostafavi and Robert Sottilare (Soar Technology, Inc., USA); Ian Davidson (University of California - Davis, USA); Ray Perez (Office of Naval Research, Croatia); Peter Walker (US Office of Naval Research, USA)

Adaptive Learning System in Automotive Software Engineering
Norbert Englisch, Ariane Heller, Uranchimeg Tudevdagva, Jonas Tonndorf-Martini, Lucas Gaitzsch and Wolfram Hardt (Chemnitz University of Technology, Germany)

Workstation Cellular Framework for Computer Aided Design Interactive Online Courses
Ingmar Besic and Almir Karabegovic (University of Sarajevo, Bosnia and Herzegovina); Mirza Ponjavic (International Burch University Sarajevo, Bosnia and Herzegovina)

Moodle as a Platform for Increasing Student Engagement in the Blended Learning Environment
Matea Markić Vučić (SPARK School, Bosnia and Herzegovina)

Remembrance of Things Past and the Path to Digital Tutoring
John D Fletcher (Institute for Defense Analyses, USA)

Automatic categorization of educational videos according to learning styles
Marius Andrei Ciurez (University of Craiova, Romania); Cristian Mihaescu (University of Craioiva, Romania); Maite Gimenez, Stella Heras, Javier Palanca and Vicente Julián (Universidad Politecnica de Valencia, Spain)

SS5: SPECIAL SESSION ON ROBOTIC AND ICT ASSISTED WELLBEING

Friday, September 20, 14:30 – 16:00 (PALMA I)

SS5: Special Session on Robotic and ICT Assisted Wellbeing

Chair: Mirjana Bonković (University of Split, Croatia)

Design and control of an educational redundant 3D printed robot
Ivan Chavdarov (Institut of Robitics, Bulgarian Academy of Sciences & Sofia University "St. Kliment Ohridski", FMI, Bulgaria); Valentin Nikolov (Sensata Technologies, Bulgaria); Bozhidar Naydenov (Institut of Robitics, Bulgarian Academy of Sciences, Bulgaria); George Boiadjiev (University of Sofia "St. Kliment Ohridski", Bulgaria)

Social Robots as Cyber-Physical Actors in Entertainment and Education
Chris Lytridis (International Hellenic University, Greece); Violina Vasileva-Aleksandrova (Theater Tsvete, Bulgaria); Youssfi Mohamed (Labo SSDIA, ENSET Mohammedia, Morocco); Christos Bazinas (International Hellenic University, Greece); Vassilios Ferelis (Eastern Macedonia Institute of Technology Technology (EMaTTech), Greece); Alexander Jaki (International Hellenic University, Greece); Mohammed Mestari (University Hassan II Mohammedia & ENSET Mohammedia, Morocco); Vasileios Kaburlasos (Technological Educational Institute of Eastern Macedonia and Thrace, Greece)

Dynamics and control of a 3D printed walking robot
Aleksander Stefanov (Sofia University "St. Kliment Ohtidski", Bulgaria); Ivan Chavdarov (Institut of Robitics, Bulgarian Academy of Sciences & Sofia University "St. Kliment Ohridski", FMI, Bulgaria); Dimitar Nedanovski (Sofia University "St. Kliment Ohridski", Bulgaria); George Boiadjiev (University of Sofia "St. Kliment Ohridski", Bulgaria)

NAO Robot as Demonstrator of Rehabilitation Exercises after Fractures of Hands
Zdenko Kovacic (University of Zagreb, Croatia); Dora Matić (University of Zagreb Faculty of EE&C, Croatia)

SYM1/I: SYMPOSIUM ON GREEN NETWORKING AND COMPUTING I

Saturday, September 21, 08:30 - 10:00 (PALMA I)

SYM1/I: Symposium on Green Networking and Computing I

Chair: Josip Lorincz (University of Split, Croatia)

Energy Optimal Partial Computation Offloading Framework for Mobile Devices in Multi-access Edge Computing
Sonali Chouhan (Indian Institute of Technology Guwahati, India)

Multi-Radio Access Network Assignment Using Dynamic Programming
Vianney Anis and Stephan Weiss (University of Strathclyde, United Kingdom (Great Britain))

Spectrum Allocation and Power Management using Markov Chains and Beamforming in Underlay Cognitive Radios
Sasank Gurajapu, Sarvesh Raj and Sonali Chouhan (Indian Institute of Technology Guwahati, India)

SYM1/II: SYMPOSIUM ON GREEN NETWORKING AND COMPUTING II

Saturday, September 21, 10:30 - 12:00 (PALMA I)

SYM1/II: Symposium on Green Networking and Computing II

Chair: Josip Lorincz (University of Split, Croatia)

Optimized Energy Consumption in Linear Slotted Aloha Ad Hoc Networks with Equidistant Hops
Bruna Silva and Renato M. de Moraes (Federal University of Pernambuco (UFPE), Brazil)

Narrowband Powerline Communication Measurement and Analysis in the Low Voltage Distribution Network
Raja Alaya (University of Carthage & Tunisia Polytechnic School, Tunisia); Rabah Attia (Tunisia Polytechnic School, University of Carthage, Tunisia)

Reducing Data Center Power Losses through UPS Serial Consolidation
Fawaz AL-Hazemi (KAIST, Korea); Josip Lorincz (University of Split, Croatia); Alaelddin Fuad Yousif Mohammed (Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea, Korea); Fahad Salamh (Purdue University, USA)

SYM2/I: SYMPOSIUM ON SECURITY AND DIGITAL FORENSICS I

Saturday, September 21, 08:30 - 10:00 (RUŽMARIN)

SYM2/I: Symposium on Security and Digital Forensics I

Chair: Toni Perković (University of Split, Croatia)

A Secure Network Architecture for Heterogeneous IoT Devices using Role-based Access Control
Tinthid Jaikla (NECTEC, Thailand); Chalee Vorakulpipat (National Electronics and Computer Technology Center, Thailand); Ekkachan Rattanalerdnusorn (NECTEC, Thailand); Dang Hai Hoang (Ministry of Information and Communications & Post and Telecommunication Institute of Technology, Vietnam)

Dangers and prevalence of unprotected Web fonts
Tobias Mueller and Daniel Klotzsche (Uni Hamburg, Germany); Dominik Herrmann (Uni Bamberg, Germany); Hannes Federrath (Uni Hamburg, Germany)

Anomaly-based Intrusion Detection in Industrial Data with SVM and Random Forests
Simon Duque Anton and Sapna Sinha (German Research Center for Artificial Intelligence, Germany); Hans Dieter Schotten (Deutsches Forschungszentrum für Künstliche Intelligenz GmbH, Germany)

Surfing the Web quicker than QUIC via a shared Address Validation
Erik Sy (Universität Hamburg, Germany)

Comparison of Cuckoo Hash Table and Bloom Filter for Fast Packet Filtering Using Data Plane Development Kit
Miljenko Mikuc, Ivan Sičić, Karlo Slovenec and Lucija Petricioli (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)

An Efficient Hidden Markov Model for Anomaly Detection In CAN Bus Networks
Safa Boumiza (PRINCE Research Laboratory, ISITCOM-University of Sousse, Tunisia); Rafik Braham (ISITC-HS, University of Sousse, Tunisia)

Cyber Security and Information Exchange Analysis of Automatic Dependent Surveillance Broadcast
Philipp Ortner (Graz University of Technology, Austria); Holger Fluehr (FH-Joanneum, Austria); Erich Leitgeb (Graz University of Technology, Austria)

SYM2/II: SYMPOSIUM ON SECURITY AND DIGITAL FORENSICS II

Saturday, September 21, 10:30 - 12:00 (RUŽMARIN)

SYM2/II: Symposium on Security and Digital Forensics II

Chair: Toni Perković (University of Split, Croatia)

A Multi-Model-based Approach to Detect Cyber Stealth Attacks in Industrial Internet of Things
Calin Enachescu, Hunor Sandor and Bela Genge (University of Medicine, Pharmacy, Sciences and Technology of Targu Mures, Romania)

Manual IoT Forensics of a Samsung Gear S3 Frontier Smartwatch
Seila Becirovic and Sasa Mrdovic (University of Sarajevo, Bosnia and Herzegovina)

Anomaly-based Intrusion Detection Using Auto-encoder
Yves Nguimbous Nsoga (Higher School of Communications of Tunis & Digital Security Research Laboratory, Tunisia); Riadh Ksantini and Adel Bouhoula (Higher School of Communications of Tunis, Tunisia)

Secure Hybrid Publish-Subscribe Messaging Architecture
Matevž Vučnik (Jožef Stefan Institute, Slovenia); Ales Svigelj and Gorazd Kandus (Jozef Stefan Institute, Slovenia); Mihael Mohorcic (Jozef Stefan Institute & Jozef Stefan International Postgraduate School, Slovenia)

Optimization of Parallel Firewalls Filtering Rules
Taha Elamine Hadjadj and Rim Tebourbi (Higher School of Communication of Tunis, Tunisia); Adel Bouhoula and Riadh Ksantini (Higher School of Communications of Tunis, Tunisia)

Dimensions of 'Socio' Vulnerabilities of Advanced Persistent Threats
Mathew Nicho (Zayed University, United Arab Emirates)

SYM3/I: SYMPOSIUM ON ENVIRONMENTAL ELECTROMAGNETIC COMPATIBILITY (EEMC) I

Thursday, September 19, 09:00 - 10:30 (PALMA I)

