2012 Seventh International Conference on Broadband, Wireless Computing, Communication and Applications

(BWCCA 2012)

Victoria, British Columbia, Canada
12 – 14 November 2012

IEEE

IEEE Catalog Number: CFP1298K-PRT
ISBN: 978-1-4673-2972-9

2012 Seventh International Conference on Broadband, Wireless Computing, Communication and Applications

BWCCA 2012

Table of Contents

Message from BWCCA 2012 International Conference Organizers xviii

Message from BWCCA 2012 International Conference Workshop Co-chairs xx

BWCCA 2012 Organizing Committee xxi

BWCCA 2012 Program Committee xxiii

BWCCA 2012 Reviewers xxvi

Keynote Talks xxvii

Message from ASTSA 2012 International Workshop Organizers xxviii

ASTSA 2012 Organizing Committee xxix

ASTSA 2012 Reviewers xxx

Message from BioSPAN 2012 Workshop Co-chairs xxxi

BioSPAN 2012 Organizing Committee xxxii

BioSPAN 2012 Reviewers xxxiii

Message from CWECS 2012 International Workshop Organizers xxxiv

CWECS 2012 Organizing Committee xxxv

CWECS 2012 Reviewers xxxvi

Message from MAPWC 2012 International Workshop Organizers xxxvii

MAPWC 2012 Organizing Committee.....xxxviii
MAPWC 2012 Reviewers.....xxxix
Message from MNSA 2012 International Symposium Co-chairs.....xl
MNSA 2012 Organizing Committee.....xli
MNSA 2012 Reviewers.....xlii
Message from NGWMN 2012 International Workshop Co-chairs.....xliii
NGWMN 2012 Organizing Committee.....xliv
NGWMN 2012 Reviewers.....xlv
Message from NTCAA 2012 Workshop Co-chairs.....xlvi
NTCAA 2012 Organizing Committee.....xlvii
NTCAA 2012 Reviewers.....xlviii
Message from SCMAS 2012 International Workshop Organizers.....xlvix
SCMAS 2012 Organizing Committee.....l
SCMAS 2012 Reviewers.....li

BWCCA 2012

Session 1: Wireless Sensor Networks

Data Transmission Strategies for Event Reporting and Continuous Monitoring Applications in Wireless Sensor Networks 1
Israel Leyva Mayorga, Mario E. Rivero-Angeles, Claudia C. Gutierrez-Torres, Jose A. Jimenez-Bernal, Ramsés Rodríguez, and Alma Torres-Rivera

DominoMAC: A Wireless Sensor Networks Medium Access Protocol 8
Fayez Gebali, Rami Sulaimani, and Haytham Elmiligi

Simulated Annealing for Maximizing the Lifetime of Sensor Networks under Opportunistic Routing 14
Samia Chelloug and Mohammed Benmohammed

Dynamic Change Method of Cluster Size in WSN 20
Shinnosuke Toyoda and Fumiaki Sato

Session 2: Wireless Communication Systems I

Strength Based Receiver Architecture and Communication Range and Rate Dependent Signal Detection Characteristics of Concentration Encoded Molecular Communication 28
Mohammad Upal Mahfuz, Dimitrios Makrakis, and Hussein T. Mouftah

Multi-user Interference Mitigation in TH-PPM UWB Systems 36
Hao Zhang, Hongjiao Zhang, Xuerong Cui, and T. Aaron Gulliver

Performance Analysis of Cognitive Transmission in Dual-Cell Environment and its Application to Smart Meter Communications 40
Hong-Chuan Yang, Dong Zhang, Xiangyu Kong, and Hongjie Jia

Simulation Analysis of IEEE 802.15.4 Non-beacon Mode at Varying Data Rates 46
Z. Abbas, N. Javaid, M.A. Khan, S. Ahmed, U. Qasim, and Z.A. Khan

Session 3: Ad-Hoc Networks

Setting Up Static Components for Investigating MANET Performance: A Simulation Case 53
Elis Kulla, Masahiro Hiyama, Makoto Ikeda, Leonard Barolli, Kazunori Uchida, and Makoto Takizawa

