

# **10th International Conference on Future Networks and Communications (FNC 2015) /12th International Conference on Mobile Systems and Pervasive Computing (MobiSPC 2015)**

**Procedia Computer Science Volume 56**

**Belfort, France  
17-20 August 2015**

**Editors:**

**Elhadi Shadshuki  
Stephane Galland**

**Ansar-Ul-Haque Yasar**

**ISBN: 978-1-5108-0987-1**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© by Elsevier B.V.  
All rights reserved.

Printed by Curran Associates, Inc. (2015)

For permission requests, please contact Elsevier B.V.  
at the address below.

Elsevier B.V.  
Radarweg 29  
Amsterdam 1043 NX  
The Netherlands

Phone: +31 20 485 3911  
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)



ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

Procedia Computer Science 56 (2015) iii–vi

Procedia  
Computer Science

## Contents

Preface	1
Ansar-UI-Haque Yasar, S. Galland	1
Preface	4
S. Galland, H. Hassanein	4
Keynote I	7
A. Badii	7
Keynote II	8
M.-P. Gleizes	8
Proceedings MobiSPC 2015 The 12th International Conference on Mobile Systems and Pervasive Computing	9
Context-Aware Computation Offloading for Mobile Cloud Computing: Requirements Analysis, Survey and Design Guideline	10
G. Orsini, D. Bade, W. Lamersdorf	10
Business Reputation of Social Networks of Web Services	18
Z. Maamar, G. Costantino, M. Petrocchi, F. Martinelli	18
An Analysis of Features and Tendencies in Mobile Banking Apps	26
G. Fenu, P.L. Pau	26
From Apps to Liquid Multi-Device Software	34
A. Taivalsaari, T. Mikkonen	34
Weaving Risk Identification into Crowdsourcing Lifecycle	41
F. Kamoun, D. Alhadidi, Z. Maamar	41
An Adaptive User Interface in Healthcare	49
E.M. Shakshuki, M. Reid, T.R. Sheltami	49
An Anycast Communication Model for Data Offloading in Intermittently-Connected Hybrid Networks	59
A. Esnault, N. Le Sommer, F. Guidec	59
Low-Power Universal Edge Tracer Architecture Using Accuracy-Controlled Resource Reallocation for Event-Driven Sensing Applications	67
D. Park, J. Cho	67
A Practical Approach to Partition Applications in Pervasive Computing Environments	74
N.V. Jungum, N. Mohamudally, N. Nissanke	74
Context-Aware Mobile Language Learning	82
R. Morales, B. Igler, S. Böhm, P. Chitchaipoka	82
Accurate Indoor Proximity Zone Detection Based on Time Window and Frequency with Bluetooth Low Energy	88
D.-Y. Kim, S.-H. Kim, D. Choi, S.-H. Jin	88
Spatio-Temporal Planning for Mobile Ambient Agents	96
R. Boukharrou, J.-M. Ilić, D.E. Saïdouni	96
Content-aware Image Retargeting for Image Display on Foldable Mobile Devices	104
L.-W. Kang, M.-F. Weng, C.-L. Jheng, C.-Y. Tseng, S.K. Ramesh, A. Gureja, H.-C. Hsu, C.-H. Yeh	104
An Intelligent ETL Grid-Based Solution to Enable Spatial Data Warehouse Deployment in Cyber Physical System Context	111
B. Boulekrouche, N. Jabeur, Z. Alimazighi	111
A Robust Human-Robot Communication System Using Natural Language for HARMS	119
A.R. Wagoner, E.T. Matson	119
An Adaptive Task-Based Model for Autonomous Multi-Robot Using HARMS and NuSMV	127
Y. Kim, J.-W. Jung, E.T. Matson	127
HARMS-based Service Discovery Protocol Using Address-DNS	133
K. Lee, Y. Yeo, T.-M. Chung	133
Analysis and Development of Agent Architecture for Pest Control Systems	139
A.A. Kuandykov, R.K. Uskenbayeva, Y.I. Cho, D.K. Kozhamzharova, O.A. Baimuratov, N. Karimzhan, Y. Chinibayev	139
Integrating of Data Using the Hadoop and R	145
R. Uskenbayeva, A. Kuandykov, Y.I. Cho, T. Temirbolatova, S. Amanzholova, D. Kozhamzharova	145
A Shadow Removal Method for a Mobile Robot Localization Using External Surveillance Cameras	150
J.-H. Shim, Y.-I. Cho	150
On Constructing Minimum 2-Connected 2-Dominating Set with Maximum Spectrums in Cognitive Radio Networks	156
L. Han, D. Fu, Z. Yang, Q. Gao, Z. Feng	156
An Efficient Centralized Algorithm for Connected Dominating Set on Wireless Networks	162
D. Fu, L. Han, L. Liu, Q. Gao, Z. Feng	162

