

# Program

	Wednesday, June 19		Thursday, June 20		Friday, June 21	
8:00 9:00 am	Registration					
9:00 10:00 am	Opening Ceremony		K3: Keynote 3: SMART GRID COMMUNICATIONS		K4: Keynote 4: TBD	
10:00 10:30 am			Coffee Break		Coffee Break	
10:30 11:00 am	Coffee Break		T1: SESSION T1: CRYPTOGRAPHY & NETWORK SECURITY T2: SESSION T2: HETEROGENEOUS & MULTI-HOP NETWORKS	Tut2: Tutorial 2: Mobile Cloud Computing	F1: SESSION F1: IMAGE PROCESSING & APPLICATIONS F2: SESSION F2: MULTIPLE ANTENNAS TECHNIQUES	Tut3: Tutorial 3: Wireless Small Cell Networks
11:00 am 12:00 pm	K1: Keynote 1: ROADMAP TO 4G AND BEYOND: LTE-A AND SMALL CELLS					
12:00 12:30 pm	K2: Keynote 2: HOW TO DENSIFY: MASSIVE (MIMO) OR SMALL (CELLS)					
12:30 12:45 pm						
12:45 1:00 pm						
1:00 2:00 pm	Lunch		Lunch		Lunch	
2:00 2:30 pm						
2:30 4:00 pm	W1: SESSION W1: MOBILE & CLOUD COMPUTING W2: SESSION W2: MULTI- CARRIER TECHNIQUES W3: SESSION W3: POSTERS SESSION	Tut1: Tutorial 1: Energy Efficiency in Wireless Communication Networks	Social Event & Banquet		F3: SESSION F3: HARDWARE & CIRCUIT DESIGN F4: SESSION F4: CELLULAR NETWORKS F5: SESSION F5: DIGITAL INFORMATION MANAGEMENT	
4:00 4:30 pm	Coffee Break					
4:30 6:00 pm	W4: SESSION W4: NETWORKS & INTERNET TECHNOLOGIES W5: SESSION W5: COMPUTATIONAL INTELLIGENCE APPLICATIONS IN SOFTWARE ENGINEERING					
6:00 6:30 pm						
6:30 7:00 pm						
7:00 9:30 pm	Reception					

## Wednesday, June 19

**8:00 AM - 9:00 AM**

**Registration**

Room: Registration Desk

**9:00 AM - 10:30 AM**

**Opening Ceremony**

**Dr. Hassan Artail, Dr. Youssef Nasser, Dr. Makram Suidan, Ministry of Telecommunications representative, Mr. Ziad Zorkot**

Room: Main Room

Welcome from the General Chairs - Dr. Hassan Artail  
Summary of the Technical Program by the TPC Chairs - Dr. Youssef Nasser  
Welcome from AUB - Dean Makram Suidan  
Status of the Telecom Sector in Lebanon - Ministry of Telecommunications  
Challenges in Mobile Broadband Evolution - Mr. Ziad Zorkot, Network Audit and Quality Manager, Touch

**10:30 AM - 11:00 AM**

**Coffee Break**

Room: Lobby

**11:00 AM - 12:00 PM**

**K1: Keynote 1: ROADMAP TO 4G AND BEYOND: LTE-A AND SMALL CELLS**

**Prof. Ian Akyildiz (Georgia Institute of Technology - USA)**

Room: Main Room

Chair: Zaher Dawy (American University of Beirut, Lebanon)

In order to meet the ever-growing need for wireless data and services, LTE Advanced and beyond 4G (B4G) cellular systems are advocating fundamental advances in both utilizing the radio access spectrum efficiently and providing efficient data and service delivery through new system architectures. A wide spectrum of advanced communication techniques comprising, among others, carrier aggregation, advanced MIMO, cooperative communication, or self-organizing networks, are currently being investigated and standardized. However, historic data regarding capacity improvements in wireless networks show that the largest gains ever obtained come mainly from the use of smaller cells. These can provide more than three orders of magnitude increase in network capacity. For this reason, the paradigm of Heterogeneous Cellular Networks (HetNet), comprised of a macrocell network underlaid by one or several tiers of small cells, has become a key element in the envisioned future cellular system of every wireless carrier across the world. A tremendous activity on small cells has been conducted in recent years by standardization bodies including 3GPP, 3GPP2 and the WIMAX forum. Similarly, world-wide academic research and industry efforts, which include leading service providers and equipment manufacturers, have embraced small-cell technology as a key element for future wireless cellular systems. Although in order to fully exploit the potential of this technology, a number of technical challenges still need to be solved, a varied range of small cell solutions for cellular systems have already been adopted and deployed.