SYM3/I: Symposium on Environmental Electromagnetic Compatibility (EEMC) I: Grounding Penetrating Radar (GPR) Applications and Bioelectromagnetics

Co-chairs: Dragan Poljak and Vesna Roje (University of Split, Croatia)

SPOT-GPR analysis of ground penetrating radar signals recorded over the gneiss 14/20 region of the IFSTTAR geophysical test site: preliminary results
Lara Pajewski (Sapienza University of Rome, Italy); Simone Meschino (Airbus, Italy)

Analytical versus Numerical Approach to the Analysis of Dipole Antenna Radiated Field over a Lossy Ground
Dragan Poljak and Anna Susnjara (University of Split, Croatia); Ana Džolić (FESB, Croatia)

Indoor Channel Characterization for GPR Electromagnetic Compatibility
Maja Škiljo, Zoran Blažević and Dragan Poljak (University of Split, Croatia)

Stochastic-Deterministic Boundary Integral Method for Transcranial Electric Stimulation: A Cylindrical Head Representation
Anna Susnjara (University of Split, Croatia); Jure Ravnik (University of Maribor, Faculty of Mechanical Engineering, Slovenia); Ožbej Verhnjak (University of Maribor, Slovenia); Dragan Poljak and Mario Cvetković (University of Split, Croatia)

Near electric field around the shipboard navigational radar patch array antenna: comparison to human exposure limits
Andela Matkovic and Antonio Sarolic (FESB, University of Split, Croatia)

SYM3/II: SYMPOSIUM ON ENVIRONMENTAL ELECTROMAGNETIC COMPATIBILITY (EEMC) II

Friday, September 20, 16:30 - 18:00 (OLEANDAR)

SYM3/II: Symposium on Environmental Electromagnetic Compatibility (EEMC) II

Co-chairs: Dragan Poljak and Vesna Roje (University of Split, Croatia)

Reduction of a Cone-Shaped Terrain Grounding Resistance by Remote Grounding
Antonio Sunjerga and Farhad Rachidi (EPFL, Switzerland); Marcos Rubinstein (University of Applied Sciences of Western Switzerland, Averdon, Switzerland); Dragan Poljak (University of Split, Croatia)

Reduction of a Cone-Shaped Terrain Grounding Resistance by Remote Grounding
Antonio Sunjerga and Farhad Rachidi (EPFL, Switzerland); Marcos Rubinstein (University of Applied Sciences of Western Switzerland, Averdon, Switzerland); Dragan Poljak (University of Split, Croatia)

Multi-variable analysis of the transient impedance of the horizontal grounding electrode
Hrvoje Ilić (Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Croatia); Ante Rubic and Silvestar Sesnic (University of Split, Croatia)

Frequency Domain Grounding Grid Analysis Based on the Finite Element Technique
Slavko Vujević, Ivan Krolo and Dino Lovrić (University of Split, Croatia)

Simulation of Lightning Current Distributions in a realistic Human Head Model
Rene Machts and Alexander Hunold (Technische Universität Ilmenau, Germany); Michael Rock (TU Ilmenau, Germany); Carsten Leu (Technische Universität Ilmenau, Germany); Jens Haueisen (Technical University Ilmenau, Germany)

Analysis of a current induced along the horizontal grounding electrode due to short-circuit generator current
Ante Soldo (FESB, University of Split, Croatia); Silvestar Sesnic (University of Split, Croatia)

PROFESSIONAL PROGRAM

Thursday, September 19, 09:00 - 10:30 (PALMA II)

WICT/I: Workshop on Information and Communication Technologies I

Chair: Toni Mastelić (Ericsson Nikola Tesla, Croatia)

Web interface for managing an Internet of Things Public Network
Elisa Benetti (LepidaScpA, Italy); Gian Paolo Jesi (Lepida ScpA, Italy); Gianluca Mazzini (LepidaSpA & UniFe, Italy)

LepidaScpa 4 IOT
Stefania Nanni (Lepida ScpA, Italy); Gianluca Mazzini (LepidaSpA & UniFe, Italy)

PA's Data Center Management: the Emilia Romagna Region use case
Enrica Salbaroli (Lepida SpA, Italy); Gianluca Mazzini (University of Ferrara and LepidaSpA, Italy)

Child-Centered Design of Edutainment Applications for Preschoolers. A two step method proposal
Adriana Guran and Grigoreta Cojocar (Babes-Bolyai University, Cluj-Napoca, Romania)

Teaching HCI as HCI to Undergraduate Computer Science Students from Romania
Adriana Guran and Grigoreta Cojocar (Babes-Bolyai University, Cluj-Napoca, Romania)

The Present Situation and the Prospect of Determining the Personality Type of Text Author with Machine Learning
Ninoslav Čerkez (VSITE, Croatia); Boris Vrdoljak (University of Zagreb & Faculty of Electrical Engineering and Computing, Croatia); Sandro Skansi (University of Zagreb, Croatia)

Thursday, September 19, 11:00-12:30 (PALMA II)

WICT/II: Workshop on Information and Communication Technologies II

Chair: Maja Stella (University of Split, Croatia)

Energy Efficient Routing Metric for RPL in IoT Networks
Sanchit Sood and Sonali Chouhan (Indian Institute of Technology Guwahati, India)

Methods of reduction of electromagnetic interference in design of printed circuit boards
Marin Perić and Maja Stella (University of Split, Croatia); Ivan Ivančević (Rimac Automobili, Croatia)

A Cloud Computing Solution to Teach Voice Over IP
Angelo Perkusich Michel Dias (IFPB - Instituto Federal de Educação, Ciência e Tecnologia da Paraíba, Brazil); Edson Almeida (IFPB, Brazil); Angelo Perkusich (Federal University of Campina Grande, Brazil)

Design and Simulation of High Gain 2x1 and 4x1 Microstrip Patch Array Antenna for Future 5G Applications
Souhir Faleh and Jamel Bel Hadj Tahar (National Engineers School Of Sousse, Tunisia)

Problems and Solutions for Operating OpenPGP Keyservers under the GDPR
Tobias Mueller, Florian Wittner and Hannes Federrath (Uni Hamburg, Germany)

Friday, September 20, 14:30 – 16:00 (PALMA I)

P2: POSTER / DEMO PROFESSIONAL SESSION

Chair: Matko Sarić (University of Split, Croatia)

Improving understanding of deep learning models for image classification through visual analytics
Ante Dražić, Ana Kuzmanić Skelin and Mirjana Bonkovic (University of Split, Croatia)

TIMETABLE A: TECHNICAL PROGRAM

Hotel Radisson Blu, Split, Thursday, September 19			
Time/Hall	**OLEANDAR**	**RUŽMARIN**	**PALMA I**
08:00	REGISTRATION*		
09:00–10:30	S1: Network Softwarization	S4/I: Signal Processing and Coding I	SYM 3/I: Symposium on Environmental Electromagnetic Compatibility (EEMC) I
10:30–11:00	**Coffee Break**		
11:00–12:30	S2: Data Analytics	S4/II: Signal Processing and Coding II	S7: Optical Communications
12:30–14:00	**Lunch**		
14:00-14:30	**Invited Talk (OLEANDAR):** **Darko Zibar (Technical University of Denmark, Denmark),** *Machine Learning Techniques for Next-generation Optical Communication Systems*		
14:30–16:00	S3: Machine Learning Applications	S5: 5G Technologies	S8: Software Development Methods
16:00–16:30	**Coffee Break**		

Hotel Radisson Blu, Split, Friday, September 20			
Time/Hall	**OLEANDAR**	**RUŽMARIN**	**PALMA I**
09:00–10:30	SS1: Special Session on Ad Hoc&Sensor Networks and IoT	SS3: Special Session on QoS in Wired and Wireless Networks	Round Table Croatian Qualification Framework
10:30–11:00	**Coffee Break**		
11:00–12:30	**OPENING CEREMONY (GRAND BALLROOM)**		
	Keynote Speech: **Szabolcs Malomsoky (Head of Ericsson Research Budapest, Hungary),** **Evolving 5G for the next decade**		
12:30–14:30	**Conference Luncheon**		
14:30–16:00	SS2: Special Session on Smart Environments and IoT	S6: Wireless Communications	SS5: Special Session on Robotic and ICT Assisted Wellbeing
16:00–16:30	**Coffee Break**		
16:30–18:00	SYM 3/II: Symposium on Environmental Electromagnetic Compatibility (EEMC) II	Business Forum Presentation – GREENMIND Project	Business Forum Presentation
18:15	**Bus Transfer to Port of Split**		
18:30-19:30	**Guided Tour in Split**		
19:30- 21:00	**Welcome Party in Split**		

Hotel Radisson Blu, Split, Saturday, September 21			
Time/Hall	**OLEANDAR**	**RUŽMARIN**	**PALMA I**
08:30–10:00	SS4: Special Session on Advanced Educational Technologies	SYM2/I: Symposium on Security and Digital Forensics I	SYM1/I: Symposium on Green Networking and Computing I
10:00–10:30	**Coffee Break**		
10:30–11:00	**Invited Talk:** **Ray Perez (Office of Naval Research, USA);** AI Based Tutors: Past, Present, and Future	SYM2/II: Symposium on Security and Digital Forensics II	SYM1/II: Symposium on Green Networking and Computing II
11:00–12:00	Workshop on Advanced Educational Technologies		
12:00–13:30	**Lunch**		
13:30–17:30	**Conference Trip**		

* Registration: Thursday (08:00 – 16:00), Friday (08:00 – 11:00), (14:30 – 17:00), Saturday (08:00 – 10:30)