Towards the Dynamic Evaluation of a Public Bus Network for Small Size Urban Environments O. Lamotte, N. Gaud, S. Galland . . . . .	168
A Model of Virtual Training Application for Simulation of Technological Processes B. Mukhanov, Z. Omirbekova, M. Alimanova, S. Jumadilova, D. Kozhamzharova, O. Baimuratov . . . . .	177
Designing a Data Management Pipeline for Pervasive Sensor Communication Systems J. Ronkainen, A. Iivari . . . . .	183
An Energy-Efficient and Robust Indoor-Outdoor Detection Method Based on Cell Identity Map Z. Liu, H. Park, Z. Chen, H. Cho . . . . .	189
Proceedings FNC 2015 The 10th International Conference on Future Networks and Communications . . . . .	196
Formalization of the Behavior of Content-Centri Networking S. Moriguhi, T. Morishima, M. Goto, K. Takahashi . . . . .	197
SSMA <sub>B</sub> : A Slotted Sense Multiple Access Broadcasting Protocol for Dynamic Wireless Sensor Networks M.T. Van, H. Oh . . . . .	205
Information Security Management in Saudi Arabian Organizations M. Alsaif, N. Aljaafari, A.R. Khan . . . . .	213
Adding Support for Delay Tolerance to IPv6 Networks T. Ward, K. Martinez, T. Chown . . . . .	217
Satisfying QoS Requirements in NGN Networks Using a Dynamic Adaptive Queuing Delay Control Method C. Ghazel, L. Saïdane . . . . .	225
Distributed Workload Control for Federated Service Discovery V. Suraci, C.G. Giorgi, S. Battilotti, F. Facchinei . . . . .	233
HTTP/2 and QUIC for Virtual Worlds and the 3D Web? H. Bakri, C. Allison, A. Miller, I. Oliver . . . . .	242
Combining Bond Graphs and Petri Nets Formalism for Modeling Hybrid Dynamic Systems M. Bouhalouane, S. Larbi, H. Haffaf . . . . .	252
Free Space Optics Attenuation Model for Visibilities Ranging from 9 to 12 Km A.D. Kora, R. Hontinfinde, T. Ouattara . . . . .	260
A Context-based Future Network Infrastructure for IoT Services W.S. Chin, H.-s. Kim, Y. Ju Heo, Ju Wook Janga . . . . .	266
A Work in Progress: Context based Encryption Scheme for Internet of Things J. Lee, S. Oh, Ju Wook Janga . . . . .	271
Distributed Control in Virtualized Networks L. Zuccaro, F. Cimorelli, F.D. Priscoli, C.G. Giorgi, S. Monaco, V. Suraci . . . . .	276
A Lightweight Data Interchange Format for Internet of Things in the PalCom Middleware Framework. M. Nordahl, B. Magnusson . . . . .	284
A Memory Efficient DFA Using Compression and Pattern Segmentation Y.-K. Chang, Y.-S. Li, Yu-To Chen . . . . .	292
A Study on Turbo Coded 16-QAM Bit Allocation in Rice flat Fading Channel K. Maria, B. Horia . . . . .	300
Energy-Aware Topology Control and Qos Routing In Ad-Hoc Networks F. Yakine, A. Idrissi . . . . .	309
Similarity Flooding for Efficient Distributed Discovery of OWL-S Process Model in P2P Networks A. Boukhadra, K. Benatchba, A. Balla . . . . .	317
Drilling Data Management in Petroleum Industry based on RTPS B. Almadani . . . . .	325
Al-Yad: A Wearable Sensor Network over DDS Middleware for Industrial Application B. Almadani, F.M. Aliyu, E.M. Shakshuki . . . . .	333
SPA: Smart Placement Approach for Cloud-service Datacenter Networks A.N. Quttoum, M. Tomar, B. Khawaldeh, R. Refai, A. Halawani, A. Freej . . . . .	341
Real-Time QoS-Aware Vehicle Tracking: An Experimental and Comparative Study B. Almadani, A.A. Mamun, A. Khayyat . . . . .	349
Building a Simulation-in-the-loop Sensor Data Testbed for Cloud-enabled Pervasive Applications A. Iivari, J. Ronkainen . . . . .	357
Towards a Novel Optical Access Networks Management Solution: Addressing General Management Complexity T. Gonçalves, K. Baras, L. Brito . . . . .	363
MobiSPC & FNC Workshops 2015 . . . . .	369
Privacy Levels for Computer Forensics: Toward a More Efficient Privacy-preserving Investigation W. Halboob, R. Mahmood, N.I. Udzir, M.T. Abdullah . . . . .	370
Survey on Mobile User's Data Privacy Threats and Defense Mechanisms J. Khan, H. Abbas, J. Al-Muhtadi . . . . .	376
Analysis of Detection Features for Wormhole Attacks in MANETs M. Imran, F.A. Khan, T. Jamal, M.H. Durad . . . . .	384