**12:00 PM - 1:00 PM**

**K2: Keynote 2: HOW TO DENSIFY: MASSIVE (MIMO) OR SMALL (CELLS)**

**Prof. Merouane Debbah (Supélec - France)**

Room: Main Room

Chair: Youssef Nasser (American University of Beirut, Lebanon)

Wireless networks are inherently limited by their own interference. Therefore, a lot of research focuses on interference reduction techniques, such as multiuser MIMO, interference alignment, interference coordination or multi-cell processing. Although these techniques might lead to considerable performance gains, it is unlikely that they will be able to meet the demand for wireless data traffic in the future. Therefore, a significant network densification, i.e., increasing the number of antennas per unit area, is inevitable. One way of densifying the network consists in cell-size shrinking, such as the deployment of femto or small cells, which comes at the cost of additional equipments and increased interference. Another much simpler, but also less efficient, option is the use of massively more antennas at each base station (BS). In this talk, we will discuss the challenges of small cell versus massive MIMO networks and show how Random Matrices provides the ideal framework to model, design and optimize beyond LTE (Long Term Evolution) networks.

**1:00 PM - 2:30 PM**

**Lunch**

Room: Restaurant

2:30 PM - 6:00 PM

**Tut1: Tutorial 1: Energy Efficiency in Wireless Communication Networks**

Dr. Emilio Calvanese (CEA/LETI - France)

Room: Main Room

Chair: Youssef Nasser (American University of Beirut, Lebanon)

The environmental and energy efficiency issues became more obvious to a larger audience in the last. Recently, increasing maturity of mobile technology in combination with the growing amount of equipment deployed each year has woken up the need of innovating in the field of energy efficient communications.

In the last decade telecommunication has experienced a tremendous success causing proliferation and demand for ubiquitous heterogeneous broadband mobile wireless communications. Up to now, innovation has mainly targeted to improve wireless networks coverage and capacity while meeting the QoS for users admitted in the system. Nowadays, the number of mobile subscribers equals more than half the global population. Forecast on telecommunication market assume an increase in subscribers, per subscriber's data rate and, the roll out of additional base stations for next generation mobile networks.

The undesired consequence is the growth of wireless network's energy consumption which will cause an increase of the global carbon dioxide (CO<sub>2</sub>) emissions and, impose more and more challenging operational cost for operators. Communication energy efficiency represents indeed an alarming bottleneck in the telecommunication growth paradigm.

The 'A Survey on Energy Efficiency in Wireless Communication Networks' tutorial presents and analyzes the most significant technical proposals in the field of green communications for wireless networks. A key objective of our tutorial is to go beyond the current state of the art and provide a view into a potential holistic analysis that combines and extends the current set of energy saving techniques. With this tutorial, we first present the specific challenges for green communications. Then, after presenting the current proposed solutions, approaches and trends, we set the technical framework introducing currently investigated metrics, topologies and architectures for wireless networks' energy efficiency. In a second part of the tutorial we present limitations and costs of hardware devices. In the thirds part of the tutorial we discuss on energy efficient protocol and network management solutions, ranging from coding and modulation scaling to interference management, resource allocation, multi-RAT, cognitive radio and discontinuous transmission techniques. In the end, this tutorial will present some future visionary network design, their possible backward capability with current standards and summarize some open problems on critical energy-efficient design issues.

Targeted audiences for the 'A Survey on Energy Efficiency in Wireless Communication Networks' tutorial are academia, industry, research institutes, PhD students and project managers.

2:30 PM - 4:00 PM

**W1: SESSION W1: MOBILE & CLOUD COMPUTING**

Room: Room 1

Chair: Khaleel W Mershad (American University of Beirut, Lebanon)

***Geometric Spanners: Recent Results and Open Directions***

Iyad Kanj (DePaul University, USA)

***Addressing Openness and Portability in Outdoor Pervasive Role-Playing Games***

Vlasios Kasapakis (University of the Aegean, Greece); Damianos Gavallas (University of the Aegean, Greece); Nikos Bubaris (University of the Aegean, Greece)

***CROWN: Discovering and Consuming Services in Vehicular Clouds***

Khaleel W Mershad (American University of Beirut, Lebanon); Hassan A. Artail (American University of Beirut, Lebanon)

***Accountable Energy Monitoring for Green Service Routing in the Cloud***

Wassim Itani (American University of Beirut, Lebanon); Cesar Ghali (American University of Beirut, Lebanon); Ali Chehab (American University of Beirut, Lebanon); Ayman Kayssi (American University of Beirut, Lebanon); Imad H Elhajj (American University of Beirut, Lebanon)

