Program

2012 IEEE Globecom Workshops

GC'12 Workshop - RuralComm 2012: GC'12 Workshop: Second International Workshop on Rural Communications

Session I - Optimization for rural areas

Cost/Revenue Optimization of WiMAX Networks with Relay Power Saving Modes: Measurement-Based Scenario in a Hilly Region
Fernando J. Velez (University of Beira Interior, Portugal), Joao R. Oliveira (Instituto de Telecomunicacoes, Universidade da Beira Interior, Portugal), Daniel Robalo (IT-DEM/University of Beira Interior, Portugal), Oliver D. Holland (King's College London, United Kingdom), Hamid Aghvami (King's College London, United Kingdom) .............................................................................................................. 1

Protocol Based Selective FIB Download for Distributed Forwarding Architecture
Hany Mohamed (EGYPT, Egypt), Ahmed Bashandy (Cairo University, USA), Samir I. Shaheen (Cairo University, Giza, Egypt) ................................................................................................................................. 7

Session II - Coverage issues in rural areas

Regional Coverage Scheme Based on LEO micro-satellite formation
Bingcai Chen (Harbin Engineering University, P.R. China), Zhinan Li (Harbin Engineering University, P.R. China), Xiaodong Yang (Harbin Engineering University, P.R. China) ................................................................................................................................................................. 13

Actual and predicted coverage of multiuser MIMO based fixed wireless access in rural areas
Hajime Suzuki (CSIRO, Australia) ................................................................................................................................................................. 19

Session III - Backhaul networks for rural areas

QoS-aware Wireless Back-haul Network for Rural Areas in Practice
Christian Niephaus (Fraunhofer FOKUS, Germany), Mathias Kretschmer (Fraunhofer FOKUS, Germany), Kari Jonas (Fraunhofer FOKUS, Germany) ................................................................................................................................. 24

ROFL: Restoration of Failures through Link-Bandwidth Sharing
Daniel Philip Venmani (Orange Labs, France) ................................................................................................................................................................. 30

Session III - Broadband access networks

Integrated Solutions for Broadband Access in Brazilian Amazon Rural Areas
Lamartine V. de Souza (UFPA, Brazil), Joao Crisostomo Weyl Costa (UFPA, Brazil), Carlos Renato Francês (Universidade Federal do Pará, Brazil) ................................................................................................................................. 36

GC'12 Workshop - BWA: GC'12 Workshop: The 8th Broadband Wireless Access Workshop

Invited paper

Power-Efficient Persistent Web-based Cellular Connectivity
Giridhar Mandyam (Qualcomm, USA) ................................................................................................................................................................. 40
Energy/Service-Aware Networks

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Challenges in Transmitting Scalable Video over Multi-Radio Networks</td>
<td>Vivek Gupta (Intel, USA), Srinivasa Somayazulu (Intel Research and Development, USA), Nageen Himayat (Intel Corporation, USA), Harsh Verma (R-Systems International, USA), Mohan Bisht (R-Systems International, USA), Vikram Nandwani (R-Systems International, USA)</td>
<td>46</td>
</tr>
<tr>
<td>MOS-driven Energy Efficient Power Allocation for Wireless Video Communications</td>
<td>Wenmin Ma (Beijing University of Posts and Telecommunications, P.R. China), Haijun Zhang (Beijing University of Posts and Telecommunications, P.R. China), Wei Zheng (BUPT, P.R. China), Zhaoming Lu (BUPT, P.R. China), Xiangming Wen (Beijing University of Posts and Telecommunications, P.R. China)</td>
<td>52</td>
</tr>
<tr>
<td>Impact of Densification on Energy Efficiency in Wireless Access Networks</td>
<td>Sibel Tombaz (KTH Royal Institute of Technology, Sweden), Ki Won Sung (Royal Institute of Technology (KTH), Sweden), Jens Zander (KTH Royal Institute of Technology, Sweden)</td>
<td>57</td>
</tr>
<tr>
<td>A Genetic Algorithm Based Cell Switch-off Scheme for Energy Saving in Dense Cell Deployments</td>
<td>Furkan Alaca (Carleton University, Canada), Akram Bin Sediq (Carleton University, Canada), Halim Yanikomeroglu (Carleton University, Canada)</td>
<td>63</td>
</tr>
<tr>
<td>An energy efficient Polarization Modulation Scheme for Nonlinear Power Amplifier</td>
<td>Dong Wei (Beijing University of Posts and Telecommunications, P.R. China), Feng Chunyan (Beijing University of Posts and Telecommunications, P.R. China), Caili Guo (Beijing University of Posts and Telecommunications, P.R. China), Fangfang Liu (Beijing University of Posts and Telecommunications, P.R. China)</td>
<td>69</td>
</tr>
</tbody>
</table>

Multi-Antenna Systems

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Space-Time Block Codes for Two-User MIMO Interference Channels</td>
<td>Long Shi (University of New South Wales, Australia), Wei Zhang (The University of New South Wales, Australia), Xiang-Gen Xia (University of Delaware, USA)</td>
<td>75</td>
</tr>
<tr>
<td>Maximum SNR Transmit Filtering for Linear Equalization in Physical Layer Network Coding</td>
<td>Armin Schmidt (University of Erlangen-Nuernberg, Germany), Wolfgang Gerstacker (University of Erlangen-Nuernberg, Germany), Robert Schober (University of British Columbia, Canada)</td>
<td>80</td>
</tr>
<tr>
<td>Greedy Tomlinson-Harashima Precoding with Scheduling and Receiver Processing for Downlink MU-MIMO</td>
<td>Xinlei Wang (Zhejiang University, P.R. China), Yabo Li (Zhejiang University, P.R. China), Zhaoyang Zhang (Zhejiang University, P.R. China)</td>
<td>85</td>
</tr>
<tr>
<td>On The Secrecy Rate Region of a Fading Multiple-Antenna Gaussian Broadcast Channel with Confidential Messages and Partial CSIT</td>
<td>Pin-Hsun Lin (National Institute of Information and Communications Technology, Japan), Chien-Li Su (National Taiwan University, Taiwan), Hsuan-Jung Su (National Taiwan University, Taiwan)</td>
<td>90</td>
</tr>
<tr>
<td>Throughput Distribution Analysis of Return Link Multi-Gateway Interference Cancellation Strategies for Multi-Beam Broadband Satellite Systems</td>
<td>Francesco Lombardo (University of Bologna, Italy), Alessandro Vanelli-Coralli (University of Bologna, Italy), Enzo Alberto Candreva (University of Bologna, Italy), Giovanni Emanuele Corazza (University of Bologna, Italy)</td>
<td>95</td>
</tr>
</tbody>
</table>

Relays

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Practical Transmission Scheme for Half-Duplex Decode-and-Forward MIMO Relay Channels</td>
<td>Edwin Monroy (Seoul National University, Korea), Sunghyun Choi (Seoul National University, Korea), Bijan Jabbari (George Mason University, USA)</td>
<td>100</td>
</tr>
</tbody>
</table>
Noncoherent Relay Selection for Bidirectional Cooperative Networks
Mehdi Seyfi (Simon Fraser University, Canada), Sami Muhaidat (Khalifa University, UAE), Jie Liang (Simon Fraser University, Canada) .................................................................................................................. 105

On the Joint Scheduling and Intra-cell Interference Coordination in Multi-relay LTE Uplink
Irfan Ahmed (Taif University, Saudi Arabia), Amr Mohamed (Qatar University, Qatar) .................................................................................................................. 111

Performance of Hybrid-ARQ with Incremental Redundancy over Relay Channels
Ali Chelli (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia) .................................................................................................................. 116

Outage Probability of Decode-and-Forward Relaying System with Weibull Distributed Multiple Co-channel Interferences
Kwang-Sik Choi (Korea University, Korea), Hyun-Ho Lee (Korea University, Korea), Young-Chai Ko (Korea University, Korea) .................................................................................................................. 122

Resource Control

Analysis of Downlink Performance for Broadband Wireless Systems
Giovanni Giambene (University of Siena, Italy), Snezana Hadzic (University of Siena, Italy) .................................................................................................................. 128

Integrated CAC and Scheduling Cross-layer Algorithms in WiMAX Networks with Dynamic Polling Management
Marcio Andrey Teixeira (Federal Institute of Education, Science and Technology of Sào Paulo, Brazil), Paulo R. Guardieiro (Universidade Federal de Uberlandia, Brazil) .................................................................................................................. 134

Joint Scheduling for Dual-Hop Block-Fading Broadcast Channels
Ammar Zafar (King Abdullah University of Science and Technology, Saudi Arabia), Mohammad Shaqfeh (Texas A&M University at Qatar, Qatar), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Hussein Alnuweiri (Texas A&M University, Qatar) .................................................................................................................. 140

Efficiently Computable Bounds on the Rates Achieved by A Cross Layer Design with Binary Scheduling in Generic OFDMA Wireless Networks
Rozita Rashtchi (Carleton University, Canada), Ramy Gohary (Carleton University, Canada), Halim Yanikomeroglu (Carleton University, Canada) .................................................................................................................. 146

A Graph-based Approach for Distributed Parameter Coordination in Wireless Communication Networks
Igor Guerreiro (Universidade Federal do Ceará, Brazil), Dennis Hui (Ericsson Research, USA), Jiann-Ching Guey (ITRI, Taiwan), Charles Casimiro Cavalcante (Wireless Telecom Research Group - Federal University of Ceará, Brazil) .................................................................................................................. 152

Opportunistic and Cognitive Access

Cognitive Radios Methodology for Dynamic Spectrum Allocation in Broadband Wireless Cellular/Public Safety Network Systems
Chihkai Chen (University of California, Los Angeles, USA), Kung Yao (UCLA, USA) .................................................................................................................. 157

Iterative Power Allocation for Downlink Green Cognitive Radio Networks
Muhammad Naeem (Ryerson University, Canada), Kandasamy Illanko (Ryerson University, Canada), Ashok K Karmokar (Ryerson University, Canada), Alagan Anpalagan (Ryerson University, Canada), Muhammad Jaseemuddin (Ryerson University, Canada) .................................................................................................................. 163

Multi-Spectrum and Transmit-Antenna Switched Diversity Schemes for Spectrum Sharing Systems: A Performance Analysis
Mostafa Sayed (Varkon Semiconductors, Egypt), Mohamed M. Abdallah (Texas A&M University at Qatar, Qatar), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Khalid A. Qaraqe (Texas A&M University at Qatar, USA) .................................................................................................................. 168
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing-Throughput Tradeoff in Cooperative Spectrum Sensing</td>
<td>Mohsen Nader Tehrani (University of waterloo, Canada), Murat Uysal (Ozyegin University, Turkey)</td>
</tr>
<tr>
<td>Opportunistic Service Promotion for End-to-End Delay Minimization in IEEE 802.11p Vehicular Networks</td>
<td>Mohammad A Salahuddin (Western Michigan University, USA), Ala Al-Fuqaha (Western Michigan University, USA)</td>
</tr>
<tr>
<td>Beyond 4G Access</td>
<td></td>
</tr>
<tr>
<td>CloudMAC - An OpenFlow based Architecture for 802.11 MAC Layer Processing in the Cloud</td>
<td>Peter Dely (Karlstad University, Sweden), Jonathan Vestin (Karlstad University, Sweden), Andreas J. Kassler (Karlstad University, Sweden), Nico Bayer (Deutsche Telekom Laboratories, Germany), Hans Joachim Einsiedler (Deutsche Telekom, Berlin, Germany), Christoph Peylo (Deutsche Telekom Laboratories, Germany)</td>
</tr>
<tr>
<td>FS-FBMC: a flexible robust scheme for efficient multicarrier broadband wireless access</td>
<td>Maurice G. Bellanger (CNAM, France)</td>
</tr>
<tr>
<td>A Comparative Study of FBMC Prototype Filters in Doubly Dispersive Channels</td>
<td>Alphan Şahin (University of South Florida, USA), Ismail Güvenç (Florida International University, USA), Huseyin Arslan (University of South Florida, USA)</td>
</tr>
<tr>
<td>Space-Time Block Code Design for Asymmetric-OFDM Systems</td>
<td>Lin Luo (University of South Australia, Australia)</td>
</tr>
<tr>
<td>Optimizing Network Performance with Multihoming and Network Coding</td>
<td>Nelson Capela (Instituto de Telecomunicações Aveiro, Portugal), Susana Sargento (Instituto de Telecomunicações, Universidade de Aveiro, Portugal)</td>
</tr>
<tr>
<td>GC'12 Workshop - CACAO: GC'12 Workshop: International Workshop on Cloud Base-Station and Large-Scale Cooperative Communications</td>
<td></td>
</tr>
<tr>
<td>Exploiting Scalar Effects of MIMO Detection in Cloud Base-Station: Feasible Scheme and Universal Significance</td>
<td>Rongrong Qian (Beijing University of Posts and Telecommunications, P.R. China), Yuan Qi (Beijing University of Posts &amp; Telecommunications, P.R. China), Tao Peng (Beijing University of Posts &amp; Telecommunications, P.R. China), Wenbo Wang (Beijing University of Posts and Telecommunications, P.R. China), Duan Ran (China Mobile Research Institution, P.R. China), Chen Kuilin (China Mobile Research Institution, P.R. China)</td>
</tr>
<tr>
<td>Performance Evaluation of Cloud-RAN System with Carrier Frequency Offset</td>
<td>Jian Li (Huawei Technologies Co., Ltd., P.R. China), Dageng Chen (Huawei Technologies Co., Ltd., P.R. China), Yi Wang (Huawei Technologies Co., Ltd, P.R. China), Jianjun Wu (Huawei Technologies Co., Ltd., P.R. China)</td>
</tr>
<tr>
<td>Codebook Aided User Pairing and Resource Allocation for SC-FDMA</td>
<td>Michael A. Ruder (University of Erlangen-Nürnberg, Germany), Sebastian Heinrichs (Ulm University, Germany), Wolfgang Gerstacker (University of Erlangen-Nuernberg, Germany)</td>
</tr>
<tr>
<td>Network Massive MIMO for Cell-Boundary Users: From a Precoding Normalization Perspective</td>
<td>Changwoo Lee (Yonsei University, Korea), Chan-Byoung Chae (Yonsei University, Korea), Taehyung Kim (School of Electrical and Electronic Engineering, Yonsei University, Korea), Sooyong Choi (Yonsei University, Korea), Juho Lee (Samsung Electronics. Co., Ltd, Korea)</td>
</tr>
</tbody>
</table>
Architectures

