

2016 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2016)

**Vancouver, British Columbia, Canada
15-18 May 2016**

Pages 631-1269



**IEEE Catalog Number: CFP16758-POD
ISBN: 978-1-4673-8722-4**

**Copyright © 2016 by the Institute of Electrical and Electronics 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:	CFP16758-POD
ISBN (Print-On-Demand):	978-1-4673-8722-4
ISBN (Online):	978-1-4673-8721-7
ISSN:	0840-7789

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
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Program

2016 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)

Radiation Effects In Microelectronics and Mitigation Techniques

- A Review of Xilinx Field Programmable Gate Array Radiation Effects Performance

David Hiemstra (MDA, Canada) 1

- Radiation Hardened Pulsed-Latches in 65-nm CMOS

Manoj Sachdev (University of Waterloo, Canada), Jaspal Shah (University of Waterloo, Canada) 5

- Detailed Analysis of Radiation-Induced Delays on I/O Blocks of an SRAM-Based FPGA

Claude Thibeault (Ecole de Technologie Superieure, Canada), Fatima Tazi (Ecole de Technologie Superieure, Canada), Yvon Savaria (École Polytechnique de Montréal, Canada) 9

- Single Photon Absorption Laser Facility for Single Event Effect Testing

Michael Newton (University of Saskatchewan, Canada), Brook Danger (Saskatchewan Structural Sciences Centre, Canada), Li Chen (University of Saskatchewan, Canada), Ramaswami Sammynaiken (Saskatchewan Structural Sciences Centre, Canada), Haibin Wang (University of Saskatchewan, Canada), Dave Hiemstra (MDA, Canada), Valeri Kirischian (MDA, Canada) 14

- Total Ionizing Dose Test Facilities for Micro-Electronic Circuits

Haibin Wang (University of Saskatchewan, Canada), Rui Liu (University of Saskatchewan, Canada), Xuantian Li (University of Saskatchewan, Canada), Li Chen (University of Saskatchewan, Canada), Dave Hiemstra (MDA, Canada), Valeri Kirischian (MDA, Canada) 19

Cognitive Radio

- Optimization of Probability of Error in Collaborative Spectrum Sensing of Time-Limited Cognitive Radio Networks

Mohammad Hassan Adeli (Imam Khomeini International University, Iran), Fariba Mohammadian (Qazvin International University, Iran), Abbas Taherpour (Imam Khomeini International University, Iran), Tamer Khattab (Qatar University, Qatar) 23

- Opportunistic Multi-channel MAC protocol for Cognitive Radio Networks

Mohamed G. Anany (Canadian International College, Egypt), Samir Gaber Sayed Abdel Gawad (Helwan University & University College London (UCL), Egypt) 28

- Performance of Eigenvalue Based Spectrum Sensing In Full-Duplex Cognitive Radio Networks

Ahmed Badawy (Politecnico di Torino, Italy), Tarek M. Elfouly (Qatar University, Qatar), Tamer Khattab (Qatar University, Qatar), Carla-Fabiana Chiasserini (Politecnico di Torino, Italy), Daniele Trinchero (Politecnico di Torino, Italy) 34

- Resource Allocation in Cooperative Cognitive Radio Networks Towards Maritime Cyber Physical Systems

Tingting Yang (Dalian Maritime University, P.R. China), Hailong Feng (Dalian Maritime University, P.R. China), Chengming Yang (Shanghai Jiao Tong University, P.R. China), Zhonghua Sun (Dalian Maritime University, P.R. China), Ruilong Deng (University of Alberta, Canada) 40

Cooperative Networks and Relaying

- Selective Decode-and-Forward Two-Way Relay Network with Weighted Decision-Feedback Differential Coherent Detectors

Junqian Zhang (McGill University, Canada), Harry Leib (McGill University, Canada) 44

- Decision-Based Cooperative Spectrum Sensing Using Random Medium Access

Ahmed M. Ahmed (University of Ottawa, Canada), Ala Abu-Alkheir (University of Ottawa, Canada), Dhaou Said (University of Ottawa & INTERLAB Research Laboratory, Canada), Hussein T. Mouftah (University of Ottawa, Canada) 49