***Cloud Providers Collaboration for a Higher Service level in Cloud Computing***

Khaleel W Mershad (American University of Beirut, Lebanon); Abdulrahman Kaitoua (American University of Beirut &amp; QNRF, Lebanon); Hassan A. Artail (American University of Beirut, Lebanon); Mazen A. R. Saghir (Texas A&amp;M University at Qatar, Qatar); Hazem Hajj (American University of Beirut, Lebanon)

**W2: SESSION W2: MULTI-CARRIER TECHNIQUES**

Room: Room 2

Chair: Zhu Han (University of Houston, USA)

***USRP2 Implementation of Compressive Sensing Based Channel Estimation in OFDM***

Tina Mathews (University of Houston, USA); Zhu Han (University of Houston, USA)

***Performance analysis of the Wavelet-OFDM new scheme in AWGN channel***

Alaa Ghaith (Faculty of Sciences I, Lebanese University, Lebanon); Rima Hatoum (Orange Labs, France); Hiba Mrad (Faculty of Sciences I, Lebanese University, Lebanon); Ali Alaeddine (Lebanese University, Lebanon)

***A Novel Bandwidth Efficient Modulation Scheme for Asynchronous OCDMA with Projected PIC Multiuser Detection***

Hussein E. Seleem (King Saud University & College of Engineering, Saudi Arabia); Abdelouhab Bentrchia (King Saud University, Saudi Arabia); Habib Fathallah (King Saud University, Saudi Arabia)

***Design of Interleaved Sequences for Joint Channel Estimation and PAPR Reduction***

Ralph Mounzer (INSA-Rennes, France); Jean-François Héland (IETR, France); Youssef Nasser (American University of Beirut, Lebanon)

***Joint CFO and Time-varying Channel Estimation by Particle Filtering in OFDM Systems***

Hussein Hijazi (Grenoble-INP, GIPSA-Lab, France); Achraf Dhayni (STMicroelectronics, France); Ali Al Ghouwayel (LIU, Lebanon)

**W3: SESSION W3: POSTERS SESSION**

Room: Lobby

Chair: Hassan A. Artail (American University of Beirut, Lebanon)

***Combinatorial method of performance calculation in Gilbert-Elliott channels***

Manuel Hensel (Fraunhofer Institute for Telecommunications - Heinrich-Hertz-Institute, Germany); Cornelius Hellge (Fraunhofer Institute for Telecommunications - Heinrich-Hertz-Institute, Germany); Thomas Schierl (Fraunhofer HHI, Germany)

***Fairness Enhancement Using Transmission Scheduling in Multi-Hop Wireless Mesh Networks***

Jalaa Hoblos (Hiram College, USA)

***A New Distributed Decision Making Scheme for the IEEE 802.15.3 Parent/Child Model***

Imad Jamil (INSA & IETR, France); Samar Sindian (INSA & IETR, France); Ayman Khalil (Institute of Electronics and Telecommunications of Rennes - IETR & INSA, France); Matthieu Crussière (IETR - Electronics and Telecommunications Research Institute of Rennes (IETR) & INSA - National Institute of Applied Sciences, France); Jean-François Héland (IETR, France)

***A Resource Reservation Attack against LTE Networks***

Ramzi Bassil (American University of Beirut, Lebanon); Imad H Elhadj (American University of Beirut, Lebanon); Ali Chehab (American University of Beirut, Lebanon); Ayman Kayssi (American University of Beirut, Lebanon)

***Performance Evaluation on Dynamic Dual Layer Beamforming Transmission in TDD LTE System***

Pengpeng Song (NokiaSiemensNetworks & NokiaSiemensNetworks, P.R. China); Shi Jin (NokiaSiemensNetworks, P.R. China)

***Out of samples extensions for SC-LLE, new nonlinear dimensionality reduction algorithm***

Andre Bigand (Universite du Littoral (ULCO), France); Oussama Bazzi (Lebanese University, Lebanon)

***Probability Collectives Using Response Surface Estimation***

Wei Zhao (Hunan Police Academy, P.R. China); Nan Wang (National University of Defense Technology, P.R. China)

***Cryptographic Vulnerabilities in Real-Life Web Servers***

Eman Alashwali (King Abdulaziz University & College of Computing & IT, Saudi Arabia)

***Green Virtual Desktop: Design and Operation***

Mayssa Youssef (Orange Labs - France, France); Ruby Krishnaswamy (Orange Labs, France); Adam Ouorou (Orange Labs, France)

***A performance study of mobile nodes in a Wireless Sensor Network***

Antoinette Mouwad (Murex Systems, Lebanon); Gerard Chalhoub (Clermont University, France); Gilbert Habib (Balamand University, Lebanon); Michel Misson (Université d'Auvergne, France)