Cloud Base Stations and Fixed Mobile Convergence for the Next Mobile Network
Wolfgang Kiess (DOCOMO Communications Laboratories Europe GmbH, Germany),
Changsoo Choi (DOCOMO Communications Laboratories Europe, Germany), Ashiq Khan (NTT DOCOMO, Inc., Germany), Kazuyuki Kozu (DOCOMO Communications Laboratories Europe GmbH, Germany) ......................................................... 238

A Backhaul Scheme for Uplink Cooperation among Base Stations
Zi Teng (Tongji University, P.R. China), Wenwen Cao (Tongji University, P.R. China), Jun Wu (Tongji University China, P.R. China) .................................................................................................................. 244

Pathloss Determination of Uplink Power Control for UL CoMP in Heterogeneous Network
Jiayin Zhang (Huawei Technologies Co., Ltd, P.R. China), Pablo Soldati (Huawei Technologies Sweden AB, Sweden), Yongming Liang (Huawei Technologies Co., Ltd., P.R. China), Lei Zhang (Huawei Technologies Co., Ltd, P.R. China), Chen Kuilin (China Mobile Research Institution, P.R. China) .............................................................................. 250

Large Scale MIMO Transmission Technology in the Architecture of Cloud Base-Station
Liping Rong (University of Electronic Science and Technology of China, P.R. China), Xin Su (Tsinghua University, P.R. China), Jie Zeng (Tsinghua University, P.R. China), Yujun Kuang (University of Electronic Science and Technology of China, P.R. China), Jingyu Li (Tsinghua University, P.R. China) .............................................................................. 255

Antenna and User Selection for a Cloud Base Station with (Reverse) Compute-and-Forward
SongNam Hong (University of Southern California, USA), Giuseppe Caire (University of Southern California, USA) ......................................................................................................................... 261

Platforms

Architecture of GPP based, scalable, large scale C-RAN BBU pool
Guangjie Li (Intel China, P.R. China), Chen Kuilin (China Mobile Research Institution, P.R. China), Senjie Zhang (Intel Labs China, P.R. China), Xuebin Yang (Intel China Research Center, P.R. China), Fanglan Liao (Intel Labs China, P.R. China), Tin-Fook Ngai (Intel, USA), Xu Zhang (Intel Labs China, P.R. China) .................................................................................. 267

Energy-Efficient User Association for Heterogenous Cloud Cellular Networks
Hang Zhu (Nanjing University, P.R. China), Shaowei Wang (Nanjing University, P.R. China), Dageng Chen (Huawei Technologies Co., Ltd., P.R. China) .................................................................................. 273

LTE eNodeB prototype based on GPP platform
Kai Niu (Beijing University of Posts and Telecommunications, P.R. China), Jianxing Sun (Beijing University of Posts and Telecommunications, P.R. China), Zhiqiang He (Beijing University of Posts and Telecommunications, P.R. China), Kok Keong (Michael) Chai (Queen Mary, University of London, United Kingdom) .................................................................................. 279

Automated Healing Approach in Cloud Base-Station with High Load using RRUs Cooperation
Li He (University of Electronic Science and Technology of China (UESTC), Chengdu, P.R. China), Xin Su (Tsinghua University, P.R. China), Jie Zeng (Tsinghua University, P.R. China), Yujun Kuang (University of Electronic Science and Technology of China, P.R. China) .................................................................................. 285

A Physical Layer Solution for Tomlinson-Harashima Precoding in the Framework of LTE-Advanced
Hua Yan (Huawei Technologies Co., Ltd, P.R. China), Tingjian Tian (Huawei Technologies Co., Ltd, P.R. China), Lei Chen (Huawei Technologies Co., Ltd, P.R. China), Jing Qiu (Huawei Tech. Co., Ltd, P.R. China) .................................................................................. 291

Algorithms II

Inter-Cell Antenna Calibration for Coherent Joint Transmission in TDD System
Hanqing Xu (Beijing, P.R. China), Yajun Zhao (ZTE, P.R. China), Linmei Mo (ZTE Corporation, P.R. China), Chen Huang (ZTE Corporation, P.R. China), Baoyu Sun ..... 297

Emerging Technologies for Smart Devices

**Smart Devices Fingerprint Detection**
Emilio Granell (Universitat Politècnica de València, Spain), Diana Bri (Universidad Politecnica de Valencia, Spain), Jesus Tomas (Polytechnic University of Valencia, Spain), Jaime Lloret (Universidad Politècnica de València, Spain)

**DSMIP and PMIP for Mobility Management of Heterogeneous Access Networks: Evaluation of Authentication Delay**
Paulo Roberto Gondim (Universidade de Brasilia, Brazil), José Trineto (Universidade de Brasilia, Brazil)

**Gyroscope Drift Correction Based on TDoA Technology in Support of Pedestrian Dead Reckoning**
Mohammed Elbes (Western Michigan University, USA), Ala Al-Fuqaha (Western Michigan University, USA), Ammar Rayes (Cisco / San Jose State University, USA)

**Goodies for Data: Game-based Data Propagation in DTNs**
Sebastian Schildt (TU Braunschweig, Germany), Lars C Wolf (Technische Universität Braunschweig, Germany)

**A Queuing-Based Delay-Tolerant Scheme for Energy Efficiency over Cognitive Radio Networks**
Bi Zhao (King’s College London, United Kingdom), Vasilis Friderikos (King’s College London, United Kingdom)

**Adaptive Coded Modulation for Nonlinear Fiber-Optical Channels**
Lotfollah Beygi (Chalmers University of Technology, Sweden), Erik Agrell (Chalmers University of Technology, Sweden), Magnus Karlsson (Chalmers University of Technology, Sweden)

**Versatile Low-Complex 16-QAM Optical Transmitter Driven by Binary Signals**
Francesco Fresi (Scuola Superiore Sant’Anna, Italy), Jonathan Klamkin (Sant’Anna School of Advanced Studies, Italy), Antonio Malacarne (CNIT, Italy), Luca Poti (Consorzio Nazionale Interuniversitario per le Telecomunicazioni, Italy)

**A Naturally-Inspired Algorithm for Routing, Wavelength Assignment, and Spectrum Allocation in Flexible Grid WDM Networks**
Ankitkumar Patel (NEC Laboratories America, Inc., USA), Philip N. Ji (NEC Laboratories America, Inc., USA), Jason P. Jue (University of Texas at Dallas, USA), Ting Wang (NEC Laboratories America, USA)

**Survivable Multipath Provisioning in OFDM-Based Flexible Optical Networks**
Nan Xiao (Iowa State University, USA), Lu Ruan (Iowa State University, USA)

GC’12 Workshop - FON: GC’12 Workshop: Flexible Optical Networks

**Morning Session 2**

**Adaptive Coded Modulation for Nonlinear Fiber-Optical Channels**
Lotfollah Beygi (Chalmers University of Technology, Sweden), Erik Agrell (Chalmers University of Technology, Sweden), Magnus Karlsson (Chalmers University of Technology, Sweden)

**Versatile Low-Complex 16-QAM Optical Transmitter Driven by Binary Signals**
Francesco Fresi (Scuola Superiore Sant’Anna, Italy), Jonathan Klamkin (Sant’Anna School of Advanced Studies, Italy), Antonio Malacarne (CNIT, Italy), Luca Poti (Consorzio Nazionale Interuniversitario per le Telecomunicazioni, Italy)

Morning Session 4

**A Naturally-Inspired Algorithm for Routing, Wavelength Assignment, and Spectrum Allocation in Flexible Grid WDM Networks**
Ankitkumar Patel (NEC Laboratories America, Inc., USA), Philip N. Ji (NEC Laboratories America, Inc., USA), Jason P. Jue (University of Texas at Dallas, USA), Ting Wang (NEC Laboratories America, USA)

**Survivable Multipath Provisioning in OFDM-Based Flexible Optical Networks**
Nan Xiao (Iowa State University, USA), Lu Ruan (Iowa State University, USA)

**Afternoon Session 1**

**Control Plane Techniques for Elastic Optical Networks: GMPLS/PCE vs OpenFlow**

302

308

314

320

326

331

336

340

346

352
Afternoon Session 2

Cost Evaluation for Flexible-Grid Optical Networks
Jorge López Vizcaíno (Huawei Technologies Duesseldorf GmbH, Germany), Yabin Ye (Huawei Technologies Duesseldorf GmbH, Germany), Victor López (Telefonica I+D, Spain), Felipe Jiménez (Telefónica I+D, Spain), Raúl Duque (Telefónica I+D, Spain), Peter Krummrich (TU Dortmund, Germany) ................................................................................................................. 358

Cost Analysis for Elastic Optical Networking: Single Channel vs. Multi Channels
Ming Xia (Ericsson Research US, USA), Stefan Dahlfort (Ericsson, Sweden) ........................................................................................................ 364

GC’12 Workshop - G-IoT: GC’12 Workshop: Green Internet of Things

On Green Management in IoT

Green Fleet Management Architecture: Application to Economic Itinerary Planning
Guillaume Rémy (Orange Labs, France), Sara Mehar (University of Bourgogne - ISAT Nevers, France), Tonino Sophy (University of Bourgogne - ISAT Nevers, France), Sidi-Mohammed Senouci (University of Bourgogne - ISAT Nevers, France), François Jan (Orange Labs, France), Yvon Gourhant (Orange Labs, France) ................................................................................................................. 369

Utilizing RFID-WSNs for Reducing the Footprint of the Oil Sands Industries
Ashraf E. Al-Fagih (Queen’s University, Canada), Ahmad El Kouche (Queen’s University, Canada), Sharief M.A. Oteafy (Queen’s University, Canada), Abdallah Alma’aaitah (Queen’s University, Canada) ................................................................................................................. 374

Moblist: A signal strength based clustering algorithm for ordered mobile scenarios
Victor Sucasas (Instituto de Telecomunicacions, Portugal), Ayman Radwan (Instituto de Telecomunicacions, Portugal), Hugo Marques (University of Aveiro, Greece), Jonathan Rodriguez (Instituto de Telecomunicacions, Portugal), Rahim Tafazolli (University of Surrey, United Kingdom) ................................................................................................................. 380

Data Management for The Internet of Things: Green Directions
Najah A. Abu Ali (UAEU, UAE), Mervat Abu-Elkheir (Queen’s, Canada) ................................................................................................................. 386

Energy-aware Protocols in Green-IoT

Energy-Efficient Device-to-Device Communications in LTE Public Safety Networks
Elias Yaacoub (Qatar Mobility Innovations Center (QMIC), Qatar), Osama Kubbar (QU Wireless Innovation Centre, Qatar) ................................................................................................................. 391

Starting from Green: Energy-Centric Transformation of Smart Object Architectures
Paul G. Flikkema (Northern Arizona University, USA), Kenji Yamamoto (BluePlasma Engineering, USA), Samuel Boegli (Northern Arizona University, USA) ................................................................................................................. 396

Energy Efficient CoMP Transmission in LTE-Advanced
Kazi Mohammed Saidul Huq (Institute of Telecommunications, Portugal), Shahid Mumtaz (Institute of Telecommunications, Portugal), Muhammad Alam (Institute of Telecommunications, Portugal), Ayman Radwan (Instituto de Telecomunicacions, Portugal), Jonathan Rodriguez (Instituto de Telecomunicacions, Portugal) ................................................................................................................. 401

Energy Aware Opportunistic Routing in Wireless Sensor Networks
Petros Spachos (University of Toronto, Canada), Periklis Chatzimisios (Alexander TEI of Thessaloniki, Greece), Dimitrios Hatzinakos (University of Toronto, Canada) .................................................................................................................. 405