- Transmitter Precoding to Cancel Inter-Relay Interference in AF Systems with Successive Transmissions

Fadhel Alhumaidi (Dalhousie University, Canada), Jacek Ilow (Dalhousie University, Canada) 54

- Adaptive Distributed Compression Technique Utilizing Intermediate Network Nodes

Fuad Shamieh (University of Western Ontario, Canada), Auon Muhammad Akhtar (University of Western Ontario, Canada), Xianbin Wang (University of Western Ontario, Canada) 59

- On the Imperfection of Channel Estimation, Relay's Forwarding Policy and Destination's Knowledge of Signal Presence

Ali Zarei Ghanavati (Simon Fraser University, Canada), Daniel Lee (Simon Fraser University, Canada) 63

Audio, Acoustic, and Speech Signal Processing

- A Robust and Fast Method for Estimating and Tracking the Instantaneous Fundamental Frequency of Audio Signals

Habib Hajimolahoseini (Queen's University, Canada), Saeed Gazor (Queen's University, Canada), Rassoul Amirfattahi (Isfahan University of Technology, Iran) 67

- Efficient Mixed Implementation Method for Audio Source Tracking

Issa Jaafar (Assiniboine College, Canada), Jarvis Tirk (Assiniboine College, Canada) 71

- Nonintrusive Speech Quality Estimation Based on Perceptual Linear Prediction

Vijay Parsa (University of Western Ontario, Canada), Haniyeh Salehi (University of Western Ontario, Canada) 77

- A Glimpse of 3D Acoustics for Immersive Communication

Hanieh Khalilian (Simon Fraser University, Canada), Ivan V. Bajic (Simon Fraser University, Canada), Rodney Vaughan (Simon Fraser University, Canada) 81

- Efficient Audio Segmentation in Soccer Videos

Raghuram M A (National Institute of Technology Karnataka, India), Nikhil Chavan (National Institute of Technology Karnataka, India), Shashidhar G. Koolagudi (National Institute of Technology Karnataka, India), Pravin Ramteke (National Institute of Technology Karnataka, India) 85

Robotics

- Stability Analysis and Trajectory Design of a 2-D.O.F. Bipedal Walker

Mohamed Al-Lawati (Sultan Qaboos University, Oman), Hasan Yousef (Sultan Qaboos University, Oman) 89

- Dynamic Image-based Visual Servoing for Unmanned Aerial Vehicles with Bounded Inputs

Hui Xie (University of Alberta, Canada), Alan Lynch (University of Alberta, Canada) 94

- On ASMC Design for Robotic Manipulators

Jiang Zhu (Royal Military College of Canada, Canada), Karim Khayati (Royal Military College of Canada, Canada) 99

Analog Circuits/Systems

- Ultra-Low Voltage and Low Power Ring Oscillator for Wireless Sensor Network using CMOS Varactor

Zina Saheb (Dalhousie University, Canada), Ezz El-masry (Dalhousie University, Canada), Jean-Francois Bousquet (Dalhousie University, Canada) 103

- A 220nA Bandgap Reference With 80dB PSRR Targeting Energy Harvesting

Ali Tasdighi Far (Independent Researcher, USA) 108

- Energy Harvesting for IoT Sensors Utilizing MEMS Technology

Hejir Rashidzadeh (University of Windsor, Canada), Parvathi Kasargod (University of Windsor, Canada), Tareq Supon (University of Windsor, Canada), Rashid Rashidzadeh (University of Windsor, Canada), Majid Ahmadi (University of Windsor, Canada) 112

- Charge-Based Femto-Farad Capacitance Measurement Technique for MEMS Applications

Adrian Tanskanen (Simon Fraser University, Canada), Behraad Bahreyni (Simon Fraser University, Canada), Marek Syrzycki (Simon Fraser University, Canada) 116