TIMETABLE B: WORKSHOPS, TUTORIALS, BUSINESS FORUM

Hotel Radisson Blu, Split, Thursday, September 19			
Time/Hall	**PALMA II**	**KAKTUS**	**AGAVA**
09:00–10:30	WIICT/I: Workshop on ICT I	Keynote talk SCAVENGE Workshop	Business Forum Presentation
10:30–11:00	**Coffee Break**		
11:00 – 12:30	WIICT/II: Workshop on ICT II	SCAVENGE Workshop selected topics	Business Forum Presentation – MRS Electronic
12:30–14:00	**Lunch**		
14:00-14:30	**Invited Talk (OLEANDAR):** **Darko Zibar (Technical University of Denmark, Denmark),** *Machine Learning Techniques for Next-generation Optical Communication Systems*		
14:30–16:00	Presentation of the book: D. Poljak, M. Cvetković, Human Interaction with Electromagnetic Fields Tutorial T4 (D. Poljak and M. Cvetković) *Human Exposure to Electromagnetic Fields*	SCAVENGE Workshop Contest * SCAVENGE Project Meeting (16:30-18:00)	
16:00–16:30	**Coffee Break**		

Hotel Radisson Blu, Split, Friday, September 20			
Time/Hall	**PALMA II**	**KAKTUS**	**AGAVA**
09:00–10:30	Business Forum Presentation - NOKIA	Tutorial T3 (J. Haueisen) *New Recording and Data Analysis Techniques for Electroencephalography*	Business Forum Presentation - IBM R&D center
10:30–11:00	**Coffee Break**		
11:00–12:30	**OPENING CEREMONY (GRAND BALLROOM)**		
	Keynote Speech: **Szabolcs Malomsoky (Head of Ericsson Research Budapest, Hungary),** **Evolving 5G for the next decade**		
12:30–14:30	**Conference Luncheon**		
14:30-16:00	Tutorial T5 (L. Pajewski) *Ground Penetrating Radar: Technology, Methodology, Applications, and Research perspectives*	Tutorial T1 (P. Lorenz) *Advanced Architectures for Next Generation Wireless Networks*	PHD FORUM
16:00–16:30	**Coffee Break**		
16:30–18:00	Tutorial T2 (L. Periša) *Tensor Decompositions in Julia with Application to Computer Vision*	Workshop on Integrated Anti-Fraud System	Business Forum Presentation
18:15	**Bus Transfer to Port of Split**		
18:30-19:30	**Guided Tour in Split**		
19:30- 21:00	**Welcome Party in Split**		

Hotel Radisson Blu, Split, Saturday, September 21		
Time/Hall	**PALMA II**	**KAKTUS**
08:30–10:00	8th Workshop on Software Engineering in Practice	WESC: Ericsson Summer Camp 2019 Workshop
10:00–10:30	**Coffee Break**	
10:30–12:00	SYM4: Symposium on Information Security and Intellectual Property (ISIP) Invited talk: Ivan Vukušić	SoftCOM 2019 Innovations Challenge
12:00–13:30	**Lunch**	
13:30–17:30	**Conference Trip**	

SCAVENGE WORKSHOP PROGRAM

September 19, 2019

- 09:00 – 10:30: **Keynote Talk** [chair: Dr. Paolo Dini]
  - ***Toward Greener Network Operation*** – prof. Michela Meo (Politecnico di Torino)
- *10:30 – 11:00 coffee break*
- 11:00 – 12:30: **SCAVENGE selected topics** [chair: Dr. Paolo Dini]
  - ***Energy-aware Network Control*** – Dagnachew Temesgene (ESR04) / Nicola Piovesan (ESR05)
  - ***Mobile Traffic Characterization from the Physical Control Channel using Deep Learning Techniques*** – Hoang Duy Trinh (ESR03) / Angel Fernandez Gambin (ESR06)
  - ***Average Age of Information with Multiple Heterogeneous Information Sources*** – Elvina Gindullina (ESR07)
- 14:30 – 16:00: **SCAVENGE Contest** [chair: Dr. Paolo Dini]
  - Mobile data challenge for discovering latent patterns within mobile data based on state-of-the-art machine learning algorithms
  - Presentation of mobile data challenge results and winners:
    - ***Analysis of LTE PDCCH Traces for MCS Prediction and Mobility Pattern Analysis*** – Ramon Maria Garcia Alarcia, Pau Batlle Franch, Antoni Josep Eritja Olivella (Universitat Politecnica de Catalunya)
    - ***User Classification and MCS Prediction with LSTM Neural Networks from LTE Traffic Data*** – Giovanni Perin, Gianluca Fighera , Yuri Nalesso (Università di Padova)
- 16:30 – 18:00: **SCAVENGE PROJECT MEETING**

September 20, 2019

- 14:30 – 16:00: **SCAVENGE Poster Session** (ESRs) [chair: Dr. Marco Miozzo]

September 19, 2019, 09:00 – 10:30 (KAKTUS)

SCAVENGE WORKSHOP KEYNOTE TALK: MICHELA MEO

Toward greener network operation

Michela Meo, PhD

Full professor, Politecnico di Torino, Italy

Summary:
In this talk, we discuss the motivations for introducing renewable energy sources (RES) as power supply for wireless cellular networks. The introduction of RES is, indeed, becoming the more and more attractive for a number of reasons. First, network sustainability is becoming a critical issue: the amount of traffic and the variety of communication services are expected to grow at a very fast pace and this pushes the growth of the networks and the deployment of new technologies. Second, energy costs are already a large portion of network operational expenditures and RES can be an effective way to reduce costs. Moreover, RES make it easier to bring cellular communications to areas of the world where the power grid is not reliable, or in emergency situations.
However, while there are several reasons for adopting RES as power supply of communication systems, the typical intermittent nature of these sources, the variability of the amount of generated energy and the difficulty of its prediction, raise some critical challenges. Energy and communication resources have to be jointly considered and specific strategies are needed for their management.
As a case study, we investigate the effectiveness of sleep modes combined with machine learning approaches for traffic forecast. The considered solution provides a versatile framework for the implementation of the desired trade-off between energy consumption and QoS that naturally adapts the network operation to the traffic characteristics typical of each area.

Biography: *Michela Meo is a full professor at Politecnico di Torino in Communication Engineering. She received the Laurea degree in Electronic Engineering in 1993, and the Ph.D. degree in Electronic and Telecommunications Engineering in 1997, both from the Politecnico di Torino, Italy. Her research interests include sustainable networking, energy-efficient mobile networks and data centers, Internet traffic classification and characterization. She co-authored about 200 papers, 80 of which on international journals. She edited a book with Wiley on Green Communications and several special issues of international journals, including ACM Monet, Performance Evaluation, and Elsevier Computer Networks. She chairs the International Advisory Council of the International Teletraffic Conference and was chair of the Steering Committee of IEEE Online GreenComm. She was associate editor of ACM/IEEE Transactions*

of Networking and Green Series of the IEEE Journal on Selected Areas of Communications, and she is area editor of IEEE Transactions on Green Communications and Networking and associate editor of IEEE Communication Surveys and Tutorials. In the role of general or technical chair, she has lead the organization of several conferences, including ITC, Infocom Miniconference, ICC simposia, ISCC. She was Deputy Rector of Politecnico di Torino from March 2017 to March 2018. She was Member of the PhD Evaluation Committees in about 10 different institutions.

Friday, September 20, 14:30 - 16:00 (ADRIATIC)

SCAVENGE Workshop Poster Session

Chair: Marco Miozzo (CTTC/CERCA, Spain)

Energy Management Towards Sustainable Mobile Networks
Angel Fernandez Gambin (University of Padova, Italy)

Energy efficiency through frame and chip level optimization in IoT networks
Ioana Suciu (Polytechnic University of Catalonia & Worldsensing, Spain); Xavier Vilajosana (Universitat Oberta de Catalunya, Spain); Kris Pister (University of California, Berkeley, USA); Andrea Bartoli (Worldsensing, Spain)

Classification of Mobile Services and Apps through Physical Channel Fingerprinting using Machine Learning
Hoang Duy Trinh (Centre Tecnològic de Telecomunicacions de Catalunya, Spain); Lorenza Giupponi and Paolo Dini (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain)

Dynamic Control of Functional Splits in Energy Harvesting Virtual Small Cells
Dagnachew Azene Temesgene (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Marco Miozzo (CTTC/CERCA, Spain); Paolo Dini (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain)

Network resource allocation policies with energy transfer capabilities
Nicola Piovesan (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Marco Miozzo (CTTC/CERCA, Spain); Paolo Dini (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain)

Applications of Coding Theory to Caching, Storage and Computation on the Wireless Edge
Nitish Mital, Cong Ling and Deniz Gündüz (Imperial College London, United Kingdom (Great Britain))

Design and Implementation of Renewably-Powered Base-Stations with Heterogeneous Access Channels
Vianney Anis and Stephan Weiss (University of Strathclyde, United Kingdom (Great Britain))

Core Network Management Procedures for Self-Organized and Sustainable 5G Cellular Networks
Thembelihle Dlamini (University of Padova, Italy)

Classification of Modulation Schemes in Environments with Interference
Pavlos Triantaris (Toshiba Research Europe Ltd., United Kingdom (Great Britain)); Evgeny Tsimbalo (Telecommunications Research Laboratory of Toshiba Research Europe Ltd., United Kingdom (Great Britain)); Woon Hau Chin (Toshiba Research Europe Limited, United Kingdom (Great Britain)); Deniz Gündüz (Imperial College London, United Kingdom (Great Britain))