Algorithms and Bounds for Energy-based Multi-source Localization in Log-normal Fading
.................................................................................................................. 410
Heterogeneous Networks Designs and Optimizations

A Distance-dependent Mode Selection Algorithm in Heterogeneous D2D and IMT-Advanced Network
Shang Xiang (Beijing University of Posts and Telecommunications, P.R. China), Tao Peng (Beijing University of Posts & Telecommunications, P.R. China), Ziyang Liu (Beijing University of Post and Telecommunication, P.R. China), Wenbo Wang (Beijing University of Posts and Telecommunications, P.R. China) 416

Heterogeneous LTE/802.11a Mobile Relays for Data Rate Enhancement and Energy-Efficiency in High Speed Trains
Rachad Atat (King Abdullah University of Science and Technology, Saudi Arabia), Elias Yaacoub (Qatar Mobility Innovations Center (QMIC), Qatar), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Adnan Abu-Dayya (QMIC, Qatar) 421

Improved Mobility Performance in LTE Co-Channel HetNets Through Speed Differentiated Enhancements
Simone Barbera (Aalborg University, Denmark), Per Henrik Michaelsen (Nokia Siemens Networks, Denmark), Mikko Säily (Nokia Siemens Networks, Finland), Klaus Pedersen (Nokia Siemens Networks, Denmark) 426

Multi-access and Cooperative Relays

In-Network Area Estimation and Localization in Wireless Sensor Networks
Nabanita Das (Indian Statistical Institute, India), Srabani Kundu (Guru Nanak Institute of Technology, Kolkata, India) 431

Handling Randomness of Multi-Class Random Access Loads in LTE-Advanced Network
Ki-Dong Lee (LG Electronics Mobile Research, USA) 436

On the Exact Capacity of Dual-Hop AF Relaying With Adaptive Channel Inversion
Samy S. Soliman (University of Alberta, Canada), Norman C. Beaulieu (University of Alberta, Canada) 441

Dual-Hop AF Relaying Systems in Mixed Nakagami-m and Rician Links
Samy S. Soliman (University of Alberta, Canada), Norman C. Beaulieu (University of Alberta, Canada) 447

QoS Issues

Role-based Quality of Service for Web Services
Frank T. Johnsen (Norwegian Defence Research Establishment (FFI), Norway), Trude H Bloebaum (Norwegian Defence Research Establishment (FFI), Norway), Jørgen Nordmoen (NTNU, Norway) 453

Delay Performance of Opportunistic Network Coding for a Bidirectional Relaying Link
Hadi Meshgi (McMaster University, Canada), Dongmei Zhao (McMaster University, Canada) 459

A Reputation based Vertical Handover Decision making Framework (R-VHDF)
464
Geolocation Assisted Network Routing

Weighted Signed Graph (WSG) Power-aware Routing in Distributed Wireless Networks
Hemant Kumar Rath (Tata Consultancy Services, India), Akash Chaturvedi (IIT Patna, India), Rajan Ma (Tata Consultancy Services, India), Anantha Simha (Tata Consultancy Services, India) ................................................................. 475

A Novel Device and Application-Aware Energy Efficient Routing Algorithm for WLANs
Ruiqi Ding (Dublin City University, Ireland), Gabriel-Miro Muntean (Dublin City University, Ireland) ................................................................. 481

Inter-MAC Green Path selection for Heterogeneous Networks
Olivier Bouchet (France Télécom, Orange Labs, France), Abdesselem Kortebi (France Telecom, Orange Labs, France), Mathieu Boucher (Neo-Soft, France) ................................................................. 487

Available Bandwidth Probing for Path Selection in Heterogeneous Home Networks
Oscar Olvera-Irigoyen (Orange Labs, France), Abdesselem Kortebi (France Telecom, Orange Labs, France), Laurent Toutain (Telecom Bretagne, France) ................................................................. 492

Geolocation Assisted Network Routing (II)

A Novel Insight Into Beaconless Geo-Routing
Ahmed Bader (Telecom Paris Tech, France), Karim Abed-Merai (Dept TSI, Télécom Paris, France), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia) ................................................................. 498

Network Coding Based Geographical Opportunistic Routing for Ad Hoc Cognitive Radio Networks
Xing Tang (City University of Hong Kong, Hong Kong) ................................................................. 503

A Cross-Layer Routing Protocol with Quality of Service Support for Flexible Deployment in MANETs
Giovanni Rigazzi (University of L' Aquila, Italy), Veronica Palma (University of ROMA TRE, Italy), Gabriele Tamea (Università di Roma "La Sapienza", Italy), Fortunato Santucci (University of l'Aquila, Italy), Alessandro Neri (University of ROMA TRE, Italy) ................................................................. 508

Heterogeneous Networks Designs and Optimizations (II)

A Dynamic Network Gateway Selection Scheme Based on Autonomous Clustering for Heterogeneous Mobile Ad Hoc Network Environment
Keisei Okano (Hiroshima City University, Japan), Tomoyuki Ohta (Hiroshima City University, Japan), Yoshiaki Kakuda (Hiroshima City University, Japan) ................................................................. 513

Secrecy Broadcast Transmission Capacity for Heterogeneous Correlated Wireless Ad Hoc Networks
Xiaohui Sun (Beijing University of Posts and Telecommunications, P.R. China), Changchuan Yin (Beijing University of Posts and Telecommunications, P.R. China), Yang Liu (Beijing University of Posts and Telecommunications, P.R. China), Jing Gao (Beijing Key Laboratory of Beijing University of Posts and Telecommunications, P.R. China) ................................................................. 518

An Energy Efficient Clustering in Heterogeneous Wireless Sensor and Actuators Networks
Dong Sung Kim (Kumoh National Institute of Technology, Korea), Quang Pham (Kumoh National Institute of Technology, Korea) ................................................................. 524
Energy Efficiency

Area Green Efficiency (AGE) of Two Tier Heterogeneous Cellular Networks
Hina Tabassum (KAUST, Saudi Arabia), Muhammad Zeeshan Shakir (Texas A&M University at Qatar (TAMUQ), Qatar), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia) ................................................................. 529

Energy-Efficient Power Allocation with Dual-Utility in Two-Tier OFDMA Femtocell Networks
Wei Li (Beijing University of Posts and Telecommunications, P.R. China), Haijun Zhang (Centre for Telecommunications Research, King's College London, United Kingdom), Wei Zheng (BUPT, P.R. China), Tao Su (Beijing University of Posts and Telecommunications, P.R. China), Xiangming Wen (Beijing University of Posts and Telecommunications, P.R. China) .................................................................................. 535

Determining the Energy Efficiency of Femtocell Basestations with Multiple Antennas
David Stuart Muirhead (University of Surrey, United Kingdom), Muhammad Ali Imran (University of Surrey, United Kingdom) .......................................................................................................................... 541

Multiple Antenna Techniques

Multiuser MIMO in Distributed Antenna Systems with Limited Feedback
Stefan Schwarz (University of Technology, Austria), Robert Heath (The University of Texas at Austin, USA), Markus Rupp (Vienna University of Technology, Austria) .......................................................................................................................... 546

Interference Mitigation and Capacity Optimization in Cooperative Public Femtocell Networks with Cognitive Enabled Multi-element Antennas
Shi Chen (Beijing University of Posts and Telecommunications, P.R. China), Zhiyong Feng (Beijing University of Posts and Telecommunications, P.R. China), Qixun Zhang (Beijing University of Posts and Telecommunications, P.R. China), Ping Zhang (WTI-BUPT, P.R. China) .......................................................................................................................... 552

Impact of Pattern Reconfigurable Antennas on Interference Alignment Over Measured Channels
Rohit Bahl (University of Pennsylvania, USA), Nikhil Gulati (Drexel University, USA), Kapil Dandekar (Drexel University, USA), Dwight Jaggard (University of Pennsylvania, USA) .......................................................................................................................... 557

Performance Analysis & Measurements

Heterogeneous Cellular Network Performance Analysis under Open and Closed Access
Prasanna Madhusudhanan (University of Colorado at Boulder, USA), Juan Restrepo (University of Colorado at Boulder, USA), Youjian (Eugene) Eugene Liu (University of Colorado at Boulder, USA), Timothy Brown (University of Colorado, USA) .......................................................................................................................... 563

Shared Access Protocol (SAP) in Femtocell Channel Resources for Cellular Coverage Enhancement
Amer M Magableh (Jordan University of Science and Technology, Jordan), Redha M Radaydeh (Alfaisal University, Saudi Arabia), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia) .......................................................................................................................... 569

Performance Comparison of Fixed and Moving Relays under Co-channel Interference..................574
Yutao Sui (Chalmers University of Technology, Sweden), Agisilaos Papadogiannis (Chalmers University of Technology, Sweden), Wei Yang (Chalmers University of Technology, Sweden), Tommy Svensson (Chalmers University of Technology, Sweden)

Radio Signal Propagation and Attenuation Measurements for Modern Residential Buildings
.......................................................................................................................... 580
Self Organization and Dynamic Operation

**Dynamic TDD support in the LTE-B enhanced Local Area architecture**
Bo Yu (Colorado State University, USA), Sayandeep Mukherjee (DOCOMO Innovations Inc., USA), Hiroyuki Ishii (DOCOMO Innovations, Inc, Japan), Liuqing Yang (Colorado State University, USA) ............................................. 585

**Self-organized Uplink Power Control in LTE Heterogeneous Networks**
Yuanye Wang (Powerwave Technologies, USA), Shankar Venkatraman (Powerwave Technologies, USA) ....................................................................................................................... 592

**Distributed Bayesian Pricing for Sum-Rate Maximization in Small-Cell Networks**
Alessandro Carfagna (University of Rome "La Sapienza", Italy), Sergio Barbarossa (University of Rome, Italy) ...................................................................................................................... 598

**Coordinated Beam Selection in LTE-Advanced HetNets: A Reinforcement Learning Approach**
Meryem Simsek (University of Duisburg-Essen, Germany), Mehdi Bennis (Centre of Wireless Communications, University of Oulu, Finland), Andreas Czyliwik (Universität Duisburg-Essen, Germany) ................................................. 603


**Network Advancement Techniques**

**Coordinated Multi Point Transmission in 3GPP LTE Heterogeneous Networks**
Stefan Geirhofer (Qualcomm, Inc., USA), Peter Gaal (Qualcomm, USA) .......................................................... 608

**B4G local area: high level requirements and system design**
Preben Mogensen (Nokia Siemens Networks, Aalborg, Denmark), Kari Pajukoski (Nokia-Siemens Networks, Finland), Bernhard Raa (Nokia Siemens Networks, Germany), Esa Tirola (Nokia Siemens Networks, Finland), Eeva Lähetkangas (Nokia Siemens Networks, Finland), Istvan Z. Kovács (Nokia Siemens Networks, Denmark), Gilberto Berardinelli (Aalborg University, Denmark), Luis Garcia (Aalborg University, Denmark), Liang Hu (Aalborg University & NTT DOCOMO Eurolab, Denmark), Andrea F. Cattoni (Aalborg University, Denmark) ........................................... 613

**Utility-Based Radio Link Assignment in Multi-Radio Heterogeneous Network**
Ali Y Panah (Intel Corp., USA), Shu-ping Yeh (Intel Corporation, USA), Nageen Himayat (Intel Corporation, USA), Shilpa Talwar (Intel, USA) .............................................................. 618

**A Novel Architecture for LTE-B - C-plane/U-plane Split and Phantom Cell Concept**
Hiroyuki Ishii (DOCOMO Innovations, Inc, Japan), Yoshihisa Kishiyama (NTT DOCOMO, INC., Japan), Hideaki Takahashi (NTT DOCOMO, Inc., Japan) ...................................................... 624

**Coverage Extension Techniques**

On the Peak-to-Average Power Ratio of Pre-Equalized Base-Field Hartley OFDM
Lin Luo (University of South Australia, Australia), Chung Shue Chen (Alcatel-Lucent Bell Labs, France), Siu-Wai Ho (University of South Australia, Australia) .......................................................... 631

**Analytical Performance Evaluation of Base Station Cooperation Systems Using SC-FDE Modulations with Iterative Receivers**
Filipe Casal Ribeiro (ISCTE-IUL, Portugal), Rui Dinis (Instituto de Telecomunicações/UNINOVA/FCT-UNL, Portugal), Francisco Cercas (ISCTE-IUL, Portugal), Adão Silva (Instituto de Telecomunicações (IT)/University of Aveiro, Portugal) ........................................................... 637
Cell Capacity Enhancement Techniques (Interference Control)

Feedback Schemes for Dynamic Cooperation among Multiple Transmission Points in LTE-Advanced Networks
Hyojin Lee (Samsung, Korea), Younsun Kim (University of Washington, USA), Juho Lee (Samsung Electronics. Co., Ltd, Korea) ................................................................. 648

Throughput Optimization in MU-MIMO Systems via Exploiting the BS Antenna Tilt
Nima Seifi (Chalmers University of Technology, Sweden), Mikael Coldrey (Ericsson Research, Sweden), Tommy Svensson (Chalmers University of Technology, Sweden) ................................................................. 653