***On Sensor Selection in Mobile Devices based on Energy, Application Accuracy, and Context Metrics***

Sireen Taleb (American University of Beirut, Lebanon); Nadine Abbas (American University of Beirut, Lebanon); Hazem Hajj (American University of Beirut, Lebanon); Zaher Dawy (American University of Beirut, Lebanon)

***Integrating Pressure and Accelerometer Sensing for Improved Activity Recognition on Smartphones***

Ammar El Halabi (American University of Beirut, Lebanon); Hassan A. Artail (American University of Beirut, Lebanon)

***A New MAC design in LTE for MIMO Multiuser Schemes***

Reema Imran (University of Jordan, Jordan); Nizar Zorba (QMIC, Qatar); Elias Yaacoub (Qatar Mobility Innovations Center (QMIC), Qatar); Hossam S. Hassanein (Queen's University, Canada); Christos Verikoukis (Telecommunications Technological Centre of Catalonia, Spain)

**4:00 PM - 4:30 PM**

**Coffee Break**

Room: Lobby

**4:30 PM - 6:30 PM**

**W4: SESSION W4: NETWORKS & INTERNET TECHNOLOGIES**

Room: Room 1

Chair: Chadi Barakat (INRIA Sophia Antipolis, France)

***Minimizing Bandwidth on Peering Links with Deflection in Named Data Networking***

Chadi Barakat (INRIA Sophia Antipolis, France); Anshuman Kalla (INRIA, France); Damien Saucez (INRIA, France); Thierry Turletti (INRIA, France)

***A TCP delay based mechanism for detecting congestion in the Internet***

Khaled Dassouki (Telecom SudParis, Lebanon); Haidar Safa (American University of Beirut, Lebanon); Herve Debar (Télécom SudParis & Institut Télécom, France); Abbas Hijazi (Lebanese University, Lebanon)

***Real-time Radio Emulation Environment for Combat Net Radio Networks***

Aleksi Marttinen (Aalto University & School of Electrical Engineering, Finland); Shekar Nethi (Aalto University, Finland); Risto Järvinen (Aalto University, Finland); Riku Jäntti (Aalto University School of Electrical Engineering, Finland)

***Cooperative and Coalition Formation Games among Energy Consumers in the Smart Grid***

Yassine Abdulsalam (Alcatel-Lucent, Canada)

***Interpreting Inter-organizational Information Technology Networks: a Chaos Theory Approach***

Holger Schrödl (Otto-von-Guericke University of Magdeburg, Germany)

***P2PWeb: a Client/Server and P2P Hybrid Architecture for Content Delivery over Internet***

Majd Ghareeb (Univ, France); Soufiane Rouibia (TMG, France); Benoit Parrein (University of Nantes, France); Mohamad Raad (LIU- Lebanese International University, Lebanon); Cedric Thareau (TMG, France)

**W5: SESSION W5: COMPUTATIONAL INTELLIGENCE APPLICATIONS IN SOFTWARE ENGINEERING**

Room: Room 2

Chair: Ali Bou Nassif (University of Western Ontario, Canada)

***An Enterprise Architecture Mapping Approach for Realizing e-Government***

Sukaina Al-Nasrawi (Beirut Arab University & United Nations Economic and Social Commission for Western Asia, Lebanon); Maysoun Ibrahim (Beirut Arab University, Lebanon)

***Open Source Development: Examining Bugs Reporting Activity among Mozilla Community participants***

Hela Masmoudi (Telecom, France); Imed Boughzala (Telecom Ecole de Management & Institut Mines-Telecom, France)

***Fault-tolerance capabilities of a software-implemented Hopfield Neural Network***

Wassim M. Mansour (TIMA Labs. & Institut National Polytechnique de Grenoble (INPG), France); Raoul J Velazco (TIMA, France); Rafic A. Ayoubi (University of Balamand, Lebanon); Wassim El Falou (Lebanese University, Lebanon); Haissam Ziade (Lebanese University, Lebanon)

***Business Intelligence Solutions in Healthcare A Case Study: Transforming OLTP system to BI Solution***

Osama Ali (UWO, Canada); Ali Bou Nassif (University of Western Ontario, Canada); Luiz F. Capretz (University of Western Ontario, Canada)

**TRAM: An Approach for Assigning Bug Reports using their Metadata**

Shadi Banitaan (University of Detroit Mercy, USA); Mamdouh Alenezi (Prince Sultan University, Saudi Arabia)

**A Comparison Between Decision Trees and Decision Tree Forest Models for Software Development Effort Estimation**

Ali Bou Nassif (University of Western Ontario, Canada); Mohammad Azzeh (Applied Science University, Jordan); Luiz F. Capretz (University of Western Ontario, Canada); Danny Ho (NFA Estimation Inc., Canada)

**7:00 PM - 9:30 PM**

Reception

**Thursday, June 20**

**9:00 AM - 10:00 AM**

**K3: Keynote 3: SMART GRID COMMUNICATIONS**

**Prof. Brian Evans (University of Texas at Austin, USA)**

Room: Main Room

Chair: Nidal Nasser (Alfaisal University, Saudi Arabia)

Smart Grid systems intelligently monitor and control energy flows in order to improve efficiency and reliability of power delivery. A local utility would receive customer load profiles from smart meters, and adjust power generation and energy distribution accordingly. Smart meters could transmit usage data over powerline or wireless links once per minute.

