

# **2015 9th International Conference on Next Generation Mobile Applications, Services and Technologies (NGMAST 2015)**

**Cambridge, United Kingdom  
9 – 11 September 2015**



**IEEE Catalog Number: CFP1574C-POD  
ISBN: 978-1-4799-8661-3**

**Copyright © 2015 by the Institute of Electrical and Electronic Engineers, Inc  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\*This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1574C-POD
ISBN (Print-On-Demand):	978-1-4799-8661-3
ISSN:	2161-2889

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# **2015 9th International Conference on Next Generation Mobile Applications, Services and Technologies**

**NGMAST 2015**

## **Table of Contents**

<b>Message from the Chair</b>	xi
<b>Conference Organization</b>	xii
<b>Program Committee</b>	xiii
<b>Acknowledgements</b>	xv
<b>Keynotes</b>	xvi

## **Applications**

Streaming at the Edge: Local Service Concepts Utilizing Mobile Edge Computing .....	1
<i>Olli Mäkinen</i>	
Device-Controlled Traffic Steering in Mobile Networks .....	7
<i>Menglan Jiang</i>	
Refining Mobile Web Design for Reducing Energy Consumption of Mobile Terminals .....	13
<i>Takuya Ihara, Suguru Doki, Tomohiko Ogishi, Suhua Tang, and Sadao Obama</i>	
Spheres: A Web Services Framework for Smartphone Sensing as a Service .....	19
<i>Mark Allen Gray</i>	
Web Service Query Selection for a Professional Social Network Members .....	29
<i>Swapnil S. Ninawe and Pallapa Venkataram</i>	

# Cloud Security

BBCast: Cloud-Based Interactive Public Bulletin Board .....	35
<i>Jan Franz Palngipang, Miguel Luis Ting, and Rowel Atienza</i>	
Development of Management System for Generated Power Using Cloud Services: Application to Aero-Bike Equipped with Dynamo .....	41
<i>Tatsuki Ebihara, Shotaro Murata, and Hiroshi Tanaka</i>	

Denial of Service Attacks Mitigation in the Cloud .....	47
<i>Wael Alosaimi, Michal Zak, and Khalid Al-Begain</i>	
Enhancement in Homomorphic Encryption Scheme for Cloud Data Security .....	54
<i>Samjot Kaur and Vikas Wasson</i>	
Simulation-Based Study of Distributed Denial of Service Attacks Prevention in the Cloud .....	60
<i>Wael Alosaimi, Mazin Alshamrani, and Khalid Al-Begain</i>	
 <b>The Internet of Things (IoT)</b>	
Connect and Control Things: Integrating Lightweight IoT Framework into a Mobile Application .....	66
<i>Soumya Kanti Datta and Christian Bonnet</i>	
Internet of Things: A Definition & Taxonomy .....	72
<i>Bruno Dorsemaine, Jean-Philippe Gaulier, Jean-Philippe Wary, Nizar Kheir, and Pascal Urien</i>	
Q-learning Based Random Access with Collision free RACH Interactions for Cellular M2M .....	78
<i>Lawal Mohammed Bello, Paul Mitchell, David Grace, and Tautvydas Mickus</i>	
Urban Scale Context Dissemination in the Internet of Things: Challenge Accepted .....	84
<i>Alistair Morris, Constantinos Patsakis, Mauro Dragone, Atif Manzoor, Vinny Cahill, and Mélanie Bourroche</i>	
A Lightweight Authentication Scheme for E-Health Applications in the Context of Internet of Things .....	90
<i>Hamza Khemissa and Djamel Tandjaoui</i>	
 <b>Wireless Sensor Networks</b>	
A Study of Network Stability on Wireless Sensor Networks .....	96
<i>Koichi Ishibashi and Katsunori Yamaoka</i>	
Swarming Medium Access Control Protocol for Large-Scale Wireless Sensor Networks .....	102
<i>Tautvydas Mickus, Tim Clarke, and Paul Mitchell</i>	
Routing Fault-Tolerance for Heterogeneous WSNs Based on an Immune Cooperative Multi-Particle-Swarm Algorithm .....	108
<i>Yifan Hu, Xiaoming Wu, Fuqiang Wang, Yong Pang, Xiangzhi Liu, Jianqiang Zhang, and Yong Fu</i>	
Fast-OB-VAN: A Fast Opportunistic Broadcast Protocol for VANETs .....	114
<i>Salvador Gonzalez and Victor Ramos</i>	