Performance Evaluation of a MANET Testbed in Heterogeneous Environment: Experimental Results 60
Masahiro Hiyama, Elis Kulla, Makoto Ikeda, and Leonard Barolli

Geographical Multi-Channel Multi-Interface Routing Protocol for Mobile Ad Hoc Network 66
Saman Hameed Amin and H.S. Al-Raweshidy

Session 4: P2P Networks

Reputation Aggregation Method Considering Reliability of Newly Joining Peers in Unstructured P2P Networks 74
Takashi Yajima, Hiroki Ushikubo, and Hiroshi Shigeno

Design of GeoConscious P2P Content-based Image Retrieval 82
Junzo Kamahara, Naoki Tanaka, Katsutoshi Hirayama, Takashi Nagamatsu, Yuuichi Teranishi, and Yusuke Ariyoshi

Performance Comparison of Peer-to-Peer Content Distribution Schemes 88
Francisco de Asís López-Fuentes

Session 5: Vehicular Networks

CoR-VANETs: Game Theoretic Approach for Channel and Rate Selection in Cognitive Radio VANETs 94
Danda B. Rawat, Bhed B. Bista, and Gongjun Yan

Performance Analysis of Random Access Strategies for Short Message Exchange in VANETs: A Social Approach 100
Néstor E. Hernández-Atonal, Fernando Martínez-Piñón, and Mario E. Rivero-Angeles

Performance of OLSR and DSDV Protocols in a VANET Scenario: Evaluation Using CAVENET and NS3 108
Evjola Spaho, Makoto Ikeda, Leonard Barolli, Fatos Xhafa, Muhammad Younas, and Makoto Takizawa

Jamming Strategies in DYMO MANETs: Assessing Detectability and Operational Impacts 114
Deepali Arora, Eamon Millman, and Stephen W. Neville

Session 6: Wireless Communication Systems II

Minimum Cell Size for Information Capacity Increase in a Shadowed Environment of Cellular System Operating at Higher Carrier Frequency 122
K.A. Anang, P.B. Rapajic, R. Wu, G. Oletu, L. Bello, and T.I. Eneh

Adaptive Path Ranking Technique for Maximization of Gains of Bandwidth Aggregation over Heterogeneous Wireless Links 127
Syed Zubair Ahmad, Muhammad Abdul Qadir, and Samiullah Khan

Performance of DPPM 60 GHz Impulse Radio Systems with Multiple Receive Antennas 135
Hao Zhang, Lingwei Xu, Tingting Lu, Jingjing Wang, and T. Aaron Gulliver

Session 7: Network Protocols

Multimedia Quorum-based Synchronization Protocols 141
Tadateru Ohkawara, Ailixier Aikebaier, Tomoya Enokido, and Makoto Takizawa

Routing Load of Route Calculation and Route Maintenance in Wireless Proactive Routing Protocols 149
D. Mahmood, N. Javaid, U. Qasim, and Z.A. Khan

Multiple Station Aggregation Procedure for Radio-On-Demand WLANs 156
Kazumi Kumazoe, Daiki Nobayashi, Yutaka Fukuda, Takeshi Ikenaga, and Kenichi Abe

Session 8: Wireless Sensor Networks and Body Area Networks

On Performance Evaluation of Variants of DEEC in WSNs 162
T.N. Qureshi, N. Javaid, M. Malik, U. Qasim, and Z.A. Khan

Data Forwarding Method Based on Status of Connection with Multiple Mobile Sinks in Wireless Sensor Networks 170
Akimitsu Kanzaki, Ayana Yamamoto, Takahiro Hara, and Shojiro Nishio

QPRD: QoS-aware Peering Routing Protocol for Delay Sensitive Data in Hospital Body Area Network Communication 178
Zahoor Khan, Shyamala Sivakumar, William Phillips, and Bill Robertson

Modeling Propagation Characteristics for Arm-Motion in Wireless Body Area Sensor Networks 186
Q. Ain, A. Ikram, N. Javaid, U. Qasim, and Z.A. Khan