Smart Grid communication over outdoor power lines is attractive because it uses existing infrastructure. However, it is limited by the strong impulsive noise, esp. from power electronics and wireless signals, within the 3-500 kHz transmission band.

In improving reliability of outdoor powerline communication (PLC), we derive impulsive noise models using field measurements, develop receiver methods to mitigate the noise, and implement those methods in our real-time testbed. One of our impulsive noise models has been adopted by the IEEE 1901.2 PLC standard.

This research is supported by National Instruments, as well as SRC GRC ICSS Task 1836.063 with sponsors Freescale Semiconductor, IBM and Texas Instruments.

**10:00 AM - 10:30 AM**

Coffee Break

Room: Lobby

**10:30 AM - 12:45 PM**

**T1: SESSION T1: CRYPTOGRAPHY & NETWORK SECURITY**

Room: Room 1

Chair: Iyad Kanj (DePaul University, USA)

**Failure Preventive Mechanism for IPsec Gateways**

Daniel Palomares (Orange Labs, France); Daniel Migault (Orange Labs, France); Maryline Laurent (Institut Mines-Télécom, Télécom SudParis, France)

**Low-Overhead Anonymous Routing**

Alaa Atassi (American University of Beirut, Lebanon); Imad Sarji (American University of Beirut, Lebanon); Imad H Elhadj (American University of Beirut, Lebanon); Ali Chehab (American University of Beirut, Lebanon); Ayman Kayssi (American University of Beirut, Lebanon)

**Internal Security Attacks on SCADA Systems**

Naoum Sayegh (American University of Beirut, Lebanon); Ali Chehab (American University of Beirut, Lebanon); Imad H Elhadj (American University of Beirut, Lebanon); Ayman Kayssi (American University of Beirut, Lebanon)

**Botnet Detection: A Cooperative Game Theoretical Correlation-Based Model**

Noura Al Ebri (Kustar, UAE); Hadi Otrok (Khalifa University of Science, Technology & Research (KUSTAR), UAE); Azzam Mourad (Lebanese American University (LAU), Lebanon); Yousof Al-Hammadi (Khalifa University of Science Technology and Research, UAE)

**Securing Modbus Transactions Using Hash-Based Message Authentication Codes and Stream Transmission Control Protocol**

Garrett Hayes (University of Ontario Institute of Technology, Canada); Khalil El-Khatib (University of Ontario Institute of Technology, Canada)

**An Efficiently Secure ECC Scalar Multiplication Method Against Power Analysis Attacks on Resource Constrained Devices**

Hilal Houssain (LIMOS Laboratory, CNRS France, Saudi Arabia); Turki Al-Somani (Umm Al-Qura University, Saudi Arabia)

**A Dynamic Faulty Node Detection Scheme Using Adaptive Sleep Scheduling for Wireless Sensor Networks that Employ Data Aggregation**

Tarek Al Choikani (American University of Beirut, Lebanon); Basel Aroudaki (American University of Beirut, Lebanon); Hazar Ashouri (American University of Beirut, Lebanon); Hassan A. Artail (American University of Beirut, Lebanon)

**T2: SESSION T2: HETEROGENEOUS & MULTI-HOP NETWORKS**

Room: Room 2

Chair: Ayman Radwan (Instituto de Telecomunicações & Queen's University, Portugal)

**Energy Efficiency Performance of WiFi/WiMedia Relaying in Hybrid Ad-hoc Networks**

Firooz B. Saghezchi (Instituto de Telecomunicações, Portugal); Ayman Radwan (Instituto de Telecomunicações & Queen's University, Portugal); Jonathan Rodriguez (Instituto de Telecomunicações, Portugal)

**A Hybrid Approach for RAT Selection in Wireless Heterogeneous Networks**

Mohamad Yassin (Universite Saint-Joseph & IRISA - Universite de Rennes 1, France); Samer Lahoud (IRISA, University of Rennes 1, France); Marc Ibrahim (Saint Joseph University & Saint Joseph University - ESIB, Lebanon)

**Routing coded messages in wireless networks**

Samih Abdul-Nabi (Lebanese International University (LIU), Lebanon); Ayman Khalil (Institute of Electronics and Telecommunications of Rennes - IETR & INSA, France); Jean-François H elard (IETR, France)