Interference Robustness for MIMO Networks --- System-Level Performance Evaluation for LTE-Advanced
Jan Ellenbeck (Technische Universität München, Germany), Andreas Dotzler (Technische Universität München, Germany), Wolfgang Utschick (Technische Universität München, Germany) ................................................................. 658

Heterogeneous Networks Techniques

Optimized Green Operation of LTE Networks in the Presence of Multiple Electricity Providers
Hakim Ghazzai (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Elias Yaacoub (Qatar Mobility Innovations Center (QMIC), Qatar), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Adnan Abu-Dayya (QMIC, Qatar) ................................................................. 664

QoS-Aware Multi-RAT Resource Allocation with Minimum Transmit Power in Multiuser OFDM System
Mohamed Fadel (University of Texas at Dallas, USA), Ahmed S. Ibrahim (Cairo University and Intel Corporation, Egypt), Hani Elgebaly (Intel, USA) ................................................................. 670

Power Control Based on Interference Pricing in D2D/Cellular Networks
Fei Teng (Northwestern University, USA), Dongning Guo (Northwestern University, USA), Michael Honig (Northwestern University, USA), Jialing Liu (Huawei, USA), Weimin Xiao (Huawei, USA) ................................................................. 676

A New Fountain Decoder Escaping Almost All Absorbing Sets
Masoud Mir Rezaei (Queen's University, Canada), Shahram Yousefi (Queen's University, Canada) ................................................................. 681

Advanced Antenna Techniques

A New Approach to Beamformer Design for Massive MIMO Systems Based on k-Regularity
Gilwon Lee (KAIST, Korea), Juho Park (KAIST, Korea), Youngchul Sung (KAIST, Korea), Junyeong Seo (KAIST, Korea) ................................................................. 686

Fulfilling the Promise of Massive MIMO with 2D Active Antenna Array
Boon Loong Ng (Samsung Telecommunications America, USA), Yoonsun Kim (University of Washington, USA), Juho Lee (Samsung Electronics. Co., Ltd, Korea), Yang Li (University of Texas at Dallas, USA), Young-Han Nam (Samsung Telecommunications America, USA), Jianzhong Zhang (Samsung Telecommunications America, USA), Krishna Sayana (Samsung Telecommunications America, USA) ................................................................. 691

A Dual-polarized Antenna based Sensing Algorithm for OFDM Signals in LTE-Advanced Systems
_________________________________________________________________________________________ 697
Lin Lin (Beijing University of Posts and Telecommunications, P.R. China), Caili Guo (Beijing University of Posts and Telecommunications, P.R. China), Feng Chunyan (Beijing University of Posts and Telecommunications, P.R. China), Xiaobin Wu (Beijing University of Posts and Telecommunications, P.R. China)

Low Complexity Direction of Arrival (DoA) Estimation for 2D Massive MIMO Systems
Anding Wang (Zhejiang Gongshang University, P.R. China), Lingjia Liu (University of Kansas, USA), Jianzhong Zhang (Samsung Telecommunications America, USA) 703


Energy Efficiency in Cloud Environments

Inter-and-Intra Data Center VM-Placement for Energy-Efficient Large-Scale Cloud Systems
Burak Kantarci (University of Ottawa, Canada), Luca Foschini (University of Bologna, Italy), Antonio Corradi (University of Bologna, Italy), Hussein T Mouftah (University of Ottawa, Canada) 708

Services in Cloud Environments

Reducing Power Consumption in Embedding Virtual Infrastructures
Bin Wang (Beijing Jiaotong University, P.R. China), Xiaolin Chang (Beijing Jiaotong University, P.R. China), Jiqiang Liu (Beijing Jiaotong University, P.R. China), Jogesh K. Muppala (Hong Kong University of Science and Technology, Hong Kong) 714

OpenADN: Mobile Apps on Global Clouds Using OpenFlow and Software Defined Networking
Subharthi Paul (Washington University in St. Louis, USA), Raj Jain (Washington University in St. Louis, USA) 719

An Approach to Identify and Monitor SLA Parameters for Storage-as-a-Service Cloud Delivery Model
Nirnay Ghosh (Indian Institute of Technology, India), Soumya K. Ghosh (Indian Institute of Technology, Kharagpur, India) 724

Risk Propagation of Security SLAs in the Cloud
Matt Hale (University of Tulsa, USA), Rose Gamble (University of Tulsa, USA) 730

Internet Traffic Classification based on bag-of-words model
Yin Zhang (Shanghai Jiaotong University, P.R. China), Yi Zhou (Shanghai Jiaotong University, P.R. China), Kai Chen (Shanghai Jiao Tong University, P.R. China) 736

Multiocular Surveillance of Wide Dynamic Environments Based on Optical Vision, Event Modelling and End-to-End Data Encryption A cloud-based monitoring approach of maritime activities
Klimis Ntalianis (National Technical University of Athens, Greece), Emmanuel S. Sardis (National Technical University of Athens - NTUA, Greece), Nicolas Tsapatsoulis (Cyprus University of Technology, Cyprus), Anastasios D. Doulamis (National Technical University of Athens, Greece), Panagiotis Rizomiliotis (University of the Aegean, Greece) 742

Media Streaming in Cloud Environments

Experimental Evaluation of Linux TCP for Adaptive Video Streaming over the Cloud Rafael Alvarez-Horine (San Jose State University, USA), Melody Moh (San Jose State University, USA) 747

Prediction-based Resource Allocation in Clouds for Media Streaming Applications
Amr Alasaad (The University of British Columbia, Canada), Kaye Shafiee (The University of British Columbia, Canada), Sathish Gopalakrishnan (University of 753
Security and Trust in the Cloud

A Novel Architecture for a Computer Network Defense (CND) System Using Content Addressable Networks (CAN)
Derar Khalaf Al-Omari (Illinois Institute of Technology, USA), Vijay Gurbani (Bell Laboratories, Alcatel-Lucent, USA), Tricha Anjali (Illinois Institute of Technology, USA) ................................................................. 758

Platform Capability Based Identity Management for Scalable and Secure Cloud Service Access
Abhilasha Bhargav (Intel Corporation, USA), Steve Deutsch (Intel, USA) ........................................................................................................ 763

Incorporating Hardware Trust Mechanisms in Apache Hadoop
Jason C Cohen (Towson University, USA), Subrata Acharya (Towson University, USA) .......................................................................................... 769

Digital Forensics in the Cloud Computing Era
Nikolaos Marangos (University of the Aegean, Greece), Panagiotis Rizomiliotis (University of the Aegean, Greece), Lilian Mitrou (University of the Aegean, Greece) ................................................................. 775


Management of P2P Networks, Wireless and Heterogeneous Networks

Secure Web Framework For Mobile Devices
Muneer Malik (University of Cincinnati, USA), Dharma P Agrawal (University of Cincinnati, USA) ........................................................................ 781

Mobility Management Issues in Heterogeneous Mobile Wireless Networks
Leo Bhebhe (Nokia Siemens Networks, Finland) ...................................................................................................................... 787

A new algorithm of virtual network embedding based on minimum node stress and adjacent principle
Hongyan Cui (Beijing University of Posts and Telecommunications, Wireless Technology Innovation Labs, P.R. China), Fangjie Kong (Beijing University of Posts and Telecommunications, P.R. China), Yunjie Liu (Beijing University of Posts and Telecommunications, P.R. China) ................................................................ 792

An Adaptive Source Rate Regulation Scheme for Wireless Periodical Data Collection Systems
Yusuke Matsuda (Niigata University, Japan), Kenichi Mase (Niigata University, Japan) .......................................................................................... 797

Management of Future Internet

A Policy based Framework for governing Future Networks
Aristi Galani (University of Piraeus, Greece), Nikos Koutsouris (University of Piraeus, Greece), Kostas Tsagkaris (University of Piraeus, Greece), Panagiotis Demestichas (University of Piraeus, Greece), Beatriz Fuentes (Telefónica ID, Spain), Carolina Vazquez (Telefonica ID, Spain), Gerard Nguengang (Thales Communications & Security SA, France) ......................................................................................... 802

Auto-Collaboration for Optimal Network Resource Utilization in Fixed IPv6 Networks................. 807
Nikolay Tcholtchev (FOKUS Fraunhofer Institute for Open Communication Systems, Germany), Arun Prakash (Fraunhofer FOKUS, Germany), Ina K Schieferdecker (TU Berlin/Fraunhofer FOKUS, Germany), Ranganal Chopardarada (IPv6 Forum, Germany), Razvan Petre (Testing Technologies IST GmbH, Germany)

Performance Evaluation of LTE EPC Self-Healing Solutions .......................................................................................................................... 813
Management of P2P Networks, Wireless and Heterogeneous Networks

Autonomicity Design in Openflow Based Software Defined Networking
Wang Wendong (Beijing University of Posts and Telecommunications, P.R. China), Yannan Hu (Beijing University of Posts and Telecommunications, P.R. China), Xirong Que (Institute of Networking Technology, P.R. China), Gong Xiangyang (Beijing University of Posts and Telecommunications P.R. China, P.R. China)

Management of Future Internet

Construction and Evaluation of a Regional Protection System Employing Power-saving Wireless Terminals without Using GPS Modules
Hiroaki Nose (Nagano Prefectural Institute of Technology, Japan), Hideki Motoyama (Nagano Japan Radio Co., Ltd., Japan), Hikofumi Suzuki (Shinshu University, Japan), Yasushi Fuwa (Shinshu University, Japan)

Multiplatform Management of a Hard Real-Time Ethernet Switch
Aleksander Pleszko (University of Aveiro, Portugal), João Paulo Barraca (University of Aveiro, Portugal), Joaquim Ferreira (University of Aveiro, Portugal), Pedro A. Gonçalves (Universidade de Aveiro, Portugal)

A Novel Cognitive Management Scheme for the Virtual Network Resources
Yanni Han (Institute of Acoustics, Chinese Academy of Sciences, P.R. China), Zihou Wang (Institute of Acoustics, Chinese Academy of Sciences, P.R. China), Hui Tang (Chinese Academy of Sciences, P.R. China), Song Ci (University of Nebraska-Lincoln, USA)

Link Sleeping Optimization for Green Virtual Network Infrastructures
Ebrahim Ghaizaeedi (University of Surrey, United Kingdom), Ning Wang (University of Surrey, United Kingdom), Rahim Tafazolli (University of Surrey, United Kingdom)

Standardization of an Autonomicity-Enabled Mesh Architecture Framework, from ETSI-AFI Group perspective: Work in Progress (Part 1 of 2)
Szymon Szott (AGH University of Science and Technology, Poland), Michal Wodczak (Ericsson / Telcordia, Poland), Ranganai Chaparadza (IPv6 Forum, Germany), Tayeb Ben Meriem (Orange, France), Costas Tsagkaris (University of Piraeus, Greece), Apostolos Kousaridas (University of Athens, Greece), Benoit Radier (Orange France Telecom R&D, France), Andrej Mihailovic (King’s College London, United Kingdom), Marek Natkaniec (AGH University of Science and Technology, Poland), Krzysztof Loziak (AGH University of Science and Technology, Poland), Katarzyna Kosek-Szott (AGH University of Science and Technology, Poland), Michal Wagrowski (AGH University of Science and Technology, Poland)

Standardization of an Autonomicity-Enabled Mesh Architecture Framework, from ETSI-AFI Group perspective: Work in Progress (Part 2 of 2)
Szymon Szott (AGH University of Science and Technology, Poland), Michal Wodczak (Ericsson / Telcordia, Poland), Ranganai Chaparadza (IPv6 Forum, Germany), Tayeb Ben Meriem (Orange, France), Costas Tsagkaris (University of Piraeus, Greece), Apostolos Kousaridas (University of Athens, Greece), Benoit Radier (Orange France Telecom R&D, France), Andrej Mihailovic (King’s College London, United Kingdom), Marek Natkaniec (AGH University of Science and Technology, Poland), Krzysztof Loziak (AGH University of Science and Technology, Poland), Katarzyna Kosek-Szott (AGH University of Science and Technology, Poland), Michal Wagrowski (AGH University of Science and Technology, Poland)

Preventive Network Protection in Probabilistic Large-Scale Failure Scenarios
Alireza Izaddoost (University of Ontario Institute of Technology, Canada), Shahram Shah Heydari (University of Ontario Institute of Technology, Canada)
QoS for emerging networks

**Column Generation Approach for One-Shot Virtual Network Embedding**
Abdallah Jarray (University of Ottawa, Canada), Ahmed Karmouch (University of Ottawa, Canada) ................................................................. 863

**Multi-Granular Optical Transport Network Design with Dual Power State**
Nabil A Naas (University of Ottawa, Canada), Burak Kantarci (University of Ottawa, Canada), Hussein T Mouftah (University of Ottawa, Canada) .................................................. 869

**Network Construction Management for Emergency Communication System SKYMESH in Large Scale Disaster**
Hiraku Okada (Nagoya University, Japan), Hironori Oka (Niigata University, Japan), Kenichi Mase (Niigata University, Japan) .......................................................................................... 875