## **Localisation**

Emergency Navigation in Confined Spaces Using Dynamic Grouping .....	120
<i>Huibo Bi, Olumide J Akinwande, and Erol Gelenbe</i>	
Improving Wi-Fi Based Localization Using External Constraints .....	126
<i>Gloria Ciavarrini, Francesco Marcelloni, and Alessio Vecchio</i>	
Scaled Unscented Kalman Filter for RSSI-based Indoor Positioning and Tracking .....	132
<i>Laith Khalil and Peter Jung</i>	
A Context-Sensitive Privacy-Aware Framework for Proactive Location-Based Services .....	138
<i>Bersant Deva, Sandro Rodriguez Garzon, and Sarah Schünemann</i>	
Geographical Route Selection Based on User Public Transportation and Service Preferences .....	144
<i>Wesam Almobaideen, Maha Saadeh, Noor Al-Anbaki, Rawan Zaghloul, and Aryaf Aladwan</i>	

## **Networking**

Load Adaptive Caching Points for a Content Distribution Network .....	150
<i>Samaneh Igder, Hamdi Idjmayyel, Bilal R. Qazi, Samya Bhattacharya, and Jaafar M. H. Elmirghani</i>	
Wind Energy Dependent Rate Adaptation for Roadside Units .....	156
<i>George A. Audu, Samya Bhattacharya, and Jaafar M. H. Elmirghani</i>	
Energy-Efficient Traffic Scheduling in IP over WDM Networks .....	161
<i>Zaid H. Nasralla, Taisir E. H. El-Gorashi, Mohamed O. I. Musa, and Jaafar M. H. Elmirghani</i>	
A Communication Channels Dynamic Switching Model for Always-Connected Availability of Service Oriented Mobile Applications .....	165
<i>Diogo Azevedo, Hugo Paredes, and Benjamin Fonseca</i>	
A QoS-oriented Power and Resource Allocation Framework for Wireless Networks .....	170
<i>Rodrigo A. Vaca Ramírez and Victor Ramos</i>	
Adaptive Broadcast Cancellation Query Mechanism for Unstructured Networks .....	176
<i>Rui Lima, Carlos Baquero, and Hugo Miranda</i>	
An Autoregressive Estimator for Overhead Reduction in Substitution Networks .....	182
<i>Karen Miranda, Nathalie Mitton, and Victor Ramos</i>	
Assessment of Personal Exposure to Wireless Communication Technologies in Different Microenvironments .....	188
<i>Enver Hamiti, Mimoza Ibrani, Luan Ahma, Reze Halili, Doruntinë Berisha, and Vlerar Shala</i>	

Privacy-Enhanced Group Communication for Vehicular Delay Tolerant Networks .....	193
<i>Chibueze P. Anyigor Ogah, Haitham Cruickshank, Zhili Sun,     Ganesh Chandrasekaran, Yue Cao, Philip Michael Asuquo,     and Masoud Al Tawqi</i>	
Evaluating SIP Signaling Performance for VoIP over LTE Based Mission-Critical Communication Systems .....	199
<i>Ashraf Ali, Mazin Alshamrani, Alhad Kuwadekar, and Khalid Al-Begain</i>	
Probabilistic Offload Scheme in Integrated Cellular WiFi Systems .....	206
<i>Insook Kim and Dongwoo Kim</i>	

## **Networking and Performance**

Performance Evaluation of the Network Sustainability in Wireless Multi-hop Infrastructures with Biased User Mobility .....	211
<i>Rui Teng, Huan-Bang Li, and Ryu Miura</i>	
Performance Analysis of Dynamic Resource Allocation for Interference Mitigation in Integrated Satellite and Terrestrial Systems .....	217
<i>Unhee Park, Hee Woo Kim, Dae Sub Oh, and Dae-Ig Chang</i>	
Performance Evaluation of Massive MIMO in Correlated Rician and Correlated Nakagami-m Fading .....	222
<i>Hayder AL-Salih and Fatin Said</i>	

## **Security**

Analysis of DoS Attacks in Delay Tolerant Networks for Emergency Evacuation .....	228
<i>Philip Asuquo, Haitham Cruickshank, Zhili Sun, and Ganesh Chandrasekaran</i>	
Distributed Intrusion Detection System for Wireless Sensor Networks .....	234
<i>Karen Medhat, Rabie A. Ramadan, and Ihab Talkhan</i>	
Dynamic Location Information in Attribute-Based Encryption Schemes .....	240
<i>Iwailo Denisow, Sebastian Zickau, Felix Beierle, and Axel Küpper</i>	
Event-Driven Implicit Authentication for Mobile Access Control .....	248
<i>Feng Yao, Suleiman Y. Yerima, Boojoong Kang, and Sakir Sezer</i>	
Security for Future Software Defined Mobile Networks .....	256
<i>Madhusanka Liyanage, Ijaz Ahmed, Mika Ylianttila, Jesus Llorente Santos,     Raimo Kantola, Oscar Lopez Perez, Mikel Uriarte Itzazelaia,     Edgardo Montes de Oca, Asier Valtierra, and Carlos Jimenez</i>	
The Affect of Two Cryptographic Constructs on QoS and QoE for Unmanned Control Vehicles .....	265
<i>R. D. Sparrow, A. A. Adekunle, R. J. Berry, and R. J. Farnish</i>	
Voice Encrypted Recognition Authentication - VERA .....	270
<i>Sebastian Szłósarczyk and Andrea Schulte</i>	