**Closed-form Expression for Outage Probability in Relay-Based Cooperative Diversity Systems over Rayleigh Fading Channels with Interference**

Rami Mohaisen (Jordan University of Science and Technology, Jordan); Mamoun F. Al-Mistarihi (Jordan University of Science and Technology, Jordan)

**Energy Analysis of Network Coding in Hard Vertical Handovers**

Riccardo Bassoli (Instituto de Telecomunicações & University of Surrey, Portugal); Hugo Marques (University of Aveiro, Portugal); Ayman Radwan (Instituto de Telecomunicações & Queen's University, Portugal); Jonathan Rodriguez (Instituto de Telecomunicações, Portugal); Seiamak Vahid (University of Surrey, United Kingdom); Rahim Tafazolli (University of Surrey, United Kingdom)

**A Learning-Based Approach for Network Selection in WLAN/3G Heterogeneous Network**

Nadine Abbas (American University of Beirut, Lebanon); Sireen Taleb (American University of Beirut, Lebanon); Hazem Hajj (American University of Beirut, Lebanon); Zaher Dawy (American University of Beirut, Lebanon)

**Dynamic Superframe Size-based Admission Control in Parent/Child HR WPANs**

Samar Sindian (INSA & IETR, France); Abed Ellatif Samhat (Lebanese University, Lebanon); Ayman Khalil (Institute of Electronics and Telecommunications of Rennes - IETR & INSA, France); Matthieu Cruss iere (IETR - Electronics and Telecommunications Research Institute of Rennes (IETR) & INSA - National Institute of Applied Sciences, France); Jean-Fran ois H elard (IETR, France)

**10:30 AM - 1:00 PM**

**Tut2: Tutorial 2: Mobile Cloud Computing**

**Dr. Dusit Nayito (Nanyang Technological University, Singapore)**

Room: Main Room

Chair: Zaher Dawy (American University of Beirut, Lebanon)

Together with an explosive growth of the mobile applications and the usefulness of the cloud computing concepts, mobile cloud computing has emerged as a potential enabling technology for future generation mobile services and applications. Mobile cloud computing integrates the cloud computing concepts into the mobile environment and overcomes obstacles related to the performance improvement of mobile computing systems (e.g., battery life, bandwidth, and capacity), networking environment (e.g.,



heterogeneity, scalability, and availability), and mobile system security (e.g., reliability and privacy).

In this tutorial, an exposition to mobile cloud computing will be provided. Starting with the motivations of mobile cloud computing, the basics of the relevant technologies including mobile and wireless services, grid and utility computing, and cloud computing will be discussed. Then, the details of a mobile computing architecture and its components will be described. In particular, an overview of the concepts such as data center, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) will be given. Next, a variety of applications which use mobile cloud computing will be discussed. Then, the research issues and challenges in mobile cloud services, and different approaches proposed in the literature to solve these challenges will be discussed. In this context, two optimization models developed for mobility-aware offloading and admission control of mobile cloud users in mobile cloud computing environment will be presented. To this end, we will outline several major research directions in mobile cloud computing which include power management and quality-of-service support for mobile devices, standard interface for data exchange, service pricing and revenue management for service providers, and service convergence for application developers.

**12:45 PM - 2:00 PM**

**Lunch**

Room: Restaurant

**2:00 PM - 6:00 PM**

**Social Event & Banquet**

**Friday, June 21**

**9:00 AM - 10:00 AM**

**K4: Keynote 4: TBD**

Room: Main Room

**10:00 AM - 10:30 AM**

**Coffee Break**

Room: Lobby

**10:30 AM - 12:30 PM**

**F1: SESSION F1: IMAGE PROCESSING & APPLICATIONS**

Room: Room 1

Chair: Adnan Al-Alaoui (American University of Beirut, Lebanon)

***A Reduced-Reference Computer-Generated Images Quality Metric Based On RVM***

Andre Bigand (Universite du Littoral (ULCO), France)

***A Hybrid Filter for Image Despeckling with Wavelet-Based Denoising and Spatial Filtering***

Adib Akl (Holy-Spirit University of Kaslik, Lebanon); Charles Yaacoub (Holy-Spirit University of Kaslik, Lebanon)

***Adaptive Encryption Using Pseudo-Noise Sequences for Medical Images***

Ahmed Mahmood (University of Guelph, Canada); Robert D. Dony (University of Guelph, Canada)

***Effect of Hand Jitter on Video Compression Algorithms for Mobile Devices***

Rony Ferzli (Microsoft, USA); Michael P McGarry (University of Texas at El Paso, USA); Adnan Al-Alaoui (American University of Beirut, Lebanon)