Reducing Backhaul Traffic with Coded Storage and Delivery
Mehmet Emre Ozfatura and Deniz Gündüz (Imperial College London, United Kingdom (Great Britain))

Delay-Optimal Resource Scheduling and Computation Offloading for Energy Harvesting Devices
Ibrahim Fawaz (CEA LIST, France); Mireille Sarkiss (Telecom SudParis, France); Philippe Ciblat (Telecom ParisTech & Institut Polytechnique de Paris, France)

Distributed sensing from energy harvesting wireless devices
Elvina Gindullina (University of Padova, Italy); Leonardo Badia (Università degli Studi di Padova, Italy)

Providing and Optimizing Security and Energy for D2D communications in 5G
Filipe Conceição (Telecom SudParis & CEA Saclay, France); Nouha Oualha (CEA, LIST, France); Djamal Zeghlache (Institut Mines-Telecom, Telecom SudParis & UMR 5157 CNRS - Samovar, France)

Saturday, September 21, 10:30 - 12:00 (PALMA II)

SYM4: SYMPOSIUM ON INFORMATION SECURITY AND INTELLECTUAL PROPERTY (ISIP)

ISIP INVITED TALK: IVAN VUKUŠIĆ

Criminal Protection of Intellectuall Property

Ivan Vukušić, PhD

Assistent Professor, University of Split Faculty of Law, Croatia

Summary:
The serious and organised crime landscape in the world has changed drastically in the past years – in large part due to advancements in technology. Criminals quickly adopt and integrate new technologies into their modi operandi or build brand-new business models around them. The use of new technologies by organised crime groups (OCGs) has an impact on criminal activities across the spectrum of serious and organised crime. This includes developments online, such as the expansion of online trade and widespread availability of encrypted communication channels, as well as other aspects of technological innovation such as more accessible and cheaper drone technology, and advanced printing technologies. Technology has become a key component of most, if not all, criminal activities carried out by OCGs and individuals in the world and has afforded organised crime with an unprecedented degree of flexibility. Criminals make use of all and every communication channel available. For example, email can be used for phishing campaigns or to distribute malware, and social media can be used to find and groom victims. Author will give perspective of protection of intellectuall property in Criminal Code of Croatia. Answer on question who can be perpetrator, what form of guilt needs to be satisfied and analyse possible novelties in criminal sanctions for criminal offences against intellectual property.

Biography: *Ivan Vukušić was born in 1985. He graduated at the Split Faculty of Law in 2007. On 1 March 2008. began working at Faculty of Law in Split as junior researcher, employed on the scientific project: "Jerolim Micelovic – Michieli – Great Croatian penologist" and now is on project "European characteristics and problems of the Croatian system of executing the punishment of deprivation of liberty". From 2008. to 2009. volunteered as judicial trainee at Split County Court an passed Bar exam in 2011.*
From 1st February to 1st March 2009 she was on student residence at Faculty of Law, Free University in Berlin, Germany within the Tempus project JEP-41011-2006. He visited Freiburg at Max Planck Institute for Foreign and International Criminal law, UNODC seminars in Doha and Tirana on topic of organized crime and corruption, Law faculty in Hagen and presented his papers on national and international conferences. At this time, he is Assistent Professor at Faculty of Law Split, Croatia.

SYM4: Symposium on Information Security and Intellectual Property (ISIP)

Co-Chairs: Marija Boban (University of Split, Croatia) and Gordan Ježić (University of Zagreb, Croatia)

The Right to Erasure - „Right to be Forgotten"
Dinka Šago (University of Split & Faculty of law, Croatia)

The impact of ICT innovations on Customer Relationship Management (CRM)
Vlatka Ružić and Branislav Šutić (Polytechnics Nikola Tesla u Gospić, Croatia)

Issues in proving criminal offenses of violence against children trough information and communication technologies in Bosnia and Herzegovina
Ivana Stipanovic (University of Mostar & Faculty of Law, Bosnia and Herzegovina)

Information security and the protection of children's personal data
Marija Boban (University of Split Faculty of Law, Croatia)

Friday, September 20, 14:30 - 16:00 (AGAVA)

PhD FORUM

The PhD Forum provides an opportunity for doctoral students to present their work related to the SoftCOM 2019 conference topics to a wider community of researchers from academia and industry. The forum aims to encourage interaction and networking among doctoral students, as well as with the audience.
The PhD Forum has been organized as a poster session, preceded by a fast-paced introduction by each student that offers a preview of the posters. Each student has a strictly-timed 2-minutes' slot to present a "pitch talk" about her/his research. The purpose of the pitch talk is to provide a brief outline of one's doctoral research work, with the goal to raise awareness and generate further discussion over the poster session and coffee break that follow.

Steering committee:

Dinko Begušić, University of Split
Tihana Galinac Grbac, University of Rijeka
Darko Huljenić, Ericsson Nikola Tesla
Maja Matijašević, University of Zagreb
Drago Žagar, Josip Juraj Strossmayer University of Osijek

Program & Organizing Committee:

Maja Škiljo, University of Split, Chair
Andrej Grgurić, Ericsson Nikola Tesla
Višnja Križanović, Josip Juraj Strossmayer University of Osijek
Goran Mauša, University of Rijeka
Mirko Sužnjević, University of Zagreb

The Wheel Spinning behavior in Intelligent Tutoring Systems: An overview of the approaches
Ines Šarić-Grgić (University of Split, Faculty of Science & University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Croatia); Ani Grubisic (University of Split, Faculty of Science, Croatia)

Cochleagram-based approach for emotion variation detection
Luka Kraljević and Mladen Russo (University of Split, Croatia)

Lane Detection problem in Automotive Applications
Denis Vajak (Faculty of Electrical Engineering, Comp. Science and Information Tech Osijek, Croatia); Mario Vranjes (University of Osijek, Faculty of Electrical Engineering, Computer Science and Information Technology, Croatia); Ratko Grbić (University of Osijek, Faculty of Electrical Enginneering, Croatia)

Heart Chamber Localization and Segmentation Based on Deep Learning Methods
Filip Novoselnik (Faculty of Electrical Engineering, Computer Science and Information Technology Osijek, Croatia); Irena Galić (Faculty of Electrical Engineering, Computer Science and Inf. Technology Osijek, Croatia)

Location-Aware Scheduling of IoT Services in Fog Computing
Petar Krivic (University of Zagreb Faculty of Electrical Engineering and Computing, Croatia); Mario Kusek (University of Zagreb, Croatia)

The Implications of End-user Service Usage Behavior Patterns on In-network Video QoE Monitoring and Management
Ivan Bartolec and Lea Skorin-Kapov (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)

QoE Assessment for Interactive Immersive AR/VR Applications
Sara Vlahovic and Lea Skorin-Kapov (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)

Overview of Big Data Optimizations in Internet of Things using Data Analytics
Jelena Čulić Gambiroža (Ericsson Nikola Tesla, Croatia); Mario Cagalj (University of Split, FESB, Croatia); Toni Mastelic (Ericsson Nikola Tesla, Croatia)

Tangible User Interfaces and Programming for Young Children
Lea Dujić Rodić (FESB, University of Split, Croatia); Andrina Granić (Prirodoslovno-matematički Fakultet u Splitu, Croatia)

TUTORIALS

TUTORIAL T1 Friday, September 20

14:30-16:00 (KAKTUS)

Pascal Lorenz, PhD

University of Haute Alsace, France

Advanced Architectures for Next Generation Wireless Networks

Abstract: Emerging Internet Quality of Service (QoS) mechanisms are expected to enable wide spread use of real time services such as VoIP and videoconferencing. The "best effort" Internet delivery cannot be used for the new multimedia applications. New technologies and new standards are necessary to offer Quality of Service (QoS) for these multimedia applications. Therefore new communication architectures integrate mechanisms allowing guaranteed QoS services as well as high rate communications. The service level agreement with a mobile Internet user is hard to satisfy, since there may not be enough resources available in some parts of the network the mobile user is moving into. The emerging Internet QoS architectures, differentiated services and integrated services, do not consider user mobility. QoS mechanisms enforce a differentiated sharing of bandwidth among services and users. Thus, there must be mechanisms available to identify traffic flows with different QoS parameters, and to make it possible to charge the users based on requested quality. The integration of fixed and mobile wireless access into IP networks presents a cost effective and efficient way to provide seamless end-to-end connectivity and ubiquitous access in a market where the demand for mobile Internet services has grown rapidly and predicted to generate billions of dollars in revenue. This tutorial covers to the issues of QoS provisioning in heterogeneous networks and Internet access over future 5G wireless networks. It discusses the characteristics of the Internet, mobility and QoS provisioning in wireless, IoT and mobile IP networks. This tutorial also covers routing, security, baseline architecture of the inter-networking protocols and end to end traffic management issues.