Session 9: Energy-Aware Algorithms and Systems

Evaluation of the Algorithms for Selecting an Energy-efficient Storage Server in Storage and Computation Oriented Applications 192
Takuro Inoue, Ailixier Aikebaier, Tomoya Enokido, and Makoto Takizawa

Transmission Power Consumption Laxity-Based (TPCL) Algorithm for Communication Type Applications 200
Tomoya Enokido and Makoto Takizawa

Energy-Efficient Multiuser MIMO Downlink Transmissions in Massively Distributed Antenna Systems with Predefined Capacity Constraints 208
Saad Mahboob, Chinmaya Mahapatra, and Victor C.M. Leung

Algorithm and Convergence of MST Problem for Energy Efficient Routing in Wireless Sensor Networks 212
Rui Yang, Tiande Guo, and Wenguo Yang

Session 10: Wireless Transmission Systems

Symbol Error Rate Analysis of MIMO Dual-Hop Amplify-and-Forward Relaying Systems with Transmit and Receive Beamforming 220
Xiao-bo Guo, Min Li, Ying Li, and Li-Feng Wang

Transmit Antenna Selection for Downlink Transmission in a Massively Distributed Antenna System Using Convex Optimization 228
Saad Mahboob, Rukhsana Ruby, and Victor C.M. Leung

Cooperative Spectrum Sensing over κ-μ Fading Channel 234
Alireza Bagheri and Ali Shahzadi

Performance of Incremental DF Cooperative Networks with the Nth Best-Relay over Identical Rayleigh Fading Channels 239
Zhang Hao, Wang Xinjie, Wang Jingjing, and T. Aaron Gulliver

Session 11: Multimedia Processing and Applications

Characterizing Videos and Users in YouTube: A Survey 244
Shaiful Alam Chowdhury and Dwight Makaroff

Implementation of Imaging Compressive Sensing Algorithms on Mobile Handset Devices 252
Irene L. Manotas Gutiérrez, Henry Arguello Fuentes, and Kristina Winbladh

Analyzing City Blocks' Properties Based on Mobile Data 260
Weifeng Lv, Kan Liu, and Tongyu Zhu

Session 12: Privacy and Trust Computing

Trust Based Security Mechanisms for Social Networks 264
Ping Zhang, Arjan Durresi, Yefeng Ruan, and Mimoza Durresi

Who Refuses to Wash Hands? Privacy Issues in Modern House Installation Networks 271
Thomas Mundt, Frank Krüger, and Till Wollenberg

An Integrated Fuzzy-based Trustworthiness System for P2P Communications in JXTA-Overlay 278
Kouhei Umezaki, Evjola Spaho, Leonard Barolli, Fatos Xhafa, Muhammad Younas, and Jiro Iwashige

Session 13: Optical Systems

Investigation of Polarization Mode Dispersion Influence to Different Optical Signal Modulation Formats 285
Jurgis Porins, Girts Ivanovs, Andis Supe, and Gunars Cauna

A Routing Algorithm for Rearrangeable Nonblocking Optical Banyan-type Networks 289
D.J. Guan, Li-Da Tong, and Irene Ya-Ping Chen

Reach Improvement of Spectrum-Sliced Dense WDM-PON System 296
Sandis Spolitis, Vjaceslavs Bobrovs, and Girts Ivanovs

Space to Ground Optical Power Transmission 302
A. Jooshesh, T.A. Gulliver, and S. Uysal

Session 14: Multimedia Tools and Systems

User Preference Profiling Based on Speech Recognition for Personalized Recommendation 308
Kosuke Takano, Hiroshi Honda, and Kin Fun Li

A Handy Image Explorer with Tactile Feedback for Diagnostic Imaging 316
Jiaqing Lin, Hiroaki Nishino, Tsuneo Kagawa, and Kouichi Utsumiya

Exploitation of Mobile Access to Context-Based Information in Cultural Heritage Fruition 322
Salvatore Andolina, Dario Pirrone, Giuseppe Russo, Salvatore Sorce, and Antonio Gentile