**Throughput Enhancement for VHT WLANs Based on Two Level Network Allocation Vector**
Baofeng Ji (Southeast University, P.R. China), Kang Song (Southeast University, P.R. China), Chungen Li (Southeast University, P.R. China), Yongming Huang (Southeast University, P.R. China), Yang Luxi (Southeast University, P.R. China) .............................................................. 881

**Fuzzy Non-dominance multipath link-state routing framework for network routing management with inaccurate information**
Jing An (King's College London, United Kingdom), Paul Pangalos (Kings College London, United Kingdom), Hamid Aghvami (King's College London, United Kingdom) .......................................................... 886

Autonomic Networking, Cognitive Networking, and Self-Management

**Rotary Dial Model - A Model-Driven Methodology for Autonomic Network Design**
Arun Prakash (Fraunhofer FOKUS, Germany), Ina K Schieferdecker (TU Berlin/Fraunhofer FOKUS, Germany), Michael Wagner (Fraunhofer FOKUS, Germany), Christian Hein (Fraunhofer Fokus, Germany) .................................................................................. 891

**The Self-Growing Concept as a Design Principle of Cognitive Self-Organization**
Marc Emmelmann (Fraunhofer FOKUS, Germany), Bernd Bochow (Fraunhofer FOKUS, Germany), Athanasios Makris (National and Kapodistrian University of Athens, Greece), Alexandros Kaloxyllos (University of Peloponnisos, Greece), Georgios P. Koudouridis (Huawei Technologies Sweden R&D Center, Sweden) ................................................................. 897

**Testbed Implementation for Autonomic Network Performance Management of Wireless Mesh Networks**
Abdelhamid G Moursy (University of Louisiana at Lafayette, USA), Ahmed Aly (University of Louisiana at Lafayette, USA), Bide Xu (University of Louisiana at Lafayette, USA), Dmitri Perkins (University of Louisiana at Lafayette, USA), Magdy Bayoumi (University of Louisiana, USA) .................................................................................. 903

**Autonomic Cooperative Networking for Emergency Communications**
Michal Wodczak (Ericsson / Telcordia, Poland) .......................................................................................... 908

**GARSON: Management Performance Aware Approach to Autonomic and Cognitive Networks**
Sławomir Kułkiński (Warsaw University of Technology, Poland), Mariusz Skrocki (Orange Labs Poland, Poland), Lukasz Rajewski (Orange Labs Poland, Poland), Joan Meseguer Llopis (Orange Labs Poland, Poland), Zygmun Wereszczyński (Orange Labs Poland, Poland) .................................................................................. 914

**A Game Theory Approach: Dynamic Behaviours for Spectrum Management in Cognitive Radio Network**
Saed Alrabae (Concordia University, Canada), Mahmoud Khasawneh (Concordia University, Canada), Anjali Agarwal (Concordia University, Canada), Nishith Goel (Cistel, Canada), Marzio Zaman (Cistel Technology Inc., Canada) .................................................................................. 919

**Ad Hoc Networking with MIMO and Cognitive Radio**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary and Secondary Nodes Coexistence through Opportunistic MIMO Cognitive Radio</strong></td>
<td>Mauro Biagi (Sapienza University of Rome, Italy), Francesca Cuomo (University of Rome Sapienza, Italy)</td>
<td>925</td>
</tr>
<tr>
<td><strong>A Combinatorial Solution for Scheduling Spatial Multiplexing in MIMO-Based Ad Hoc Networks</strong></td>
<td>Maggie Cheng (Missouri University of Science and Technology, USA), Quanmin Ye (Missouri University of Science and Technology, USA)</td>
<td>931</td>
</tr>
<tr>
<td><strong>BAR: Bandwidth-Aware Opportunistic Localized-Routing for Cognitive Radio Networks</strong></td>
<td>Tung Le (Kumoh National Institute of Technology, Korea), Quang Pham (Kumoh National Institute of Technology, Korea), Soo Young Shin (Kumoh National Institute of Technology, Korea), Dong Sung Kim (Kumoh National Institute of Technology, Korea)</td>
<td>937</td>
</tr>
<tr>
<td><strong>Predictive Spectrum Decision Mechanisms in Cognitive Radio Networks</strong></td>
<td>Gulnur Selda Uyanik (Istanbul Technical University, Turkey), Berk Canberk (Istanbul Technical University, Turkey), Sema Oktug (Istanbul Technical University, Turkey)</td>
<td>943</td>
</tr>
<tr>
<td><strong>AJIM: A Transparent Cognitive Anti-Jamming and Interference Mitigation Framework</strong></td>
<td>Kyriakos Manousakis (Telcordia Technologies, USA), John Sucec (Applied Communication Sciences, USA), Mariusz A Fecko (Applied Communication Sciences (ACS), USA), Kenneth Young (Applied Communication Sciences, USA)</td>
<td>948</td>
</tr>
<tr>
<td><strong>Spectrum Utility Optimization by Priced Timed Automata Model under Heterogeneous Primary User Traffics in CR Networks</strong></td>
<td>Berk Canberk (Istanbul Technical University, Turkey), Tolga Ovatman (Istanbul Technical University Faculty of Electrical and Electronic Engineering, Turkey)</td>
<td>953</td>
</tr>
<tr>
<td><strong>Wireless MIMO Switching: Distributed Zero-Forcing Relaying Using Network Coding</strong></td>
<td>Miao Wang (Beijing Jiaotong University, P.R. China), Fanggang Wang (Beijing Jiaotong University, P.R. China), Zhangdui Zhong (Beijing Jiaotong University, P.R. China)</td>
<td>959</td>
</tr>
<tr>
<td><strong>Cooperative Spectrum Sharing with Bi-directional Secondary Transmissions</strong></td>
<td>Yiyang Pei (Institute for Infocomm Research, Singapore), Ying-Chang Liang (Institute for Infocomm Research, Singapore)</td>
<td>964</td>
</tr>
<tr>
<td><strong>Favor-Aware Distributed Spectrum Allocation via Compressive Skycube Query</strong></td>
<td>Lixia Liu (National University of Defense Technology, P.R. China), Hu Gang (National University of Defense Technology, P.R. China), Ming Xu (National University of Defense Technology, P.R. China), Peng Yuxing (NUDT, P.R. China)</td>
<td>969</td>
</tr>
<tr>
<td><strong>Routing and Resource Allocation with Collision Constraint in Multi-hop Cognitive Radio Networks</strong></td>
<td>Liren Lai (Zhejiang University, P.R. China), Jian Wang (Zhejiang University, P.R. China), Aiping Huang (Zhejiang University, P.R. China), Hangguan Shan (Zhejiang University, P.R. China)</td>
<td>974</td>
</tr>
<tr>
<td><strong>Bio-Inspired Time Synchronization for Cognitive Radio Ad Hoc Networks</strong></td>
<td>Nadine Pari (Federal University of Parana, Brazil), Aravind Kailas (University of North Carolina at Charlotte, USA), Michele Nogueira (Federal University of Parana, Brazil)</td>
<td>980</td>
</tr>
</tbody>
</table>
MobiSession1

**Maintaining Strong Consistency for the Identifier-to-Locator Mapping Cache**  
Xiaoqian Li (Beijing Jiaotong University, P.R. China), Feng Qiu (beijing jiaotong university IP network laboratory, P.R. China), Huachun Zhou (Beijing Jiaotong University, P.R. China), Zhang Hongke (Beijing Jiaotong University, P.R. China), Ilsun You (Korean Bible University, Korea) .................................................. 986

**The Multicast Service Model for Next Generation Internet based on Identifier/Locator Separation**  
Jianfeng Guan (Beijing University of Posts and Telecommunications, P.R. China), Wei Quan (Beijing University of Posts and Telecommunications, P.R. China), Changqiao Xu (Beijing University of Posts and Telecommunications, P.R. China), Huachun Zhou (Beijing Jiaotong University, P.R. China), Zhang Hongke (Beijing Jiaotong University, P.R. China) .......................................................... 992

**Network Mobility Management in HIMALIS Architecture of Future Networks**  
Ved P. Kafle (National Institute of Information and Communications Technology (NICT), Japan), Ruidong Li (National Institute of Information and Communications Technology (NICT), Japan), Hajime Tazaki (National Institute of Information and Communications Technology, Japan), Hiroaki Harai (National Institute of Information and Communications Technology, Japan) .................................................. 998

**An Experimental Framework for Vertical Hand-Over to Guarantee Session Continuity in Heterogeneous Wireless Environments**  
Andreas Bontozoglou (University of Essex, United Kingdom), Kun Yang (University of Essex, United Kingdom), Ken Guild (University of Essex, United Kingdom), Marcos Ferrera (Universidad Autonoma del Estado de Hidalgo, Mexico) .................................................. 1004

**A Content Retrieval Model for Information Centric MANETs: 1-Dimensional Case**  
Wei Quan (Beijing University of Posts and Telecommunications, P.R. China), Jianfeng Guan (Beijing University of Posts and Telecommunications, P.R. China), Shijie Jia (State Key Laboratory of Networking and Switching Technology, P.R. China), Junlong Zhu (Beijing University of Posts and Telecommunications, P.R. China), Changqiao Xu (Beijing University of Posts and Telecommunications, P.R. China), Zhang Hongke (Beijing Jiaotong University, P.R. China) .................................................. 1010

MobiSession2

**An Inter-Store Transaction Mechanism to Distribute Mobile Applications**  
Chen-Yuan Chuang (National Chiao Tung University, Taiwan), Hsu-Sheng Chang (Chungwha Telecom, Taiwan), Yuh-Jer Hung (Chungwha Telecom, Taiwan) .................................................. 1016

**Challenges and Opportunities in Content Distribution Networks: A Case Study**  
Muslim Elkotob (Media Broadcast, TDF Group, Germany), Karl Andersson (Luleå University of Technology, Sweden) .................................................. 1021

**Emergency Service Model Analysis to Heterogeneous Network Environment**  
Huei-Min Liao (National Ilan University, Taiwan), Kai-Di Chang (National Taiwan University of Science and Technology, Taiwan), Chi-Yuan Chen (National Dong Hwa University, Taiwan), Jann-Liang Chen (National Taiwan University of Science and Technology, Taiwan), Han-Chieh Chao (National Ilan University, Taiwan), Hua-Pei Chiang (Far Eastone Telecommunications Co., Ltd, Taiwan) .................................................. 1027

**Improving Security Level of LTE Authentication and Key Agreement Procedure**  
Fang-Yie Leu (University of Tung Hai, Taiwan), Ilsun You (Korean Bible University, Korea), Yi-Li Huang (TungHai University, Taiwan), Kangbin Yim (Soonchunhyang University, Korea), Cheng-Ru Dai (TungHai University, Taiwan) .................................................. 1032

**Comparison of Two Security Protocols for Preventing Packet Dropping and Message Tampering Attacks on AODV-Based Mobile Ad Hoc Networks**  
.................................................. 1037
Isaac Woungang (Ryerson University, Canada), Sanjay Kumar Dhurandher (Netaji Subhas Institute of Technology, India), Vincent Koo (Ryerson University, Canada), Issa Traore (University of Victoria, Canada)

**MobiSession3**

*A Network-based Seamless Handover scheme for Multi-homed devices*
Md Shohrab Hossain (University of Oklahoma, USA), Mohammed Atiuzzaman (University of Oklahoma, USA) ................................................................. 1042

*Multiple Virtual Interfaces to Support Multi-homing Hosts in PMIPv6 Network*
Seong-Mun Kim (Korea University, Korea), Hyon-Young Choi (Korea University, Korea), Hyo-Beom Lee (Korea University, Korea), Sung-Gi Min (Korea University, Korea), Youn-Hee Han (Korea University of Technology and Education, Korea) ................................................................. 1047

*Providing a High-Speed Train with a Broadband and Fault Tolerant IPv4/6 NEMO Environment*
Masanori Terada (Keio University, Japan), Fumio Teraoka (Keio University, Japan) .............................................................................................................. 1052

*A Mobile QoE Architecture for Heterogeneous Multimedia Wireless Networks*
Eduardo Cerqueira (Federal University of Para, Brazil), Marília Curado (University of Coimbra, Portugal), Augusto Jose Venancio Neto, Ph. D. (Universidade Federal do Rio Grande do Norte, Brazil), André Riker (University of Coimbra, Portugal), Roger Immich (University of Coimbra, Portugal), Carlos Quadros (Federal University of Para, Brazil) ................................................................. 1057

**MobiSession4**

*Nomadic Mobility between Smart Homes*
Raihan UI Islam (Luleå University of Technology, Sweden), Mischa Schmidt (NEC Laboratories Europe, Germany), Hans-Joerg Kolbe (NEC Europe Ltd., Germany), Karl Andersson (Luleå University of Technology, Sweden) .............................................................................................................. 1062

*Performance Analysis for Distributed Mobility Management Schemes Based on Flow Duration*
Li Yi (Beijing Jiaotong University, P.R. China), Huachun Zhou (Beijing Jiaotong University, P.R. China), Daochao Huang (Beijing Jiaotong University, P.R. China), Hongke Zhang (Beijing University of Posts and Telecommunications, P.R. China) .............................................................................................................. 1068