Biography: *Pascal Lorenz received his M.Sc. (1990) and Ph.D. (1994) from the University of Nancy, France. Between 1990 and 1995 he was a research engineer at WorldFIP Europe and at Alcatel-Alsthom. He is a professor at the University of Haute-Alsace, France, since 1995. His research interests include QoS, wireless networks and high-speed networks. He is the author/co-author of 3 books, 3 patents and 200 international publications in refereed journals and conferences.*

He was Technical Editor of the IEEE Communications Magazine Editorial Board (2000-2006), IEEE Networks Magazine since 2015, IEEE Transactions on Vehicular Technology since 2017, Chair of IEEE ComSoc France (2014-2018), Financial chair of IEEE France (2017-2019), Chair of Vertical Issues in Communication Systems Technical Committee Cluster (2008-2009), Chair of the Communications Systems Integration and Modeling Technical Committee (2003-2009), Chair of the Communications Software Technical Committee (2008-2010) and Chair of the Technical Committee on Information Infrastructure and Networking (2016-2017). He has served as Co-Program Chair of IEEE WCNC'2012 and ICC'2004, Executive Vice-Chair of ICC'2017, TPC Vice Chair of Globecom'2018, Panel sessions co-chair for Globecom'16, tutorial chair of VTC'2013 Spring and WCNC'2010, track chair of PIMRC'2012 and WCNC'2014, symposium Co-Chair at Globecom 2007-2011, ICC 2008-2010, ICC'2014 and '2016. He has served as Co-Guest Editor for special issues of IEEE Communications Magazine, Networks Magazine, Wireless Communications Magazine, Telecommunications Systems and LNCS. He is associate Editor for International Journal of Communication Systems (IJCS-Wiley), Journal on Security and Communication Networks (SCN-Wiley) and International Journal of Business Data Communications and Networking, Journal of Network and Computer Applications (JNCA-Elsevier).

He is senior member of the IEEE, IARIA fellow and member of many international program committees. He has organized many conferences, chaired several technical sessions and gave tutorials at major international conferences. He was IEEE ComSoc Distinguished Lecturer Tour during 2013-2014.

TUTORIAL T2

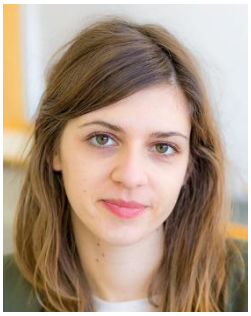
Friday, September 20
16:30-18:00 (PALMA II)

Lana Periša, PhD

University of Split, Croatia

Tensor Decompositions in Julia with Application to Computer Vision

Abstract: Julia programming language is a free flexible dynamic language, appropriate for scientific and numerical computing, with performance comparable to traditional statically-typed languages.
In this tutorial we will cover the basics of Julia, learn how to work with n-dimensional arrays, i.e. tensors, using the TensorToolbox package, and use JuliaImages package to work with images. Tensors have shown to be useful in many applications of machine learning, since they preserve the structure of the data, and decompositions such as CP and Tucker decompositions are widely used for data analysis and dimensionality reduction. We will focus on tensor decompositions suitable for computer vision problems, such as face recognition and shadow reduction, and use Julia to provide solutions.



Biography: *Lana Periša received her PhD in Mathematics in 2017 from the Faculty of Science, University of Zagreb, and is currently working as a postdoctoral researcher at the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, University of Split. Her research interest include numerical linear algebra, tensor decompositions and tensor networks algorithms, with applications in computer science and quantum physics. She did a PostDoc from 2018 to 2019 at the École polytechnique fédérale de Lausanne in Switzerland in the group Numerical algorithms and high-performance computing and was a visiting scientist at the Lawrence Berkeley National Laboratory in California in 2018 in the Scalable Solvers Group. She has been working with programming language Julia since its beginnings and has developed the TensorToolbox package, a registered Julia package for tensor computations.*

TUTORIAL T3

Friday, September 20
09:00-10:30 (KAKTUS)

Jens Haueisen, PhD

Technische Universität Ilmenau, Germany

New Recording and Data Analysis Techniques for Electroencephalography

Abstract: Multichannel Electroencephalography (EEG) is widely used in clinical neurology and neuroscientific research. Recording of EEG is currently performed in specialized labs using a time consuming and error prone procedure with wet electrodes. Evaluation of EEG recordings requires elaborate work from trained specialists and is challenging because of the large amount of data including the data's many dimensions and because of the high noise levels. Concurrently, there is a growing interest in online EEG data processing for brain-computer-interfaces and neurofeedback applications. Consequently, new approaches for EEG recording and data analysis are required. In this talk, I will present two new approaches for EEG recording and data analysis. First, recent advances in dry high density EEG recording techniques will be reviewed. Challenges and benefits of dry high density EEG will be demonstrated on a novel 256-channel EEG cap with dry electrodes. In a proof of principle study the novel 256-channel dry EEG cap is compared to a conventional 256-channel wet EEG cap using a previously established validation paradigms. Our results demonstrate that resting state EEG, eye movements, alpha activity, and pattern reversal visual evoked potentials can be recorded with the 256-channel EEG cap with dry electrodes with short preparation time and without significant differences to recordings with a conventional cap based on wet electrodes. This new technology will enable new fields of application like brain-computer-interfaces and mobile EEG acquisition. Second, the open source MNE-CPP project will be discussed, which offers a framework to develop offline as well as online data analysis and processing software for Electroencephalography and Magnetoencephalography (MEG). MNE-CPP supports online data acquisition for EEG (e.g. eegosports) and MEG systems (e.g. Elekta Neuromag Vectorview). MNE-CPP is structured into libraries, which guarantee a modular and easily extendable architecture. MNE-CPP hosts libraries to support various data formats such as the widely used Fiff and FreeSurfer formats. It keeps the external dependencies to a minimum, namely Qt5 and Eigen. We implemented a brain-computer-interfaces based on steady-state-visual-evoked-potentials for an online spelling application. With this paradigm, we successfully tested the acquisition and online processing of EEG data, recorded with newly supported eegosports amplifiers and a dry electrode cap setup.

Biography: *Jens Haueisen received a M.S. and a Ph.D. in electrical engineering from Technische Universität, Germany, in 1992 and 1996, respectively. From 1996 to 1998 he worked as a Post-Doc and from 1998 to 2005 as the head of the Biomagnetic Center, Friedrich-Schiller-University, Jena, Germany. In 2003 he received the habilitation (professorial thesis). Since 2005 he is Professor of Biomedical Engineering and directs the Institute of Biomedical Engineering and Informatics at Technische Universität Ilmenau, Germany. He has authored and co-authored more than 200 research articles in peer reviewed scientific journals and serves on two editorial boards. From 2002 to 2004 he served as President and from 2004 to 2006 as Secretary General of the International Advisory Board on Biomagnetism. Since 2005, he is chair of the study program development commission and chair of the examination commission of the Bachelor and Master program "Biomedical Engineering". He is member of the academic senate of Technische Universität Ilmenau and full member of the Saxon Academy of Science. Since 2019, he is chairman of the board of the German Society for Biomedical Engineering and member of the board of VDE. His research interests include the investigation of active and passive bioelectric and biomagnetic phenomena and medical technology for ophthalmology.*

TUTORIAL T4 Thursday, September 19
14:30-16:00 (PALMA II)

Dragan Poljak and Mario Cvetković, PhD
University of Split, FESB Split, Croatia

Human Exposure to Electromagnetic Fields

Abstract: This Tutorial, mostly based on the forthcoming book: Human Interaction with Electromagnetic Fields – Computational Models in Dosimetry, by Poljak and Cvetković, aims to review various aspects of human interaction with non-ionizing part of electromagnetic spectrum including both the undesired exposure from artificial sources and the biomedical applications of electromagnetic fields. The tutorial covers basic aspectsof environmental electromagnetic fields, coupling mechanisms between humans and static electric, static magnetic, and time-varying fields, established biological effects of electromagnetic fields from static to high-frequency range, international safety guidelines related to limiting human exposure to those fields, including relevant exposure limits and safety measures, electromagnetic-thermal dosimetry models and the related analytical/numerical solution methods. First, some theoretical and experimental methods of incident field dosimetry for the assessment of external fields due to low frequency (LF) and high frequency (HF) sources are presented and accompanied with a number of examples deals with power lines, transformer substations, PLC systems, RFID antennas and radio base stations. Furthermore, some electromagnetic-thermal dosimetry methods for the assessment of human exposure to low frequency (LF), high frequency (HF) and transient electromagnetic radiation are given. In particular, the use of integral/differential equation formulations and related numerical solution procedures (primarily based on the use of Boundary Element Method – BEM, and Finite Element method – FEM) for the calculation of induced current densities, internal fields and specific absorption rate (SAR) are discussd in detail. For HF exposures the related temperature increase in tissues is dominant effect and is therefore carried out. Computational examples pertaining to various realistic exposure scenarios, such as; pregnant woman/foetus exposed to low frequency (LF) fields, the human eye, the human brain and the human head exposed to HF electromagnetic fields will be given. Illustrative examples of thermal dosimetry stemming from the brain, eye and head exposed to HF fields are shown, as well. The obtained numerical results for induced current densities, internal fields and SAR are compared against exposure limits proposed by ICNIRP (International Commission on Non Ionizing Radiation Protection). This is followed by some examples of biomedical applications of electromagnetic fields, including the transcranial magnetic stimulation (TMS), transcranial electrical stimulation (TES), but also some electrotherapy and magnetotherapy techniques. Also, some illustrative numerical examples related to thermal modeling of various ophthalmological procedures will be given. Finally, the last part of the Tutorial deals with an application of stochastic collocation (SC) for stochastic modeling (combined with deterministic approaches) of bioelectromagnetic phenomena.