Methodological Framework for NoC Resources Dimensioning on FPGAs V. Fresse, C. Combes, M. Payet, F. Rousseau . . . . .	391
FaFNoC: A Fault-tolerant and Bufferless Network-on-chip A. Runge . . . . .	397
The Impact of Traffic Localisation on the Performance of NoCs for Very Large Manycore Systems S.A. Khanjari, W. Vanderbauwhede . . . . .	403
Shortest Path Routing Algorithm for Hierarchical Interconnection Network-on-Chip O. Inam, S.A. Khanjari, W. Vanderbauwhede . . . . .	409
An Improved Wireless Communication Fabric for Emerging Network-on-Chip Design M.O. Agyeman, K. Tong, T. Mak . . . . .	415
Design Trade off and Performance Analysis of Router Architectures in Network-on-Chip J. Latif, H.N. Chaudhry, S. Azam, N.K. Baloch . . . . .	421
Robust Digital Retrodirective Beamforming Technique for Multipath Channel Environment C. An, K. Jang, H.-G. Ryu, J. Choi, H. Cho . . . . .	427
”Mobile Holistic Enterprise Transformation Framework” M.M. Alqahtani, A.S. Atkins, C. Stanier . . . . .	433
Lessons Learned from Context Aware Service Experiences in the Real World I. Satoh . . . . .	441
Smart Tourism in 1-Click F. Zacarias, R. Cuapa, G. De Ita, D. Torres . . . . .	447
Representing Security Specifications in UML State Machine Diagrams M.U. Khan . . . . .	453
Open Source Software (OSS) Quality Assurance: A Survey Paper S.S. Bahamdain . . . . .	459
Reducing Phase Cancellation Effect with ASK-PSK Modulated Stamp in Augmented UHF RFID Indoor Localization System J. Wang, M. Bolic . . . . .	465
A Context-Aware Mobile User Behavior based Preference Neighbor Finding Approach for Personalized Information Retrieval Q. Gao, X. Dong, D. Fu . . . . .	471
Multi-Agent Based Anti-Locust Territory Protection System A. Kuandykov, R. Uskenbayeva, Y.I. Cho, D. Kozhamzharova, O. Baimuratov, Y. Chinibayev, N. Karimzhan . . . . .	477
Semantic Reasoning Method for the Target Image Based on Probability Model S. Xi, X. Ren, Q. Gao . . . . .	484
Analyze Cost-Efficient System for Small UAS Tracking Using Agent-Based Modeling S. Shin, S. Park, Y. Kim, E.T. Matson . . . . .	490
A Study about Sound Quality for Violin Playing Robot H. Park, W. Jo, K. Choi, H. Jung, Y. Jargalbaatar, B.-J. Lee, D. Kim . . . . .	496
A Mobile Robot Localization Using External Surveillance Cameras at Indoor J.-H. Shim, Y.-I. Cho . . . . .	502
Theory, Methodology, and Implementation of Robotic Intelligence and Communication V. Raskin . . . . .	508