A Secure Authentication and Key Agreement Protocol for Telecare Medicine Information System .....	275
<i>Xuanang Li, Zhiming Zheng, and Xiao Zhang</i>	

## Wireless Technology

Compressive Wideband Spectrum Sensing in Cognitive Radio Systems Based on Cyclostationary Feature Detection .....	282
<i>Mohammad-Ali Damavandi and Said Nader-Esfahani</i>	
Efficient Frame Aggregation with Frame Size Adaptation for Next Generation MU-MIMO WLANs .....	288
<i>Yoshihide Nomura, Kazuo Mori, and Hideo Kobayashi</i>	
LSEA: Light Weight Sector Eligibility Algorithm for k-Coverage in Wireless Sensor Networks .....	294
<i>Manel Chenait, Bahia Zebbane, Lyes Boufennara, Lotfi Haouaya, Chafika Benzaïd, and Nadjib Badache</i>	
Sensing-Throughput Tradeoff for Cognitive Radio in TV White Spaces .....	300
<i>MirMuhammad Lodro, Steve Greedy, Chris Smartt, DWP Thomas, and Ana Vukovic</i>	
Improving Data Extraction Efficiency of Cache Nodes in Cognitive Radio Networks Using Big Data Analysis .....	305
<i>Ankur Omar</i>	

## Video Communications

QoE Based P2P Scalable Video Streaming over Mobile Ad Hoc Networks .....	311
<i>Muhammad Salman Raheel, Raad Raad, and Christian Ritz</i>	
QoS KPI and QoE KQI Relationship for LTE Video Streaming and VoLTE Services .....	318
<i>Manuela Vaser and Sonia Forconi</i>	
Resource Allocation Scheme Based on Online QoE Estimation of Mobile H.264 Video Streaming .....	324
<i>Mohammed Alreshoodi, John Woods, Emad Danish, and Anil Fernando</i>	
Supporting Handover between LTE Video Broadcasting and Unicast Streaming .....	329
<i>Luis Bellido, Carlos M. Lentisco, Miguel Aguayo, and Encarna Pastor</i>	
Optimising QoE Distribution for Video Applications through LTE-WiFi Interworking .....	335
<i>Mirghiasaldin Seyedebrahimi and Xiao-Hong Peng</i>	

## Case Studies

Healthcare WSN: Cluster Elections and Selective Forwarding Defense .....	341
<i>Avijit Mathur, Thomas Newe, and Muzaffar Rao</i>	

Implicit Palm Rejection Using Real-Time Hand Model Filters on Tablet Devices .....	347
<i>Riyeth P. Tanyag and Rowel O. Atienza</i>	
User Experience Study on Folktales Mobile Application for Children's Education .....	353
<i>Norshahila Ibrahim, Wan Fatimah, Wan Ahmad, and A'fza Shafie</i>	
Lessons from Addressing Challenges in an Agricultural Extension Scheme Using Mobile Apps .....	359
<i>Nathan Amanquah and Mjumo Mzyece</i>	
 <b>ITASC 2015</b>	
Cloud and Energy Management – Issues and Concerns .....	365
<i>Peter H Shuttleworth</i>	
Cloud Security Risk Management: A Critical Review .....	370
<i>Temesgen Kitaw Damenu and Chitra Balakrishna</i>	
Efficient Control Algorithm for a Smart Solar Street Light .....	376
<i>Abhilasha Jain and Chandrasekhar Nagarajan</i>	
Is Rural Botswana Stuck to the "Chalkboard Only" Era while Others Make Strides in Mobile Learning? .....	382
<i>Lydia Maketo and Chitra Balakrishna</i>	
Smart Detection of Vehicle in Illegal Parking Area by Fusing of Multi-features .....	388
<i>Mu Chunyang, Ma Xing, and Zhang Panpan</i>	
Internet of Things and M2M Communications as Enablers of Smart City Initiatives .....	393
<i>Soumya Kanti Datta and Christian Bonnet</i>	
Using Value Added Services to Realise the Benefits of Enterprise Small Cell Deployments: Discussion and Prototype .....	399
<i>David Lake and Chitra Balakrishna</i>	
 <b>Author Index .....</b>	405