Biography: *was born on 10 October 1965. He received his BSc in 1990, his MSc in 1994 and PhD in electrical engineering in 1996 from the University of Split, Croatia. He is the Full Professor at Department of Electronics, Faculty of electrical engineering, mechanical engineering and naval architecture at the University of Split, and he is also Adjunct Professor at Wessex Institute of Technology. His research interests include frequency and time domain computational methods in electromagnetics, particularly in the numerical modelling of wire antenna structures, and numerical modelling applied to environmental aspects of electromagnetic fields. To date Professor Poljak has published nearly 200 journal and conference papers in the area of computational electromagnetics, seven authored books and one edited book, by WIT Press, Southampton-Boston, and one book by Wiley, New Jersey. Professor Poljak is a member of IEEE, a member of the Editorial Board of the journal Engineering Analysis with Boundary Elements, and co-chairman of many WIT International Conferences. He is also editor of the WIT Press Series Advances in Electrical Engineering and Electromagnetics. He was awarded by several prizes for his carrier achievements, such as National Prize for Science (2004), Croatian section of IEEE annual Award (2016). In 2011 professor Poljak became a member of WIT Board of Directors. From 2011 to 2015 he was the Vice-dean for research at the Faculty of electrical engineering, mechanical engineering and naval architecture. In June 2013 professor Poljak became a member of the board of the Croatian Science Foundation. He is currently involved in one COST project, ITER physics EUROfusion collaboration and one national center for excellence in research for technical sciences. He served a co-chair of Working Group 2 of IEEE/International Committee on Electromagnetic Safety (ICES) Technical Committee 95 SC6 EMF Dosimetry Modeling.*

Mario Cvetković received his BSc in electrical engineering from the University of Split, Croatia in 2005. In 2009 he obtained MPhil degree from the Wessex Institute of Technology, University of Wales, UK. In December 2013 he received PhD from University of Split, Croatia. He is assistant professor at the Faculty of electrical engineering, mechanical engineering and naval architecture (FESB), University of Split were he teaches fundamentals of electrical engineering course. In 2010, he held a seminar to graduate and postgraduate students at the Technical University of Ilmenau, Germany, and in 2014 and 2018 he held seminars to PhD students on the numerical methods in engineering at the Malardalen University, Vasteras, Sweden. He is a recipient of the "Best Student Paper Award", awarded at the 16th edition of the international conference SoftCOM 2008. At the Scientific Novices Seminar held in 2012, he was awarded with the recognition for his previous scientific achievements. To date he has published more than 50 journal and conference papers and several book chapters (including those for CRC Press and Springer). He is a member of the IEEE/International Committee on Electromagnetic Safety (ICES) Technical Committee 95 SC6 EMF Dosimetry Modeling.

TUTORIAL T5

Friday, September 20
14:30-16:00 (PALMA II)

Lara Pajewski, PhD
Sapienza University of Rome, Italy

Ground Penetrating Radar: Technology, Methodology, Applications, and Research perspectives

Abstract: Ground Penetrating Radar (GPR) is a safe, advanced, reliable, non-invasive and non-destructive testing technique that can be effectively used for inspecting the subsurface as well as the internal structure of natural and man-made objects. During GPR surveys, a source sends ultra-wideband electromagnetic signals into the ground or object under test. At the boundaries where the electromagnetic properties of media change, the electromagnetic waves undergo transmission, reflection, refraction, and scattering. The radar sensors measure the amplitudes and travel times of the signals returning to the surface, which can be analyzed and interpreted to estimate the geometric and physical properties of the monitored subsurface or target. To obtain the best results, GPR has to be used by qualified personnel, familiar with both the physical principles of the method and its limitations. The interpretation of experimental data is not straightforward and shall be carried out consciously and carefully, taking into account and combining relevant information of above ground and subsurface features.
GPR started being used in the field of geosciences in the 1950s and rapidly found applications in several other areas including archaeology and cultural heritage preservation, civil and environmental engineering, agriculture and management of water resources, humanitarian mine clearance, forensics and security, localization of people trapped under debris or avalanches based on the detection of their vital signs, planetary exploration, and more. In the last decades, new developments have occurred at an increasing pace and, although the technique has now reached a level of maturity, there still are vast opportunities for further advancements and innovation.
The tutorial will cover the following topics:
1. GPR fundamentals
2. GPR technology
– Radar systems and antennas
– Equipment testing and calibration procedures
3. GPR methodology
– Survey planning and data acquisition strategies
– Methods and tools for advanced data analysis and interpretation
4. Applications and examples
Parallel to the presentation of the various subjects, information will be provided about available open resources (free software, collections of experimental data, educational material) and cutting-edge studies currently carried out by the GPR scientific community. Moreover, ideas will be given for possible research activities that could be undertaken by interested Attendees.

Biography: *Lara Pajewski received the Laurea degree in Electronic Engineering cum laude from Roma Tre University of Rome, Italy, and the PhD in Applied Electromagnetics and Electrophysics Sciences from Sapienza University of Rome, Italy. Since November 2016, she is a Professor of Electromagnetic Fields in Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications. From April 2013 to October 2017 she was the Chair, Grant Holder Scientific Representative and Administrator of COST Action TU1208 "Civil Engineering Applications of Ground Penetrating Radar," a scientific network involving more than three hundreds experts from academia and industry, from 41 Countries. From September 2017 she is the President of TU1208 GPR Association, a non-profit international network on Ground Penetrating Radar founded as a follow-up initiative of COST Action TU1208. Moreover, from September 2017 she is the Editor-in-Chief of Ground Penetrating Radar, the first peer-reviewed scientific journal dedicated to GPR. As of April 2019, Lara Pajewski is also the President of the Geosciences Instrumentation and Data Systems Division of the European Geosciences Union (EGU). Her main research interests are in GPR technology, methodology and applications, integration of GPR with complementary non-destructive testing methods, full-wave electromagnetic modelling of complex scenarios, electromagnetic pollution and radiation protection, and science management. At Sapienza University, she currently holds the "Antennas" course for the Laurea in Information Engineering (Bachelor's Degree) and the "Ground Penetrating Radar" course for the Laurea Magistrale in Electronic Engineering (Master Degree). More information on Lara Pajewski is available here:*
http://gpradar.eu/about/larapajewski.html

BUSINESS FORUM

Saturday, September 21, 10:30-12:00 (KAKTUS)

iPANEL: SoftCOM 2019 Innovation Challenge

"I believe in innovation and that the way you get innovation
is you fund research and you learn the basic facts."

— Bill Gates

The basis of every innovation is a deep understanding of a problem domain, differentiation between customer needs and wants, and finally knowledge in the solution space. Rapid advances in ICT in last few decades expand the solution space and its application to almost any problem domain. However, packaging those solutions to a product or a service that will fulfil customer needs is still a challenge faced by numerous startups. That said, having a solution does not imply having a product as well.
With this innovation challenge, SoftCOM conference gives an opportunity to its authors to turn their solution from a scientific paper to an innovative idea and win a valuable prize. After their papers are accepted, authors will be informed how to participate in this challenge and submit their idea. Only several ideas will be selected and pushed to the finals, where the authors will have to present their ideas at this workshop in front of the panel of expert judges. Finally, winners will be rewarded with valuable prizes.

1st Place: GOLD iAward certificate – Wireless around-ear headphones
2nd Place: SILVER iAward certificate – External SSD USB 3.1
3rd Place: BRONZE iAward certificate – Wearable Activity Tracker

Panel of expert judges:

MODERATOR:

Marko Bervanakis, Ericsson Nikola Tesla d.d., Zagreb

Marko Bervanakis is Global New Business & Innovation Manager, Coach and Facilitator at Ericsson Nikola Tesla d.d. In the past he also worked in other Global Telecoms companies (both in Europe & in the Asia pacific region) as a technical trainer, educator, consultant, manager and innovation facilitator. Today, he also serves as a key team member in the organization and execution of Ericsson annual global Ericsson Innovation Awards challenge for University students. He has won several company Innovation awards and runs innovation workshops around the globe.

Friday, September 20, 16:30 – 18:00 (RUŽMARIN)

GREENMIND – Green and Smart mobility

The Green mind project fosters the development of economic COMPETITIVENESS and INNOVATION in the GREEN AND SMART MOBILITY industry by reinforcing regional and transnational cooperation between businesses, research bodies and authorities. Being active in a context of fast technological advancements and increasingly restrictive environmental policies, Green mind strengthens the transnational activities of clusters and agencies to support small and medium-sized enterprises (SMEs) in exploiting and identifying market opportunities and tapping the raising demand for green and smart mobility products and services in key mobility sectors such as transport and logistics, automotive, energy and IT..

Presenter: **Martin Bućan, SDC, Croatia**

Martin Bućan is experienced advisor in County of Split and Dalmatia, supporting Martin has been involved in various EU cross-border projects since the beginning of his career, has successfully implemented the first Big data analysis for the SDC area and worked on the establishment of a network of e-chargers in the County, as well as over rally e-vehicles in Dalmatia. He has been named a project manager for Master Transport Development Plan of Central Dalmatia and participates in new projects related to smart and green mobility.

Friday, September 20, 09:00 – 10:30 (PALMA II)

ZERO EMISSION - NOKIA'S TECHNOLOGY PORTFOLIO

We have seen that in today's world, power efficiency and green technologies are becoming more important in design of new technology products. Over the years, Nokia had invested a lot in optimizing power and building efficiency in whole ICT portfolio that started with radio equipment and spread in other infrastructure building blocks of ICT industry. Presentation will give insight on new Nokia's communication equipment products and incorporated solutions which contribute to reductions of greenhouse gas emissions and improve equipment energy-efficiency.