*Decoupling and Distribution of Mobility Management*
Tiago Silvestre Condeixa (Instituto de Telecomunicações, Portugal), Susana Sargento (Instituto de Telecomunicações, Universidade de Aveiro, Portugal), Andrea Giordanna O Nascimento (SITI, Universidade Lusófona, Portugal), Rute C. Sofia (SITI, Universidade Lusófona, Portugal) .............................................................................................................. 1073

*Comparative Study of Centralized Mobility Management and Distributed Mobility Management on ID/Locator Separation Architectures*
Younghyun Kim (Korea University, Korea), Haneul Ko (Korea University, Korea), Sangheon Pack (Korea University, Korea), Jong-Hyouk Lee (TELECOM Bretagne, France) .............................................................................................................. 1079

*A Smart Notification Scheme for Wireless Sensor Networks*
Fei Song (Beijing Jiaotong University, P.R. China), Lulu Liang (China Information Technology Security Evaluation Center, P.R. China), Huachun Zhou (Beijing Jiaotong University, P.R. China), Hongke Zhang (Beijing University of Posts and Telecommunications, P.R. China) .............................................................................................................. 1085

*The Stable Routing Protocol for the Cognitive Network*
Yidan Zhang (Beijing University of Posts and Telecommunications, P.R. China), Jianfeng Guan (Beijing University of Posts and Telecommunications, P.R. China), Changqiao Xu (Beijing University of Posts and Telecommunications, P.R. China), Hongke Zhang (Beijing University of Posts and Telecommunications, P.R. China) .............................................................................................................. 1090
GC'12 Workshop - MuCo: GC'12 Workshop: Multicell Cooperation

Optimization for Heterogeneous Network

Common Rate Maximization in Two-Layer Cellular Radio Systems
Kemal Davaslioglu (University of California, Irvine, USA), Ender Ayanoglu (University of California, Irvine, USA) ................................................................. 1096

Adaptive Multi-Objective Optimization for Distributed Heterogeneous Networks
Na Li (Beijing Institute of Technology, P.R. China), Chengwen Xing (Beijing Institute of Technology, P.R. China), Zesong Fei (Beijing Institute of Technology, P.R. China), Jingming Kuang (Beijing Institute of Technology, P.R. China) .................................................. 1102

CoMP and Interference Coordination in Heterogeneous Network for LTE-Advanced
Yu-Ngok Ruyue Li (ZTE Corporation, P.R. China), Huaming Wu (ZTE (USA) Inc., USA), Jian Li (ZTE Corporation, P.R. China), Weimin Li (ZTE Corporation, P.R. China), Yan Xue (ZTE Corporation, P.R. China) ................................................................. 1107

Optimal Power Control and Antenna Selection for Multi-User Distributed Antenna System with Heterogeneous QoS Constraints
Naveed Ul Hassan (Department of Electrical Engineering, LUMS School of Science and Engineering, Lahore, Pakistan), Chau Yuen (Singapore University of Technology and Design, Singapore), Zhaoyang Zhang (Zhejiang University, P.R. China) ................................................................. 1112

Transmission and Base Station Clustering/Selection

Joint Transmission Using Global Codeword and Codebook Design for Coordinated Multipoint Processing (CoMP)
Huy-Dung Han (Fujitsu Laboratories America Inc., USA), Chenxi Zhu (Fujitsu Laboratories America Inc., USA), Yueqiao Xu (Wireless Communication Group Fujitsu R&D Center Co. LTD, P.R. China), Yi Wang (Fujitsu R&D center, P.R. China), Zhi Ding (University of California at Davis, USA) ................................................................. 1118

A New Opportunistic Interference Alignment Scheme and Performance Comparison of MIMO Interference Alignment with Limited Feedback
Johann Leithon (Singapore University of Technology and Design, Singapore), Chau Yuen (Singapore University of Technology and Design, Singapore), Himal A Suraweera (Singapore University of Technology and Design, Singapore), Hui Gao (Singapore University of Technology and Design, Singapore) ................................................................. 1123

Large Scale Field Trial Results on Frequency Domain Compression for Uplink Joint Detection
Michael Grieger (Technische Universität Dresden, Germany), Stefan Boob (Technische Universität Dresden, France), Gerhard Fettweis (Technische Universität Dresden, Germany) ................................................................. 1128

Joint Base Station Selection and Distributed Compression for Cloud Radio Access Networks
Seok-Hwan Park (New Jersey Institute of Technology, USA), Osvaldo Simeone (New Jersey Institute of Technology, USA), Onur Sahin (InterDigital, Inc., USA), Shlomo (Shitz) Shamai (The Technion, Israel) ................................................................. 1134

On the Dynamic Formation of Cooperative Multipoint Transmissions in Small Cell Networks
Francesco Pantisano (University of Bologna, Finland), Mehdi Bennis (Centre of Wireless Communications, University of Oulu, Finland), Walid Saad (University of Miami, USA), Roberto Verdone (University of Bologna, Italy), Matti Latva-aho (UOYulu, Finland) ................................................................. 1139

Shared Remote Radio Head Architecture to Realize Semi-Dynamic Clustering in CoMP Cellular Networks
Daisuke Matsuo (Tokyo Institute of Technology, Japan), Roya Rezagah (Tokyo Institute of Technology, Japan), Gia Khanh Tran (Tokyo Institute of Technology, Japan), Kei Sakaguchi (Osaka University, Japan), Kiyomichi Araki (Tokyo Institute of Technology, Japan), Shoji Kaneko (KDDI R&D Laboratories Inc., Japan), Noriaki ................................................................. 1145
Energy Saving, Relay, Handover and Scheduling

Energy-Saving Coordinated Napping (CoNap) for Wireless Networks
Koichi Adachi (Institute for Infocomm Research (I2R), Singapore), Jingon Joung (Institute for Infocomm Research, Singapore), Sumei Sun (Institute for Infocomm Research, Singapore), Peng Hui Tan (Institute for Infocomm Research, Singapore) ................................................................. 1150

Energy Efficient Relay-Assisted Cellular Network Model using Base Station Switching
ATM Shaful Alam (Open University, United Kingdom), Laurence S Dooley (Open University, United Kingdom), Adrian Poulton (The Open University, United Kingdom) ................................................................. 1155

Relay Assignment over Distributed Wireless Networks: A Game Theoretic Approach
Ruijian An (National Institute of Informatics, Japan), Yu Gu (National Institute of Informatics, Japan), Yusheng Ji (National Institute of Informatics, Japan) ................................................................. 1161

Optimal Relay Deployment for Multihop Multicast Scheduling in Cellular Wireless Networks
Izhak Rubin (University of California at Los Angeles, USA), Hung-Bin Chang (University of California, Los Angeles, USA), Reuven Cohen (Technion, Israel) ................................................................. 1166

Intra-Frequency Handover Algorithm Design in LTE Networks Using Doppler Frequency Estimation
Omar H Alttrad (Simon Fraser University, Canada), Sami Muhaidat (Khalifa University, UAE) .......................................................................................................................... 1172

On Downlink Coordinated Scheduling for Inter-cell Interference Alleviation with Inter-BS Cooperation
Qi Wang (National Mobile Communications Research Laboratory, Southeast University, P.R. China), Shi Jin (Southeast University, P.R. China), Qiang Sun (Southeast University, P.R. China), Xiao Li (Southeast University, P.R. China), Yongming Huang (Southeast University, P.R. China), Xiqi Gao (Southeast University, P.R. China) .......................................................................................................................... 1178

GC'12 Workshop - OWC: 3rd IEEE Workshop on Optical Wireless Communications (OWC’12)

FSO

Receiver Design for Shot Noise Limited MIMO FSO/UV Communication Systems
Ankit Gupta (University of Virginia, USA), Maite Brandt-Pearce (University of Virginia, USA) .......................................................................................................................... 1183

Impact of Tracking Errors on Dual Diversity Structure Over the Free Space Optics Links
Peng Liu (North China Electric Power University, P.R. China), Song Liu (North China Electric Power University, P.R. China), Mitsui Matsumoto (Waseda University, Japan) .......................................................................................................................... 1188

Opportunistic Cooperation for FSO Links Aided by Decode and Forward Relay
Quanfeng He (Qualcomm Technologies Inc., USA), Zhengyuan Xu (University of California, Riverside, USA) .......................................................................................................................... 1193

FSO-MIMO Behavior in Variable Atmospheric Turbulence - an Asymptotic Approach
Istvan Frigyes (Budapest University of Technologies, Hungary), László Csurgai-Horváth (Budapest University of Technology and Economics, Hungary), Peter Horvath (Vanderbilt University, USA) .......................................................................................................................... 1198

Modulation

Achievable Data Rate Analysis of Clipped Flip-OFDM in Optical Wireless Communication 1203
Pulse Shaping in Unipolar OFDM-based Modulation Schemes
Dobroslav A. Tsonev (University of Edinburgh, United Kingdom), Sinan Sinanović (University of Edinburgh, United Kingdom), Harald Haas (The University of Edinburgh, United Kingdom) 1208

Analytical Model for Optical Wireless OFDM System with Digital Signal Restoration
Evgeny V. Vanin (Acreo AB, Sweden) 1213

Position Modulating OFDM for Optical Wireless Communications
Asanka Nuwanpriya (University of South Australia, Australia), Alex Grant (University of South Australia, Australia), Siu-Wai Ho (University of South Australia, Australia), Lin Luo (University of South Australia, Australia) 1219

Constellation Design for Color-Shift Keying Using Interior Point Methods
Eric Monteiro (McMaster University, Canada), Steve Hranilovic (McMaster University, Canada) 1224

Performance Analysis of Multi-pulse PPM for Optical Wireless Hierarchical Transmission System
Yusuke Kozawa (Tokyo University of Science, Japan), Hiromasa Habuchi (Ibaraki University, Japan) 1229

Imaging

High-speed Transmission of Overlay Coding for Road-to-Vehicle Visible Light Communication Using LED Array and High-Speed Camera
Sayaka Nishimoto (Nagoya University, Japan), Takaya Yamazato (Nagoya University, Japan), Hiraku Okada (Nagoya University, Japan), Toshiaki Fujii (Nagoya University, Japan), Tomohiro Yendo (Nagoya University, Japan), Shintaro Arai (Kagawa National College of Technology, Japan) 1234

Hemispherical Lens Based Imaging Receiver for MIMO Optical Wireless Communications
Thomas Wang (Monash University, Australia), Ahmet Sekercioglu (Monash University, Australia), Jean Armstrong (Monash University, Australia) 1239

Using a CMOS Camera Sensor for Visible Light Communication
Christos Danakis (PureVLC Ltd., United Kingdom), Mostafa Afgani (PureVLC Ltd., United Kingdom), Gordon Povey (PureVLC Ltd., United Kingdom), Ian Underwood (University of Edinburgh, United Kingdom), Harald Haas (The University of Edinburgh, United Kingdom) 1244

Applications

State Estimation and Motion Tracking for Spatially Diverse VLC Networks
Michael Rahaim (Boston University, USA), Gregory B Prince (Boston University & NSF Smart Lighting ERC, USA), Thomas DC Little (Boston University, USA) 1249

Hybrid Visible Light Communications in Intelligent Transportation Systems with Position Based Services
Jiang Liu (Waseda University, Japan), Peter Chan (CTTC-HK, Hong Kong), Derrick Wing Kwan Ng (University Erlangen-Nürnberg, Germany), Ernest S. Lo (Centre Tecnològic de Telecomunicacions de Catalunya, Hong Kong), Shigeru Shimamoto (Waseda University, Japan) 1254

Designs of a Free-Space White-LED Mass-Storage Transceiver for SD-Card File Transfer
Lih Chieh Png (Nanyang Technological University, Singapore), Nhat Le Minh (Nanyang Technological University, Singapore), Liangquan Chen (Nanyang Technological University, Singapore), Kiat Seng Yeo (Nanyang Technological University, Singapore) 1260

An LED-to-LED Visible Light Communication System with Software-Based Synchronization

1264
GC'12 Workshop - QoEMC: GC'12 Workshop: Quality of Experience for Multimedia Communications

Session I - QoE in Wireless Multimedia

YouTube & Facebook Quality of Experience in Mobile Broadband Networks
Pedro Casas (Telecommunications Research Center Vienna (FTW), Austria), Andreas Sackl (FTW Telecommunications Research Center Vienna, Austria), Sebastian Egger (Telecommunications Research Center Vienna (FTW), Austria), Raimund Schatz (Telecommunications Research Center Vienna (FTW), Austria) ................................................................. 1269

Power-Driven VoIP Quality Adaptation Over WLAN in Mobile Devices
Is-Haka Mkwawa (University of Plymouth, United Kingdom) .......................................................................................... 1276

A Parametric QoE Video Quality Estimator for Wireless Networks
Eduardo Cerqueira (Federal University of Para, Brazil), Augusto Jose Venancio Neto, Ph. D. (Universidade Federal do Rio Grande do Norte, Brazil), Roger Immich (University of Coimbra, Portugal), Marilia Curado (University of Coimbra, Portugal), André Riker (University of Coimbra, Portugal), Hugo Barros (Federal University of Rio Grande do Norte, Brazil) ................................................................. 1282