Performance Evaluation of Multi-pattern Matching Algorithms on Smartphone 329
Abdelfattah Amamra, Chamseddine Talhi, and Jean-Marc Robert

Session 15: Cognitive Radio Networks and Mesh Networks

Prioritized Proactive Scheme for Spectrum Handoff Decision in Cognitive Radio Networks 335
Salah Zahed, Irfan Awan, and Geyong Min

Proposal of Autonomous Cloud Based Network Control Methods for Disaster Information Network System with Cognitive Wireless Network 342
Noriki Uchida, Kazuo Takahata, and Yoshitaka Shibata

Comparison of Spectrum Management without Game Theory (SMWG) and with Game Theory (SMG) for Network Performance in Cognitive Radio Network 348
Saed Alrabaee, Anjali Agarwal, Nishith Goel, Marzia Zaman, and Mahmoud Khasawneh

Genetic Algorithms for Node Placement in WMNs: Effect of Changes in Population Size and Number of Generations 356
Tetsuya Oda, Admir Barolli, Evjola Spaho, Leonard Barolli, Fatos Xhafa, and Jiro Iwashige

ASTSA 2012

Session 1: Sensors and Applications

Ceramic Humidity Sensors for Environmental Parameters Monitoring 362
Rodrigo de Matos Oliveira, Maria do Carmo de Andrade Nono, and Celso von Randow

Smart Clustering for Multimodal WSNs 367
Fady Medhat, Rabie A. Ramadan, and Ihab Talkhan

HSEP: Heterogeneity-aware Hierarchical Stable Election Protocol for WSNs 373
A.A. Khan, N. Javaid, U. Qasim, Z. Lu, and Z.A. Khan

Session 2: Protocols and Algorithms

Supporting Communication in Time of Disaster 379
Takashi Iokawa, Yuhiro Yonamine, Jiahong Wang, Eiichiro Kodama, and Toyoo Takata

An Error Control Scheme for Delay Constrained Data Communication in a Chain-Based Wireless Sensor Network 385
Zahra Taghikhaki, Nirvana Meratnia, and Paul J.M. Havinga

Evaluation of Slotted CSMA/CA of IEEE 802.15.4 391
A.N. Alvi, S.S. Naqvi, S.H. Bouk, N. Javaid, U. Qasim, and Z.A. Khan

BioSPAN 2012

Session 1: Bio-Sensing, Processing, Application and Networking I

GPS Waypoint Application 397
Kris Koiner, Haytham Elmiligi, and Fayez Gebali

ABLE Transit: A Mobile Application for Visually Impaired Users to Navigate Public Transit 402
Naomi Harrington, Laura Antuña, and Yvonne Coady

Analytical Survey of Wearable Sensors 408
A. Rehman, M. Mustafa, N. Javaid, U. Qasim, and Z.A. Khan

Session 2: Bio-Sensing, Processing, Application and Networking II

Introducing GlucoFit: An Assistive Technology for Monitoring and Managing Diabetes 414
Bryan Gislason, Christopher Mcknight, Brianna Potvin, Sean Stuart, Juan Zepeda, Jens Weber, and Haytham Elmiligi

Motion Tracking and Learning in Telerehabilitation Applications 420
Ana-Maria Sevcenco and Kin Fun Li

Transmission Delay of Multi-hop Heterogeneous Networks for Medical Applications 428
M.M. Yaqoob, I. Israr, N. Javaid, M.A. Khan, U. Qasim, and Z.A. Khan

A Comprehensive Survey of MAC Protocols for Wireless Body Area Networks 434
A. Rahim, N. Javaid, M. Aslam, Z. Rahman, U. Qasim, and Z.A. Khan

CWECS 2012

Session 1: Computer Security and Confidentiality

Structuring Reconfigurable Composite Signature Codecs to Enhance OCDMA Network Confidentiality 440
Jen-Fa Huang, Chung-Yu Li, Kai-Sheng Chen, and Tsing Zhang