***Using Disparity Map for Directional Adaptive Lifting Scheme for Stereo Image Residuals***

Rony Darazi (Antonine University, Lebanon); Amit Kumar K. C. (Université Catholique de Louvain, Belgium); Talar Atechian (Antonine University, Lebanon); Benoit Macq (UCL, Belgium)

**F2: SESSION F2: MULTIPLE ANTENNAS TECHNIQUES**

Room: Room 2

Chair: Hussein Hijazi (Grenoble-INP, GIPSA-Lab, France)



**On the design of coded MIMO systems**

Mohamad Sayed Hassan (Orange Labs/Alten, France); Ammar El Falou (University of Rennes 1, IRISA, INRIA, France); Charlotte Langlais (Télécom Bretagne, France)

**Flexible and Efficient Architecture Design for MIMO MMSE-IC Linear Turbo-Equalization**

Mostafa Rizk (Telecom Bretagne & Lebanese University, France); Amer Baghdadi (Télécom Bretagne, France); Michel Jezequel (Telecom Bretagne, France); Mohanna Yasser (LebUni, Lebanon); Youssef Atat (Lebanese University, Lebanon)

**A Novel Stochastic Geometrical Model for Wideband MIMO-V2V Channels**

Ahmad A ElMoslimany (Arizona State University & Nile University, USA); Amr El-Keyi (Nile University, Egypt); Yahya Mohasseb (Nile University, Egypt)

**dmin-based precoder applied to non-binary LDPC coded MIMO system**

Tarek Chehade (Lab-STICC UMR CNRS 6285 UBO, France); Philippe Rostaing (University of Brest, France); Ludovic Collin (LEST, CRNS, Brest, France); Emanuel Radoi (University of Brest & CNRS UMR 6285 Lab-STICC, France); Oussama Bazzi (Lebanese University, Lebanon)

**Data transmission using time reversal technique - Results of reverberating chamber measurements**

Younni Ziade (Beirut Arab University, Lebanon); Joe Wiart (Orange- France Telecom, France)

**A Bayesian Matching Pursuit Based Scheduling Algorithm for Feedback Reduction in MIMO Broadcast Channels**

Hussain J. Shibli (King Abdullah University of Science and Technology, Saudi Arabia); Mohammed Eltayeb (The University of Akron & King Fahd University of Petroleum & Minerals, USA); Tareq Y. Al-Naffouri (King Abdullah University of Science and Technology, USA)

**10:30 AM - 1:00 PM**

**Tut3: Tutorial 3: Wireless Small Cell Networks**

**Dr. Walid Saad (University of Miami, USA)**

Room: Main Room

Chair: Hassan A. Artail (American University of Beirut, Lebanon)

Small cell networks (SCNs) are seen as a promising solution for boosting the capacity of wireless networks, while efficiently offloading data and expanding coverage in a cost-effective manner. In this tutorial, we provide a comprehensive overview on SCNs while highlighting the key challenges, associated techniques, and the future landscape. First, we provide an overview on advanced analytical techniques, such as stochastic geometry, suitable for modeling and analyzing SCNs. We show how these new spatial and random statistical models provide tractable and powerful tools for computing network performance metrics, such as coverage probability and spectral efficiency. Second, we delve into the details of advanced interference management techniques tailored for the unique features of SCNs. In particular, we introduce key concepts such as cell range expansion, cell selection, and adaptive resource partitioning that lie at the heart of next-generation LTE-Advanced systems. Then, we discuss in detail the concept of self-organizing networks (SONs) as it applies to small cell deployment. Here, we focus on novel game-theoretic and reinforcement learning techniques that are seen as a key enabler for deploying self-optimizing and self-configuring heterogeneous and small-cell networks. We conclude the tutorial by providing an in-depth overview of the current and future challenges facing the large-scale deployment of SCNs.

**12:45 PM - 2:00 PM**

**Lunch**

Room: Restaurant

**2:00 PM - 4:00 PM**

**F3: SESSION F3: HARDWARE & CIRCUIT DESIGN**

Room: Main Room

Chair: Andre Bigand (Universite du Littoral (ULCO), France)

**Testing of N-Stage Pipelined ADC using Test Input Regeneration and Sliding Window Techniques**

Sahar Hamed (Cairo University, Egypt); Ahmed Khalil (Cairo University, Egypt); Mohamed B Abdelhalim (Arab Academy for Science, Technology & Maritime Transport, Egypt); Hassanein H. Amer (American University in Cairo (AUC), Egypt); Ahmed H. Madian (Egyptian atomic energy authority, NCRRT, Egypt)

**Parallel Edge Detection Based on Digital Differentiator Approximation**

Mohammed Baydoun (American University of Beirut, Lebanon); Adnan Al-Alaoui (American University of Beirut, Lebanon);