Presenter: Vedran Ivaniš, Nokia Networks, Croatia

Vedran Ivaniš is experienced Account Manager in Nokia Networks, supporting new and exciting cross technology solutions for Telecommunication Companies and Enterprises. Initially started as telecommunications expert in Sono and Siemens, but, in past fifteen years, managed to collect wide technology knowledge through innovative ICT Projects in Hewlett Packard, Huawei, Microsoft and Asseco. His current role in Nokia is focused on motivating customers to adopt Industry 4.0 and digital transformation projects built with the new technologies and products from Nokia.

Friday, September 20, 09:00 – 10:30 (AGAVA)

LINUX ENCRYPTION PERFORMANCE IS NOT AN EXCUSE ANYMORE

Data breaches pose a threat to almost every enterprise today and are definitely getting more attention than ever before. One of the most effective ways to keep your data safe is by encrypting it, whether in-flight, in-use, or at-rest. However, encrypting all data comes with additional costs to the IT infrastructure and many find it easier to avoid it. This presentation will provide an overview of recent performance improvements in different areas of the Linux cryptographic stack. Covering various architectures and vendors, Danijel will provide insights in how Linux performance did evolve recently, showcasing examples in both asymmetric (TLS handshakes) and symmetric (TLS data encryption, dm-crypt) cryptography. Finally, demystifying topics like TLSv1.3, Elliptic Curve cryptography, and hardware accelerated crypto support will inspire your data protection journey.

Presenter: Danijel Soldo, IBM R&D center, Boeblingen, Germany

Danijel Soldo is currently working as a performance analyst in the IBM R&D center in Boeblingen, Germany. His primary field of expertise is Linux cryptography performance analysis on the IBM Z platform. Danijel has a proven record of speaking at technical sessions on various events (Linux Customer Workshop Boeblingen, IBM TechU Istanbul, IBM TechU Hollywood, IBM TechU Atlanta, Open Source Summit NA 2019 San Diego).

Thursday, September 19, 11:00 – 12:30 (AGAVA)

MRS ELECTRONIC: A Trusted Partner for Intelligent Electronics

As an introduction, an overview of the company will be presented. The electronics industry is one of the most dynamic and innovative growth sectors in the world. Since the founding of the company in 1999, MRS Electronic has evolved from a simple manufacturer of relays and controls to a competent partner and expert in automotive and commercial vehicle electronics. Advanced developments and in-house assembly and production offer the customer tangible added value for individual projects.
The broad product portfolio consists of products in the area of controls, gateways, HMI systems and relays. In addition to a broad product portfolio, the company offers its services and expertise in the following areas: test systems, development and software. Products and services from the company can be found in many different industries: automotive, agricultural engineering, construction machinery, commercial vehicles, special vehicles, automation and customized solutions.
Getting everything from a single source is helping customers to achieve their goals faster and more economically. From the conception and development of the product to a series production to after-sale services, MRS Electronic provides innovative solutions and great quality. With the plan to continue expanding its development, services and products worldwide, the company is positioning itself as a global player.

Presenter: Nikola Morić, MRS Electronic d.o.o. Croatia

Nikola Morić graduated at the Faculty of Electrical Engineering, Mechanical Engineering, and Naval Architecture in Split in 2012. He started his professional career as a technical support engineer at CPK Automotive in 2013. He switched to MRS Electronic GmbH & Co. KG in 2016 where he worked as a test engineer on product validation and verification. Since the end of 2018 he is the Managing Director of MRS Electronic d.o.o.

Friday, September 20, 16:30 – 18:00 (KAKTUS)

WORKSHOP ON INTEGRATED ANTI-FRAUD SYSTEM

The research results of Integrated Anti-Fraud System (IAFS) project will be presented through a special workshop as a part of the SoftCOM 2019 conference. The IAFS project is a cooperation of university and ICT industry, namely the cooperation between University of Zagreb Faculty of Electrical Engineering and Computing and Multicom. This research has been supported under Competitiveness and Cohesion Operational Programme from the European Regional and Development Fund (project no. KK.01.2.1.01.0041). IAFS project focused on research and development of fraud detection methods over endless data streams in telecommunication and financial industries. Fraudulent activities are generating big financial losses in the industry today. For the telecommunication industry, Communications Fraud Control Association estimates global fraud loss in 2015 at 38.1 billion US dollars. In 2017, this loss is estimated slightly below 30 billion US dollars. Such numbers create an imperative for detecting and preventing fraudulent activities. Research on the project included semi-supervised methods for anomaly detection in data streams. The first part of the research activities focused on data object unsupervised classification methods, e.g., data stream clustering algorithms. Majority of data stream clustering algorithms work in two distinct phases, separating classification and model updating. A new statistical single-phase data stream clustering algorithm that unifies classification and model updating activities under the single phase was proposed and developed by the project research team. In the second part of the project, research activities switched to methods for detecting data object sequences in data streams, focusing mainly on the information theory, data compression, minimal description length (MDL) theory, and Kolmogorov complexity. In the compression theory context, special attention was given to finite state machines used in data compression and usage of automata to detect regularly occurring data object sequences in data streams. An extension of pushdown automata (PDA) was proposed to cover capturing and detection of multi-contextual data object sequences. Capturing frequency and statistics on transitions, the proposed automata is capable of detecting whether the classified data object sequence is occurring regularly or sparsely. To prevent automata overfitting and complexity explosion, additional methods for the proposed automata compression and transformation were developed. Future research in the area will focus on further advancement and testing of the proposed anomaly detection mechanism based on the single-phase data stream clustering algorithm combined with the extended pushdown automata.

Speaker and workshop facilitator: Boris Vrdoljak, University of Zagreb, Croatia

Boris Vrdoljak is full professor at the University of Zagreb, Faculty of Electrical Engineering and Computing. He received his Ph.D. degree from the same faculty in 2004. He spent 3 months as a visiting researcher at the University of Bologna, Italy, and 12 months as postdoctoral researcher at INRIA institute, France. His research interests cover ontology matching, e-business security, data warehousing, and big data analytics. He is manager of the Faculty of Electrical Engineering and Computing team in the project Integrated Anti-Fraud System (IAFS). Boris Vrdoljak is a member of the Centre of Research Excellence for Data Science and Advanced Cooperative Systems (ACROSS-DataScience), Data Streams Laboratory, and Laboratory for Information Security and Privacy. He is also president of the council of the postgraduate specialist study Information Security.

Saturday, September 21, 11:00 – 12:00 (OLEANDAR)

WORKSHOP ON ADVANCED EDUCATIONAL TECHNOLOGIES

Adaptive Courseware and Natural Language Tutor (AC&NL Tutor)

The research results of the Adaptive Courseware and Natural Language Tutor (AC&NL Tutor) project funded by the USA Office of Naval Research (ONR) Grant N00014-15-1-2789, will be presented through a workshop as a part of the SoftCOM 2019 conference. The AC&NL Tutor project is focused on research and development of a learning environment with adaptive courseware and communication based on controlled natural language that enables acquisition of conceptual knowledge in the learning, teaching and knowledge testing process. Communication in the AC&NL Tutor is based upon extracted knowledge from natural language text, which is taken as input. The extracted knowledge is presented through automatically generated sentences and questions as well as concept maps translated from an ontology. Undoubtedly, natural language processing is the driving force for many applications, including intelligent tutoring systems, but due to the dynamic nature of the English language, it can also be a bottleneck. The AC&NL Tutor consists of two components: (i) the semi-automatic authoring tool (SAAT) for ontology-based knowledge management and natural language processing, and (ii) intelligent tutoring system (Tutomat) that uses domain knowledge, delivered by the SAAT in a machine-readable form, and learner's model based on the creation of automatic, dynamic, and adaptive online course content. In our approach, a variety of available resources were integrated for natural language processing. These resources included WordNet 3.1 (wordnet.princeton.edu), CoreNLP 3.8 (stanfordnlp.github.io/CoreNLP/index.html), Senna SRL 3.0 (ronan.collobert.com/senna), verb lexicon from XTAG Project (http://www.cis.upenn.edu/~xtag/) and were enhanced with a customized set of rules that increased their performance (i.e. the quality of the concept maps, sentences and questions were hampered by inconsistencies and errors, which required us to develop a variety of enhancements). The main advantages of the SAAT tool are semi-automatic domain knowledge graph mining (result of natural language understanding process), automatic generation of domain knowledge concept map and different levels of natural language sentences and questions (result of natural language generation process). The Tutomat uses domain knowledge associated with the instructional unit, delivered by the SAAT in a machine-readable form and produces an adaptive and dynamic learning environment. The learning in the Tutomat is realized in so-called tutoring cycles. Each tutoring cycle is comprised of several elements: learning and teaching, testing and stereotype determination. The initial level of knowledge of the learner corresponds to the beginner stereotype, while each tutoring cycle ends with selecting the new stereotype level of expertise. In

each tutoring cycle, the learner is given only a subset of the domain knowledge to be learned. Domain knowledge size, presentation and testing, depend upon the learner's level of knowledge or a stereotype-based model (beginner, intermediate, advanced, expert) and what the learner has already learned (from learner model). It is important to note that, at the beginning of each tutoring cycle (teaching, learning and testing process), the Tutomat aims to observe domain knowledge that the learner has not learned yet. Such dynamic courseware allows individual tutor processing in the Tutomat.