Cross-Layer Algorithms for Distortion-Fair Scalable Video Delivery over OFDMA Wireless Systems
Sergio Cicalò (University of Ferrara - Italy, Italy), Velio Tralli (University of Ferrara - Italy, Italy) ................................................................. 1287

A QoE-based OFDM Resource Allocation Scheme for Energy Efficiency and Quality Guarantee in Multiuser-Multiservice System
Bingquan Li (Beijing Institute of Technology, P.R. China), Shuo Li (Beijing Institute of Technology, P.R. China), Chengwen Xing (Beijing Institute of Technology, P.R. China), Zesong Fei (Beijing Institute of Technology, P.R. China), Jingming Kuang (Beijing Institute of Technology, P.R. China) ................................................................. 1293

Session II - QoE Modeling

Intention-Aware Multimedia Modeling for Optimized Quality of Experience
Vincent Verdot (Alcatel-Lucent Bell Labs, France), Arnaud Gonguet (Alcatel-Lucent Bell Labs France, France), Nicolas Bouché (Alcatel-Lucent Bell Labs, France), Ubirajara Lucena Pereira Silva, Junior (Alcatel-Lucent Bell Labs France, France) .......................................................................................... 1298

Evaluation of several visual saliency models in terms of gaze prediction accuracy on video
Victor Mateescu (Simon Fraser University, Canada), Hadi Hadizadeh (Simon Fraser University, Canada), Ivan V. Bajic (Simon Fraser University, Canada) .......................................................................................... 1304

Toward task-dependent evaluation of Web-QoE: Free exploration vs. "Who Ate What?"
Dominik Strohmeier (Telekom Innovation Laboratories, Berlin University of Technology, Germany), Satu Jumisko Pyykkö (Tampere University of Technology, Finland), Alexander Raake (Deutsche Telekom Laboratories / Berlin University of Technology, Germany) .......................................................................................... 1309

QoE-Based Evaluation Model on Video Streaming Service Quality................................................................. 1314
Yun Shen (Beijing University of Posts and Telecommunications, P.R. China), Yitong Liu (Beijing University of Post and Telecommunications, P.R. China), Nan Qiao (Beijing University of Posts and Telecommunications, P.R. China), Lin Sang (Beijing University of Posts and Telecommunications, P.R. China), Dacheng Yang (Beijing University of Posts and Telecommunications, P.R. China)

Online Learning for QoE-based Video Streaming to Mobile Receivers .......................................................................................... 1319
Session III - QoE Metrics & Estimation

A New Reduced Reference Objective Quality Metric for Stereoscopic Video
Hossein Malekmohamadi (University of Surrey, United Kingdom), Anil Fernando
(Center for Communications Research, University of Surrey, United Kingdom),
Ahmet Kondoz (University of Surrey, United Kingdom) ........................................ 1325

QoE Assessment of Multimedia Video Consumption on Tablet Devices
Alessandro Floris (University of Cagliari, Italy), Luigi Atzori (University of Cagliari,
Italy), Giaime Ginesu (University of Cagliari, Italy), Daniel D Giusto (University of
Cagliari, Italy) .............................................................................................................. 1329

A model of network related QoE for 3D video
Ilias Politis (University of Patras, Greece), Lampros Dounis (Technological
Educational Institute of Messolonghi, Greece), Christos Tselios (University of Patras,
Greece), Athanasios Kordelas (Dept. of Telecommunication System and Networks,
Greece), Tasos Dagiuklas (Technological Educational Institute of Messolonghi,
Greece), Andreas Papadakis (School of Pedagogical and Technological Education
(ASPETE), Greece) .................................................................................................. 1335

Systems Considerations in Real Time Video QoE Assessment
Amy Csizmar Dalal (Carleton College, USA) ................................................................. 1341

No-reference Quality of Experience estimation of H264/SVC stream
Wael Cherif (University of Rennes 1, France), Adlen Ksentini (University of Rennes
1 / IRISA Lab, France), Daniel Négru (University of Bordeaux, France) ....................... 1346

Session IV - QoE Evaluation

The Role of Cognitive Dissonance for QoE Evaluation of Multimedia Services
Andreas Sackl (FTW Telecommunications Research Center Vienna, Austria), Patrick
Zwickl (Telecommunications Research Center Vienna (FTW), Austria), Sebastian
Egger (Telecommunications Research Center Vienna (FTW), Austria), Peter Reichl
(Université Européenne de Bretagne / Télécom Bretagne, Rennes, France) .................... 1352

Quality perception of coding artifacts and packet loss in networked video
communications
Soo-Jin Kim (Yonsei University, Korea), Chan-Byoung Chae (Yonsei University,
Korea), Jong-Seok Lee (Yonsei University, Korea) ....................................................... 1357

QoE-based Performance Evaluation of Scheduling Algorithms over LTE
Ali Alfayly (Plymouth University, United Kingdom) ..................................................... 1362

Online path selection for video delivery over cellular networks
Daniele Munaretto (University of Padova, Italy), Telemaco Melia (Independent
Researcher, Switzerland), Sabine Randriamasy (Alcatel, France), Michele Zorzi
(University of Padova, Italy) ......................................................................................... 1367

CoS Enforcement for HTTP Adaptive Streaming
Kevin J Ma (University of New Hampshire, USA), Radim Bartos (University of New
Hampshire, USA) ....................................................................................................... 1373

GC'12 Workshop - RSN: GC’12 Workshop: Radar and Sonar Networks

Networking and Optimization

and Research Challenges ............................................................................................. 1378
Compressive Sensing in RSN

**Super-resolution SAR Tomography Focusing by Lp-Norm Regularization-the FOCUSS Algorithm**
Qianqian Yang (University of Electronic Science and Technology of China (UESTC), P.R. China), Rui Min (University of Electronic Science and Engineering of China, P.R. China), Zongjie Cao (University of Electronic Science and Engineering of China, P.R. China), Yiming Pi (UESTC, USA).......................... 1384

**Classification of Transmission Environment in UWB Communication Using a Support Vector Machine**
Ru Ying (Beijing University of Posts and Telecommunications, P.R. China), Ting Jiang (Beijing University of Posts & Telecommunications, P.R. China), Zhihao Xing (Huawei Technologies Co., Ltd, P.R. China).......................... 1389

**Low Complexity Receiver Design for MIMO-Radar**
Sajid Ahmed (King Abdullah University of Science and Technology, Thuwal, KSA, Saudi Arabia), Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia).......................... 1394

**Energy-balanced Routing Scheme in Varying ZigBee Networks**
Jiasong Mu (Tianjin Normal University, P.R. China), Baoju Zhang (Tianjin Normal University, P.R. China), Wei Wang (Tianjin Normal University, P.R. China).......................... 1399

**A Multi-hop Routing Protocol Based on Grid Optimization for Wireless Sensor Networks**
Xiaochuan Zhao (Beijing University of Posts and Telecommunications, P.R. China), Zheng Zhou (Beijing University of Posts and Telecommunications, P.R. China), Ting Jiang (Beijing University of Posts & Telecommunications, P.R. China), Zhichao Qin (Beijing University of Posts and Telecommunications, P.R. China), Zhang Yang (Beijing University of Posts and Telecommunications, P.R. China).......................... 1405

**Compressive Sensing in Radar Sensor Networks for Target RCS Value Estimation**
Lei Xu (UTA, USA), Qilian Liang (University of Texas at Arlington, USA), Baoju Zhang (Tianjin Normal University, P.R. China), Xiaorong Wu (Tianjin Normal University, P.R. China).......................... 1410

**Sparsity and compressive sensing for SAR signal**
Wei Wang (Tianjin Normal University, P.R. China), Baoju Zhang (Tianjin Normal University, P.R. China), Jiasong Mu (Tianjin Normal University, P.R. China), Xiaorong Wu (Tianjin Normal University, P.R. China).......................... 1416

**A Novel and Comprehensive Compressive Sensing-based System for Data Compression**
Ji Wu (UTA, USA), Qilian Liang (University of Texas at Arlington, USA), Chiman Kwan (Signal Processing Inc, USA).......................... 1420

**Research of image sparse algorithm based on compressed sensing**
Qing Lei (Tianjin Normal University, P.R. China), Baoju Zhang (Tianjin Normal University, P.R. China), Wei Wang (Tianjin Normal University, P.R. China).......................... 1426

**Amplitude Based Compressive Sensing for UWB Noise Radar Signal**
Ji Wu (University of Texas At Arlington, USA), Qilian Liang (University of Texas at Arlington, USA), Xiuqin Cheng (George Washington Univ, USA), Dechang Chen (Uniformed Services University of the Health Sciences, USA), Ram Narayanan (The Pennsylvania State University, USA).......................... 1430

**Target detection and classification**

**UWB Radar for Target Detection: DCT versus Matched Filter Approaches**
Qilian Liang (University of Texas at Arlington, USA), Baoju Zhang (Tianjin Normal University, P.R. China), Xiaorong Wu (Tianjin Normal University, P.R. China).......................... 1435
### SAR target feature extraction based on sparse constraint nonnegative matrix factorization
Xin Gao (University of Electronic Science and Technology, P.R. China), Zongjie Cao (University of Electronic Science and Engineering of China, P.R. China), Yingxi Zheng (University of Electronic Science and Technology of China, P.R. China), Yong Fan (University of Electronic Science and Engineering of China, P.R. China), Qi Zhang (University of Electronic Science and Engineering of China, P.R. China)

Page: 1440

### Gulf of Mexico Oil Spill Impact on Beach Soil: UWB Radars-Based Approach
Qilian Liang (University of Texas at Arlington, USA), Baoju Zhang (Tianjin Normal University, P.R. China), Xiaorong Wu (Tianjin Normal University, P.R. China)

Page: 1445

### SAR Automatic Target Recognition Using a Hierarchical Multi-feature Fusion Strategy
Zongjie Cao (University of Electronic Science and Engineering of China, P.R. China), Zongyong Cui (University of Electronic Science and Technology of China, P.R. China), Yong Fan (University of Electronic Science and Engineering of China, P.R. China), Qi Zhang (University of Electronic Science and Engineering of China, P.R. China)

Page: 1450

### Experimental Study of Through-wall Human Being Detection Using Ultra-wideband (UWB) Radar
Ashith Kumar (University of Texas at Arlington, USA), Qilian Liang (University of Texas at Arlington, USA), Zhuo Li (The University of Texas at Arlington, USA), Baoju Zhang (Tianjin Normal University, P.R. China), Xiaorong Wu (Tianjin Normal University, P.R. China)

Page: 1455

### A Method of Target Detection and Identification Based On RPROP and UWB Channel Characteristic Parameters
Junqin He (Beijing University of Posts & Telecommunications, P.R. China), Ting Jiang (Beijing University of Posts & Telecommunications, P.R. China), Zhihao Xing (Huawei Technologies Co., Ltd, P.R. China)

Page: 1460

---

**GC’12 Workshop - SGComm 2012: GC’12 Workshop: Smart Grid Communications: Design for Performance**

### Session I: Networking for smart metering and demand response management

#### PMU Deployment for Optimal State Estimation Performance
Yue Yang (University of Washington, USA), Sumit Roy (University of Washington, USA)

Page: 1464

#### Smooth Electric Power Scheduling in Power Distribution Networks
Yingsong Huang (Auburn University, USA), Shiwen Mao (Auburn University, USA), Mark Nelms (Co-Chair, USA)

Page: 1469

#### An optimization-based demand response in radial distribution networks
Na Li (California Institute of Technology, USA), Lijun Chen (University of Colorado at Boulder, USA), Lingwen Gan (California Institute of Technology, USA), Steven Low (California Institute of Technology, USA)

Page: 1474

#### Highly Reliable Star and Sub-Mesh Hybrid Sensor Network for Smart Grid Monitoring
Leonardo Goratti (Joint Researh Center (JRC), Italy), Jussi P Haapola (Centre for Wireless Communications, University of Oulu, Finland), Shuzo Kato (Tohoku University, Japan)

Page: 1480

---

### Session II: Communication architectures, networks and protocols for Smart Grid

#### A Study on the Impact of Packet Loss and Latency on Real-Time Demand Response in Smart Grid
Marco Pruckner (University of Erlangen, Germany), Abdalkarim Awad (University of Erlangen, Germany), Reinhard German (University of Erlangen, Germany)

Page: 1486

#### DRIFT: Differentiated RF-based Power Transmission for Wireless Sensor Network Deployment in the Smart Grid

Page: 1491
Session III: Security and performance issues in Smart Grid Communications

Exploiting the GOOSE protocol: A practical attack on cyber-infrastructure
Juan Hoyos (University of Colorado at Boulder, USA), Mark Dehus (University of Colorado Boulder, USA), Timothy Brown (University of Colorado, USA).......................... 1508

The Not-So-Smart Grid: Preliminary Work on Identifying Vulnerabilities In ANSI C12.22
Shehla Rana (University of Illinois Urbana Champaign, USA), David Nicol (University of Illinois, Champaign-Urbana, USA), Cheol Lee (Seoul National University, Korea), Incheol Shin (National Security Research Institute, Korea), Huaiyu Zhu (University of Illinois at Urbana-Champaign, USA)............................................. 1514