Rony Ferzli (Microsoft, USA)

***Internet-controlled Dynamic Reconfiguration for FPGA-based Embedded Systems***

Ali Hayek (University of Kassel, Germany); Josef Boercsoek (University of Kassel, Germany); Sebastian Domes (University of Kassel, Germany)

***MSRR Metamaterial-Based Antenna System for MIMO Applications***

Jalal Jomaah (Grenoble, France); Hussam Ayad (Grenoble INP, France)

***Accelerating with 512-bit SIMD - A Case Study for Molecular Dynamics Simulation on Intel's Knights Corner***

Yi Zheng (School of Computer Science National University of Defense Technology, P.R. China); Juan Chen (National University of Defense Technology, P.R. China); Qiang Wu (National University of Defense Technology & School of Computer Science, P.R. China); Tao Tang (National University of Defense Technology, P.R. China)

***Statistical Analysis-Based Approach for Check Node Processor Inputs of NB-LDPC Decoder***

Ali Al Ghouwayel (LIU, Lebanon); Hussein Hijazi (Grenoble-INP, GIPSA-Lab, France); Ali Alaeddine (Lebanese University, Lebanon)

**F4: SESSION F4: CELLULAR NETWORKS**

Room: Room 1

Chair: Elias Yaacoub (Qatar Mobility Innovations Center (QMIC), Qatar)

***Empirical Correction of the Okumura-Hata Model for the 900 MHz band in Egypt***

Muhammad Farhoud (Nile University, Egypt); Amr El-Keyi (Nile University, Egypt); Ahmed Sultan (Alexandria University, Egypt)

***Enhancing the Quality of Experience of Video Streaming in LTE Networks Using Distributed Antenna Systems***

Elias Yaacoub (Qatar Mobility Innovations Center (QMIC), Qatar); Nizar Zorba (QMIC, Qatar)

***Quality of Service Performance of the Best-M OFDMA Feedback Strategy***

Hani Alyazidi (Florida Institute of Technology, USA); Ivica N. Kostanic (Florida Institute of Technology, USA)

***Maximizing the Signal to Leakage Ratio in Downlink Cellular Networks***

Ahmed Hindy (University of Texas at Dallas, USA); Amr El-Keyi (Nile University, Egypt); Mohammed Nafie (Nile University & Cairo University, Egypt); Antonia Tulino (Bell Labs, USA)

***On Antenna Parameters Self Optimization in LTE Cellular Networks***

Ferhad Kasem (American University of Beirut, Lebanon); Abdullah Haskou (American University of Beirut (AUB), Lebanon); Zaher Dawy (American University of Beirut, Lebanon)

***On the Capacity and Spatial Fairness Trade-off in Planning Sectorization and Frequency Reuse***

Ali Imran (Qatar Mobility Innovation Center (QMIC), Qatar); Elias Yaacoub (Qatar Mobility Innovations Center (QMIC), Qatar); Zaher Dawy (American University of Beirut, Lebanon); Adnan Abu-Dayya (QMIC, Qatar)

**F5: SESSION F5: DIGITAL INFORMATION MANAGEMENT**

Room: Room 2

Chair: Khalil El-Khatib (University of Ontario Institute of Technology, Canada)

***The State of the Art in Electroencephalogram and Access Control***

Abdulaziz Almeahmadi (University of Ontario Institute of Technology, Canada); Khalil El-Khatib (University of Ontario Institute of Technology, Canada)

***Generic Evaluation Framework for Games Development methodology***

Rula Al-azawi (Gulf College, Oman); Aladdin Ayesh (De Montfort University, United Kingdom); Mohaned Al. Obaidy (Gulf College, Oman)

***Truncated Singular Value Decomposition for Semantic-Based Data Retrieval***

Choukri Djellali (University of Quebec at Montréal & LATECE & LANCI UQAM, Canada)

***Improving text categorization: a fully automated ontology based approach***

Machhour Hamid (ENSIAS, Mohammed V Souissi University, Morocco); Kassou Ismail (ENSIAS, Mohammed V Souissi

University, Morocco)

***Isolating Failing Test Cases: A Comparative Experimental Study of Clustering Techniques***

Joan Farjo (American University of Beirut, Lebanon); Wassim Masri (American University of Beirut, Lebanon); Hazem Hajj (American University of Beirut, Lebanon)

***A Survey on Mobile Tourism Recommender Systems***

Damianos Gavalas (University of the Aegean, Greece); Vlasios Kasapakis (University of the Aegean, Greece); Charalampos Konstantopoulos (University of Piraeus, Greece); Konstantinos Mastakas (University of Athens, Greece); Grammati Pantziou (Technological Educational Institution of Athens, Greece)