Mapping Human Understanding to Robotic Perception J.M. Taylor . . . . .	514
An Analysis and Prototyping Approach for Cyber-Physical Systems S. Deniaud, P. Descamps, V. Hilaire, O. Lamotte, S. Rodriguez . . . . .	520
A New Perspective on Multi-Agent Environment with SARL S. Rodriguez, S. Galland, N. Gaud . . . . .	526
Data Collection and Analysis Using the Mobile Application for Environmental Monitoring B. Akhmetov, M. Aitimov . . . . .	532
Self-Management Technique for Adaptive Robot Software based on Task Environment Similarity Y. Son, J.-W. Jung . . . . .	538
AEGIS App: Wildfire Information Management for Windows Phone Devices N. Athanasias, F. Karagiannis, P. Palaiologou, C. Vasilakos, K. Kalabokidis . . . . .	544
Using Internet of Things technologies for a collaborative supply chain: Application to tracking of pallets and containers Z.D.R. Gnimpieba, A. Nait-Sidi-Moh, D. Durand, J. Fortin . . . . .	550
A Recommendation Approach to Enhance the Interoperability between Spatial Datacubes S. Aissi, T. Sboui, M.S. Gouider, M.A.B. Hassine, L.B. Said . . . . .	558
Integrating Multiple Geometric Representations within Spatial Data Warehouse Structures for Enhanced Collaborative Decision-Making Processes B. Boulekrouche, H. Haddad, N. Jabeur, Z. Alimazighi . . . . .	566
Ad Hoc Cloud as a Service: A Protocol for Setting up an Ad hoc Cloud over MANETs B. Zaghdoudi, H.K.-B. Ayed, I. Riabi . . . . .	573
AMCC: Ad-hoc based Mobile Cloud Computing Modeling M. AL-Rousan, E. AL-Shara, Y. Jararweh . . . . .	580

An Enhanced Secure Mobility Management Scheme for Building IoT Applications H.-S. Chai, J.-Y. Choi, J. Jeong .....	586
The Internet of Energy: Smart Sensor Networks and Big Data Management for Smart Grid M. Jaradat, M. Jarrah, A. Bouselham, Y. Jararweh, M. Al-Ayyoub .....	592
Wireless Sensor Networks for the Surveillance of Wide Date Palm Forests: (Specification and Verification Levels) L. Kahloul .....	598
An Operational Semantics for UML 2 Sequence Diagrams Supported by Model Transformations N. Messaoudi, A. Chaoui, M. Bettaz .....	604
A Framework for Modeling and Analysis UML Activity Diagram Using Graph Transformation Y. Rahmoune, A. Chaoui, E. Kerkouche .....	612
Experimental Evaluation of Safety Beacons Dissemination in VANETs S.M. Shakeel, M. Ould-Khaoua, O.M. Hussain Rehman, A. Al Maashri, H. Bourdoucen.....	618