New Security Perspectives around BYOD 446
Antonio Scarfo

The IPSec Security Problems and a Cross-layer Security Mechanism for PMIPv6 Handover when an IPSec Security Association is Established on an L2 Direct Link 452
Fang-Yie Leu, Yi-Li Huang, and Chien-Nan Chen

A CAPTCHA with Tips Related to Alphabets Upper or Lower Case 458
Wei-Bin Lee, Che-Wei Fan, Kevin Ho, and Chyi-Ren Dow

Session 2: Distributed Systems and Applications

Controlling Traffic Lights for Ambulances 462
Fang-Yie Leu, Miao-Heng Chen, Yi-Li Huang, and Chung-Chi Lin

Routing Protocols with Power Saving and Data Salvation for Wireless Sensor Networks 468
Chu-Hsing Lin, Hung-Yan Lin, and Wei-Bin Lee

A SWE-Based Network Management Framework for Environment Monitoring 472
Chyi-Ren Dow, Ruei-Yu Hu, Yu-Hong Lee, Shiow-Fen Hwang, and Wei-Bin Lee

A Study of Virtual Machine Development 478
Wuu-Yee Chen and Yuan-Kan Lu

MAPWC 2012

Session 1: Wireless Communication

Relation between Discrete Points of DRTM and Diffraction Points 482
Masafumi Takematsu, Kazunori Uchida, and Junichi Honda

Field Distributions of 1-Ray Model Using Estimated Propagation Parameters in Comparison with DRTM 488
Kazunori Uchida, Masafumi Takematsu, Jun-Hyuck Lee, and Junichi Honda

Numerical and Experimental Study on Y-Shaped Branch by Post Array Waveguide 494
Hiroshi Maeda, Kazuya Tomiura, Huili Chen, and Takuya Shinohara

Session 2: Wireless Networks

Performance Evaluation of WMN Considering Number of Connections Using NS-3 Simulator 498
Makoto Ikeda, Tetsuya Oda, Elis Kulla, Masahiro Hiyama, Leonard Barolli, and Muhammad Younas

Performance Evaluation of WSNs for MAC and Routing Protocols Considering Depletion and Routing Efficiency Metrics 503
Tao Yang, Elis Kulla, Tetsuya Oda, Leonard Barolli, Muhammad Younas, and Makoto Takizawa

Routing Load of Route Discovery and Route Maintenance in Wireless Reactive Routing Protocols 511
D. Mahmood, N. Javaid, U. Qasim, and Z.A. Khan

MNSA 2012

Session 1: Wireless and Mobile Networks

An Extension of Wireless Internet-Access Mesh Network Simulator for Use of Smart Antenna 517
Nobuo Funabiki, Shigeto Tajima, Teruo Higashino, Toru Nakanishi, and Kan Watanabe

Impact of Population Size and Number of Generations on the Performance of Dense WMNs 523
Admir Barolli, Tetsuya Oda, Evjola Spaho, Leonard Barolli, Fatos Xhafa, and Makoto Takizawa

Using Data Replication for Improving QoS in MANETs 529
Elis Kulla, Evjola Spaho, Fatos Xhafa, Leonard Barolli, and Makoto Takizawa

A Unique Global Mobile Network Service Tracker and User Centric Data Analyser 534
Muhammad Bilal, Irfan Awan, Steve Mockford, and Asfand e-Yar

Session 2: Distributed Systems and Applications

Design Pattern Usage in Grid Computing 540
Markus Aleksy, Makoto Takizawa, and Leonard Barolli

Platforms for Human-Human Interaction in Large Social Events 545
Dario Pirrone, Salvatore Andolina, Antonella Santangelo, Antonio Gentile, and Makoto Takizava

Concept of the Support System for Operation and Management of DACS System 552
Kazuya Odagiri, Shogo Shimizu, Makoto Takizawa, and Naohiro Ishii

Flapping RADIUS Accounting Server Behavior with Toggle-Timer 558
Rohan V. Deshmukh

Session 3: Network Applications

A Redundant Power Consumption Laxity-Based (RPCLB) Algorithm for Computation Type Applications 562
Tomoya Enokido, Ailixier Aikebaier, and Makoto Takizawa