Presenters:

***Ani Grubišić, PhD**, is an Associate Professor at the University of Split, Faculty of Science. She graduated at the same Faculty in 2001, got her MS in 2007 and PhD in 2012 at the University of Zagreb, Faculty of Electrical Engineering and Computing. Areas of scientific interest are intelligent tutoring systems, adaptive courseware and learning analytics in e-learning systems. She is a Principal Investigator of Project "Adaptive Courseware based on Natural Language Processing (AC & NL Tutor)", funded by the Office of Naval Research, USA. She is an author and co-author of more than thirty scientific papers.*

***Branko Žitko, PhD**, is an Associate Professor at the University of Split, Faculty of Science. He graduated at the same Faculty in 2001, got his MS in 2005 and PhD in 2010 at the University of Split, Faculty of Electrical Engineering and Computing. Areas of scientific interest are intelligent tutoring systems, natural language processing and knowledge representation in e-learning systems. He is a Co-Principal investigator of Project "Adaptive Courseware based on Natural Language Processing (AC&NL Tutor), funded by the Office of Naval Research, USA. He is an author and co-author of more than twenty scientific papers.*

***Angelina Gašpar, PhD**, is an Assistant Professor and a part-time lecturer at the Catholic Faculty of Theology, the University of Split. She got M.A in the English Language and Literature and the French Language and Literature in 1987 (the University of Zadar) and Ph.D. degree in Information and Communication Sciences in 2013 (the University of Zagreb). Research interests include natural language processing, computer-assisted translation, corpus linguistics, computer-assisted terminology extraction, term base structuring and special language. She is involved in the Project "Adaptive Courseware based on Natural Language Processing (AC&NL Tutor)", funded by the Office of Naval Research, USA, as a computational linguist.*

Saturday, September 21, 08:30-10:00 (PALMA II)

WSEP: 8TH WORKSHOP ON SOFTWARE ENGINEERING IN PRACTICE

The software is everywhere around us. The significant growth of ICT products and solutions depends on the quality of the used software. The software is essential enabler of future usage and growth of networked society surrounded with 50 billion of connected devices. Are we ready for such mass software production and keeping the software product life cycle continuous? How are the current researches and used software engineering practice correlated and ready to take responsibility for such broad and demanding software usage with quality, security and energy efficiency demands? What are the software products in the "software-as-a-service" era? Are we aware of software architecture demands and software life-cycle management? What challenges in software engineering are the most critical? Let's take opportunity to discuss these software engineering challenges and exchange experience between researchers and practitioners. Prepare your view and share it with others. Be on the workshop during the SoftCOM 2018 conference.

MODERATOR: Darko Huljenic, PhD, Ericsson Nikola Tesla d.d., Zagreb

Biography:

Dr. Darko Huljenić received his Ph.D. degrees from the University of Zagreb, Croatia, in 2001. He has been with Ericsson Nikola Tesla since 1984. His current position is Director of Research Unit. He expanded company research cooperation with the major Croatian Universities as well as some international research institution's. His main interests are open network architecture, software development methodologies and service oriented architecture. Dr. Huljenic holds a position of associate professor at the University of Zagreb, in the Faculty of Electrical Engineering and Computing, Telecommunications.

Reading Variations between Same Type IoT Sensors: MQ-2 Gas Sensor Use Case
Jelena Čulić Gambiroža (Ericsson Nikola Tesla, Croatia)

Software Estimation Practice in Croatia
Meri Lendić (Ericsson Nikola Tesla, Croatia), Josip Krnjić (Infinum, Croatia), Mili Turić (Venio indicium d.o.o. Croatia) and Linda Vicković (University of Split, Croatia)

Integration testing of base station internal Ethernet traffic using IXIA traffic generator
Julija Županović

Saturday, September 21, 08:30 – 10:00 (KAKTUS)

WESC: ERICSSON NIKOLA TESLA SUMMER CAMP 2019 WORKSHOP

Ericsson Nikola Tesla Summer Camp is a summer workshop for senior students from Croatian and universities from the region. The first Summer Camp was organized back in 2001 and since then more than 600 students participated. Students work five weeks on real problems in real industrial environment with mentors both from the company and universities.

MODERATORS:

Toni Mastelić, PhD, Researcher and Innovation coach

Ericsson Nikola Tesla d.d., Split

Toni Mastelic received his Ph.D. degrees from Vienna University of Technology, Austria, in 2015. He is a researcher at Ericsson Nikola Tesla d.d., Research department. He did his bachelor and masters studies in Computer Science at the University of Split, FESB, Croatia, where he received his Bachelor degree in 2009, and Master degree in 2011. Afterwards, he worked as a research and later on as university assistant at Vienna University of Technology, where he pursued his PhD. Finally, he received his PhD degree in 2015 at the Institute of Software Technology and Interactive Systems,Vienna University of Technology.

Ivana Nižetić Kosović, Researcher

Ericsson Nikola Tesla d.d., Split

Ivana Nižetić Kosović obtained her diploma in mathematics at Faculty of Science in Zagreb and completed her PhD at Faculty of Electrical Engineering and Computing, where she was working as an assistant professor. Her scientific interests include spatio-temporal reasoning, artificial intelligence and heterogenous data analysis. She is a researcher and in ETK Research, Split.

Hardware for Solar Radiation Soft Sensor
Team members: Antonia Bradarić, Duje Dujmović, Dinko Židić
Mentor(s): Matija Pauković, Toni Mastelić

Fire Hazard Risk – Machine Learning
Team members: Filip Butić, Daniela Džal
Mentor(s): Ivana Nižetić Kosović, Diana Škurić Kuraži

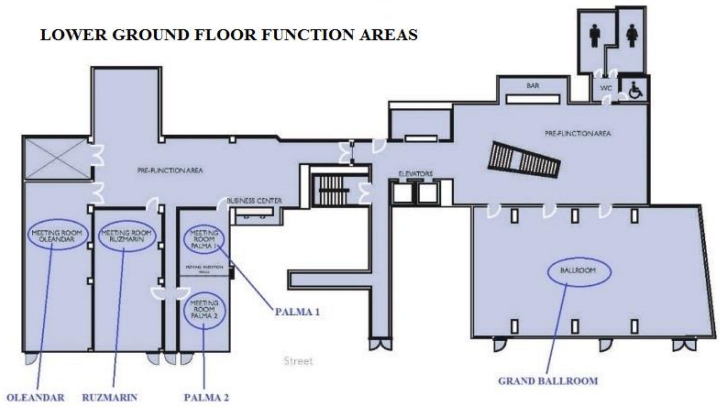
Sound based indoor localization
Team members: Stipan Batinić, Ana-Marija Sabljo
Mentor(s): Hrvoje Rudeš, Zoran Civadelić

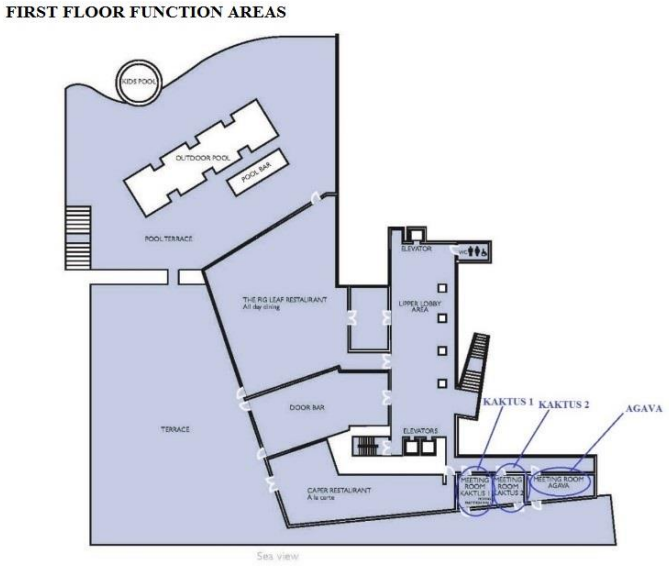
IoT Data Analytcs
Team members: Lucija Veić, Ana Vučina
Mentor(s): Jelena Čulić Gambiroža, Toni Mastelić, Mario Čagalj

Self-adaptive and remote controlled sensor station
Team members: Ivana Cvitković, Marin Vukosav
Mentor(s): Mario Čagalj, Toni Mastelić, Toni Perković

People Counter with 3D ToF camera
Team members: Monika Barišić, Ivan Čikotić
Mentor(s): Hrvoje Rudeš, Zoran Civadelić

HOTEL RADISSON BLU RESORT: FLOOR PLAN





GENERAL INFORMATION

VENUE

The 27th International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2019) will be held in Split.

Split is the largest city on the Croatian coast of the Adriatic Sea with a population of 180.000. The visit of Split can offer the travellers an extraordinary city tour without any need to take buses to reach the centre. Even today as you pass along the south promenade of the Palace, you can feel Diocle's spirit. You can also feel the light breeze blowing from the sea as it seems to be playing through the openings of the Cryptoporticus, welcoming to this town, travellers for whom as Diocles said, there will always be a bed, food, drink, music and the presence of God.

TRAVELING TO SPLIT

Split can be reached by air: directly from Amsterdam, Brussels, Franfurt, London, Lyon, Manchester, Munich, Paris, Vienna and via Zagreb from all world airports (for more information please visit Airport Split-Kastela); by ship: Split harbor is daily connected with Ancona. Ship connections are also available with Venice, Pescara and Bari.

WEATHER

In September the weather in Split is very nice, with an average temperature of about 20 degrees Celsius and the sea temperature is agreeable for swimming.

PROCEEDINGS

All participants will receive the Final Program and USB Proceedings when registering at the conference desk.

LANGUAGE

The Conference language is English.

REGISTRATION

Thursday, September 19: 08:00 – 16:00
Friday, September 20: 08:00 – 11:00, 14:30 – 17:00
Saturday, September 21: 08:00 – 10:30

SECRETARY

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