Charging of Electric Vehicles Utilizing Random Wind: A Stochastic Optimization Approach
Mathew Pradeep Goonewardena (University of Quebec, Canada), Long Bao Le (INRS, University of Quebec, Canada)......................................................................... 1520

Support Vector Machine based Fault Detection & Classification in Smart Grids
Nauman Shahid (Lahore University of Management Sciences, Pakistan), Saad Abdul Aleem (LUMS School of Science and Engineering (SSE), Pakistan), Ijaz Haider Naqvi (LUMS School of Science and Engineering (SSE), Pakistan), Nauman Zaffar (Lahore University of Management Sciences, Pakistan)............................................. 1526


Connectivity and Coverage Optimization for Unmanned Systems

Optimal Motion and Communication for Persistent Information Collection using a Mobile Robot
Alireza Ghaffarkhah (University of New Mexico, USA), Yasamin Mostofi (University of California, Santa Barbara, USA)........................................................................ 1532

Impact of Motion and Channel Parameters on the Estimation of Transmitter Position in Robotic Networks
Mehrzad Malmirchegini (University of New Mexico, USA), Alireza Ghaffarkhah (University of New Mexico, USA), Yasamin Mostofi (University of California, Santa Barbara, USA)........................................................................ 1538

Communication Provision for a Team of Remotely Searching UAVs: A Mobile Relay Approach
Chunbo Luo (University of Ulster, United Kingdom), Paul Ward (Oxford University Computer Science Department, United Kingdom), Stephen Cameron (University of Oxford, United Kingdom), Gerard P. Parr (University of Ulster, United Kingdom), Sally I McLean (University of Ulster, Coleraine, United Kingdom).................................................. 1544

Experimental Validation of RSS Driven UAV Mobility Behaviors in IEEE 802.11s Networks
......................................................................................................................... 1550
Cooperative Behavior of Unmanned Systems

Robust Minimum Energy Wireless Routing for Underwater Acoustic Communication Networks
Brooks Reed (MIT, USA), Milica Stojanovic (Northeastern University, Boston, USA), Urbashi Mitra (University of Southern California, USA), Franz Hover (MIT, USA) .................................................. 1556

Multiple Event Localization in a Sparse Acoustic Sensor Network Using UAVs as Data Mules
Jason Isaacs (University of California, Santa Barbara, USA), Sriram Venkateswaran (University of California, Santa Barbara, USA), Joao P. Hespanha (University of California, Santa Barbara, USA), Upamanyu Madhow (University of California, Santa Barbara, USA), Jerry Burman (Teledyne Scientific Company, USA), Tien Pham (US Army Research Laboratory, USA) .......................................................... 1562

Path- and data transmission planning for cooperating UAVs in delay tolerant network
Esten Ingar Grøtli (Norwegian University of Science and Technology, Norway), Tor Arne Johansen (Norwegian University of Science and Technology, Norway) ..................................................... 1568

Mobile Robots Assisted Target Tracking in Wireless Sensor Networks
Phuong Pham (University of Oklahoma, USA), Anh Mai (University of Oklahoma, USA), Sesh Commuri (University of Oklahoma, USA) .................................................. 1574

Unmanned Vehicle Based Ad-hoc Meshing

Multi-UAV Network Control through Dynamic Task Allocation: Ensuring Data-Rate and Bit-Error-Rate Support
Andrew Kopeikin (Massachusetts Institute of Technology, USA), Sameera Ponda (Massachusetts Institute of Technology, USA), Luke Johnson (Massachusetts Institute of Technology, USA), Jonathan How (Massachusetts Institute of Technology, USA) .................................................. 1579

Optimal Relay Path Selection and Cooperative Communication Protocol for a Swarm of UAVs
Dac-Tu Ho (Norwegian University of Science and Technology-NTNU, Norway), Esten Ingar Grøtli (Norwegian University of Science and Technology, Norway), Shigeru Shimamoto (Waseda University, Japan), Tor Arne Johansen (Norwegian University of Science and Technology, Norway) .................................................. 1585

Implementation of a Wireless Mesh Network of Ultra Light MAVs with Dynamic Routing
Alberto Jimenez-Pacheco (École Polytechnique Fédérale de Lausanne, Switzerland), Denia Bouhired (École Polytechnique Federale de Lausanne, Switzerland), Yannick Gasser (EPFL, Switzerland), Jean-Christophe Zufferey (EPFL, Switzerland), Dario Floreano (, Switzerland), Bixio Rimoldi (EPFL, Switzerland) .................................................. 1591

A Geographic Mobility Prediction Routing Protocol For Ad Hoc UAV Network
Lin Lin (Beijing University of Posts and Telecommunications, P.R. China), Qibo Sun (Beijing University of Posts and Telecommunications, P.R. China), Shangguang Wang (Beijing University of Posts and Telecommunications, P.R. China), FangChun Yang (Beijing University of Posts & Telecommunications, P.R. China) .................................................. 1597

UAV System Design Aspects

UAVnet: A Mobile Wireless Mesh Network Using Unmanned Aerial Vehicles
Simon Morgenthaler (University of Bern, Switzerland), Torsten Ingo Braun (University of Bern, Switzerland), Zhongliang Zhao (University of Bern, Switzerland), Thomas Staub (University of Bern, Switzerland), Markus Anwander (University of Bern, Switzerland) .................................................. 1603

Online Evaluation of Communication Models Derived via Transfer Learning
 .................................................. 1609
GC'12 Workshop: Second International Workshop on Machine-to-Machine Communications 'Key' to the Future Internet of Things

Resource Management

Evolution of Packet Scheduling for Machine-Type Communications over LTE: Algorithmic Design and Performance Analysis
Antonis G Gotsis (University of Piraeus, Greece), Athanasios Lioumpas (University of Piraeus, Greece), Angeliki Alexiou (University of Piraeus, Greece)

RAN overload control for Machine Type Communications in LTE
Anna Larmo (Ericsson Research, Finland), Rikka Susitaival (Ericsson Research, Finland)

Energy and Delay Analysis of LTE-Advanced RACH Performance under MTC Overload
Mikhail Gerasimenko (Tampere University of Technology, Finland), Vitaly Petrov (Tampere University of Technology, Finland), Olga Galinina (Tampere University of Technology, Finland), Sergey Andreev (Tampere University of Technology, Finland), Yevgeni Koucheryavy (Tampere University of Technology, Finland)

On Resource Allocation for Machine-to-Machine (M2M) Communications in Cellular Networks
Harpreet S Dhillon (The University of Texas at Austin, USA), Howard Huang (Alcatel-Lucent, USA), Harish Viswanathan (Bell Labs, Alcatel-Lucent, USA), Reinaldo Valenzuela (Lucent Technologies, USA)

Energy-Efficiency

Energy-Efficient Power Allocation for M2M Communications with Energy Harvesting Transmitter
Derrick Wing Kwan Ng (University Erlangen-Nürnberg, Germany), Robert Schober (University of British Columbia, Canada)

Reducing Energy Consumption of LTE Devices for Machine-to-Machine Communication
Tuomas Tirronen (Ericsson Research, Finland), Anna Larmo (Ericsson Research, Finland), Joachim Sachs (Ericsson Research, Germany), Nicolas Wiberg (Ericsson Research, Sweden), Bengt Lindoff (Ericsson AB, Sweden)

A Learning Theoretic Approach to Energy Harvesting Communication System Optimization
Pol Blasco (CTTC, Spain), Deniz Gündüz (Imperial College London, United Kingdom), Mischa Dohler (CTTC, Spain)

Optimizing Energy-Efficiency of PHY-Layer Authentication in Machine-to-Machine Networks
Andrea Bartoli (CTTC, Spain), Juan Hernández-Serrano (Universitat Politècnica de Catalunya (UPC), Spain), Miguel Soriano (Technical University of Catalonia, Spain), Mischa Dohler (CTTC, Spain), Apostolos Kountouris (France Telecom, France), Dominique Barthel (Orange Labs, France)

Medium Access Control

A Hybrid Contention/Reservation Medium Access Protocol for Wireless Sensor Networks
Petros S. Bithas (University of Piraeus, Greece), Athanasios Lioumpas (University of Piraeus, Greece), Angeliki Alexiou (University of Piraeus, Greece)
Selected Topics

- **Enhancements to CDMA2000 1x for M2M Communications**
  Rashid Attar (QUALCOMM Inc., USA), Linhai He (Qualcomm, USA), Christopher Lott (Qualcomm, Inc., USA), Ravi Patwardhan (Qualcomm, USA), Jing Sun (Qualcomm, USA)  
  1675

- **Code-Expanded Random Access for Machine-Type Communications**
  Nuno K Pratas (Aalborg University, Denmark), Henning Thomsen (Aalborg University, Denmark), Čedomir Stefanović (Aalborg University, Denmark), Petar Popovski (Aalborg University, Denmark)  
  1681

- **Feasibility Study of IEEE 802.11ah Radio Technology for IoT and M2M use Cases**
  Ali Hazmi (Tampere University of Technology, Finland), Jukka Rinne (Tampere University of Technology, Finland), Mikko Valkama (Tampere University of Technology, Finland)  
  1687

- **Cooperative Coverage Extension in Heterogeneous Machine-to-Machine Networks**
  Giuseppe Cocco (CTTC, Spain), Christian Ibars (Centre Tecnologic de Telecomunicacions de Catalunya - CTTC, Spain), Nader Alaghha (European Space Agency, The Netherlands)  
  1693

- **Providing Statistical QoS Guarantees in Large Cognitive Machine-to-Machine Networks**
  Shih Chun Lin (National Taiwan University, Taiwan), Lei Gu (National Taiwan University, Taiwan), Kwang-Cheng Chen (National Taiwan University, Taiwan)  
  1700

- **Sparsity Aware Multiuser Detection for Machine to Machine Communication**
  Fabian Monsees (University of Bremen, Germany), Carsten Bockelmann (University of Bremen, Germany), Dirk Wübben (University of Bremen, Germany), Armin Dekorsy (University of Bremen, Germany)  
  1706

- **Service-domain solutions to radio interference for M2M communications and networking**
  Milos Tesanovic (Fujitsu Laboratories of Europe Ltd., United Kingdom), Paul Bucknall (Fujitsu Laboratories of Europe Limited, United Kingdom), Hind Munzer Chebbo (Fujitsu Laboratories of Europe, United Kingdom), Jumoke Ogunbekun (Fujitsu Laboratories of Europe Ltd., United Kingdom)  
  1712

**GC’12 Workshop - ONIT 2012: GC’12 Workshop: 4th Open NGN and IMS Testbeds Workshop**

**Networking Session**

- **Past and Current IMS Testbed Initiatives The UCT IMS and EPC Testbed**
  Joyce Mwangama (University of Cape Town, South Africa), Richard Spiers (University Of Cape Town, South Africa), Neco Ventura (University of Cape Town, South Africa)  
  1718

- **Integrating off-the-shelf 3GPP access networks in the OpenEPC software toolkit**
  Marius Corici (Fraunhofer FOKUS, Germany), Mihai Constantin (Fraunhofer FOKUS Institute, Germany), Dana Dwianto Satriya (Fraunhofer FOKUS Institute, Germany), Dragos Vingarzan (Fraunhofer-FOKUS Institute, Germany), Valentin Vlad (Fraunhofer FOKUS Institute, Germany), Lukas Wöllner (Fraunhofer FOKUS Institute, Germany)  
  1724

- **Ethernet-Services Transport Protocol Design oriented to Carrier Ethernet Networks**
  Claudio I Estevez (University of Chile, Chile), Sergio Angulo (University of Chile, Chile), Alfonso Ehijo (University of Chile, Chile), Georgios Ellinas (University of Cyprus, Cyprus), Gee-Kung Chang (Georgia Tech, USA)  
  1730
Applications Session

OpenMTC: Prototyping Machine Type Communication in Carrier Grade Operator Networks
Marius Corici (Fraunhofer FOKUS, Germany), Hakan Coskun (Technische Universität Berlin, Germany), Asma Elmangoush (Technical University Berlin, Germany), Agus Kurniawan (Fraunhofer FOKUS Institute, Germany), Thomas Magedanz (Fraunhofer FOKUS / TU Berlin, Germany), Sebastian Wahle (Fraunhofer FOKUS, Germany), Tong Mao (FOKUS, Germany) ................................. 1735

X-centric Positioning: A Combination of Device-centric and Multi-RAT Network-centric Positioning Approaches
Mohamed Salem (Telekom Innovation Laboratories - TU Berlin, Germany), Peter Ruppel (Technische Universität Berlin, Germany), Ulrich Bareth (Technische Universität Berlin, Germany), Axel Küpper (TU Berlin, Germany) ......................................................... 1741

Machine Type Communications in 3GPP
Andreas Kunz (NEC Europe Ltd., Germany), LaeYoung Kim (LG Electronics, Korea), Hyunsook Kim (LG Electronics, Korea), Syed S Husain (Telecom Consultant-Industry Standards, USA) ................................................................. 1747