Communication Protocols in Layered Groups with Heterogeneous Clocks 568
Dilawaer Duolikun and Makoto Takizawa

Demonstration of a Novel OCDMA Based PON System for Next-Generation Fiber Optic Communication 573
Nadia Nowshin, A.K.M. Arifuzzman, Mohammed Tarique, and A.B.M. Siddique Hossain

A Density Mapping Algorithm for Supporting Cyber Foraging Service Networks 578
Manjinder Nir and Ashraf Matrawy

The Evaluations of 2P-3D Orthogonal RAIDs in Virtual Large-Scale Disks 584
Minoru Uehara

NGWMN 2012

Session 1: Algorithms and Systems

A Grey Prediction Based Hard Handover Hysteresis Algorithm for 3GPP LTE System 590
Hsing-Chung Chen and Yagus Cahyadi

A Secure E-Voting System Based on RSA Time-Lock Puzzle Mechanism 596
Hsing-Chung Chen and Rini Deviani

Simulation Analysis of Medium Access Techniques 602
I. Israr, M.M. Yaqoob, N. Javaid, U. Qasim, and Z.A. Khan

Monitoring and Controlling Power Using Zigbee Communications 608
N. Javaid, A. Sharif, A. Mahmood, S. Ahmed, U. Qasim, and Z.A. Khan

Session 2: Wireless Networks

Routing Management Algorithm Based on Spectrum Trading and Spectrum Competition in Cognitive Radio Networks 614
Saed Alrabaee, Anjali Agarwal, Nishith Goel, Marzia Zaman, and Mahmoud Khasawneh

Performance Analysis of Hierarchical Routing Protocols in Wireless Sensor Networks 620
K. Latif, M. Jaffar, N. Javaid, M.N. Saqib, U. Qasim, and Z.A. Khan

Analyzing Energy-Efficiency and Route-Selection of Multi-level Hierarchal Routing Protocols in WSNs 626
M.S. Fareed, N. Javaid, S. Ahmed, S. Rehman, U. Qasim, and Z.A. Khan

Optimal Number of Cluster Head Selection for Efficient Distribution of Sources in WSNs 632
M.S. Fareed, N. Javaid, M. Akbar, S. Rehman, U. Qasim, and Z.A. Khan

NTCAA 2012

Session 1: Network Application and Security

A Practical Method for Forecasting the Future Calendar Events of Ambiguous Recurrence 638
Hideto Yoshii, Yoshinari Nomura, and Hideo Taniguchi

Computational Complexity of Anomaly Detection Methods 644
Shunsuke Oshima and Takuo Nakashima

Token-based Code Clone Detection Technique in a Student's Programming Exercise 650
Mai Iwamoto, Shunsuke Oshima, and Takuo Nakashima

Multiple Active Queue Management within Input/Output Buffers 656
Fumihiko Nakamura and Takuo Nakashima

Hierarchical Annotation Management Method for Activity Information Collecting System 662
Yuichi Hattori, Shota Tanaka, and Sozo Inoue

SCMAS 2012

Session 1: Agent Technology and Symbiotic Computing

Circulation Mechanism of Multiagent System Based on Agent Repository 668
Takahiro Uchiya, Ichi Takumi, and Tetsuo Kinoshita

Enhancement of Repository Based Agent Framework for Ubiquitous Environment 673
Naoya Tatematsu, Takahiro Uchiya, Ichi Takumi, and Tetsuo Kinoshita

Design Environment of Reinforcement Learning Agents for Intelligent Multiagent System 679
Sho Itazuro, Takahiro Uchiya, Ichi Takumi, and Tetsuo Kinoshita

A Structured Overlay Network for Aggregating Sensor Data 684
Atsushi Takeda, Takuma Oide, and Akiko Takahashi

Green-Oriented Network Management: Towards Symbiosis
between Information Systems and Nature 690
Satoru Izumi, Takuo Suganuma, and Norio Shiratori

Author Index 695