- A 0.4V 90nm CMOS Subthreshold Current Conveyor

Mohammed A. Eldeeb (Misr International University, Egypt), Yehya Ghallab (Helwan University, Egypt), Hassan Elghitani (Misr International University, Egypt), Yehea Ismail (American University in Cairo, USA) 120

Power Systems

- Distributed Generation Long-Term Planning for Voltage Profile Enhancements Using Optimal Hourly Operation Conditions

Hatem Sindi (University of Waterloo & King Abdulaziz University, Canada), Mostafa Shaaban (American University of Sharjah, United Arab Emirates (UAE)), Ehab El-Saadany (Waterloo University, Canada) 124

- Effective Input Features Selection For Electricity Price Forecasting

Abdussalam T. Mohamed (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada) 128

- Fault Detection in Power System Using the Hilbert-Huang Transform

Aashi Manglik (Indian Institute of Technology Kanpur, India), Wei Li (University of Victoria, Canada), Sabbir U. Ahmad (Amec Foster Wheeler, Canada) 133

- Optimal Tuning Of Power System Stabilizers By Biogeography Based Optimization Method

Zakareya Hasan (Dalhousie University, Canada), Kamal Salman (University of Bahrain, Bahrain), Jawad Talaq (University of Bahrain, Bahrain), Mohamed E. El-Hawary (Dalhousie University, Canada) 137

Control Systems

- A Simple Direct Adaptive Inverse Control Structure

Muhammad Shafiq (SQU, Oman), Mohamed Al-Lawati (Sultan Qaboos University, Oman), Hasan Yousef (Sultan Qaboos University, Oman) 143

- Gradient-Based Methods of Tuning Noise Covariance for an Induction Motor Model

Daniel Lee (Simon Fraser University, Canada) 147

- Airspace Configuration Model using Swarm Intelligence based Graph Partitioning

Sheetal Ghorpade (INDIA & RMD Sinhgad College of Engineering, India) 151

Silicon Electronic-Photonic Integrated Circuits

- Materials and device development for silicon photonic detectors

Andrew Knights (McMaster University, Canada) 156

- State-of-the-art Sub-wavelength Grating Couplers for Silicon-on-insulator Platform

Yun Wang (University of British Columbia, Canada), Han Yun (University of British Columbia, Canada), Zeqin Lu (University of British Columbia, Canada), Nick Jaeger (University of British Columbia, Canada), Lukas Chrostowski (University of British Columbia, Canada) 160

- Silicon photonic devices for high-capacity optical interconnects

Wei Shi (COPL, Canada), Raphael Dube Demers (Universite Laval, Canada), Jonathan St-Yves (COPL, Canada), Sophie LaRochelle (Université Laval, Canada) 164

- High Order Modulation Formats for Short Reach Optical Interconnects

Mathieu Chagnon (McGill University, Canada), Mohamed Osman (McGill University & Alexandria University, Canada), David Plant (McGill University, Canada) 168

- Silicon-Photonic Devices: Electronic Control and Stabilization

Mohammed W. AlTaha (University of British Columbia, Canada), Spoorthi Nayak (University of British Columbia, Canada), Hasitha Jayatilleka (University of British Columbia, Canada),

Sudip Shekhar (University of British Columbia, Canada), Shahriar Mirabbasi (University of British Columbia, Canada) 172

Ad hoc Network and WSN

- REEC: Reliable Multicast in Mobile Wireless Ad Hoc Networks

Gholamhossein Ekbatanifard (Ferdowsi University of Mashhad & Islamic Azad University of Lahijan, Iran), Shiva Ramezani Langeroudi (Islamic Azad University, Iran) 176

- Hybrid Wireless Ad Hoc Network Design Based On WIFI Technology For Facing Seismic Catastrophes

Oscar Martinez (National University of Engineering, Nicaragua), Marvin R. Arias (National University of Engineering, Nicaragua), Anayanci López Poveda (National University of Engineering, Nicaragua), Armando Ugarte (National University of Engineering, Nicaragua) 182

- On TDMA Scheduling in Wireless Sensor Networks

Mahesh Bakshi (Concordia University, Canada), Brigitte Jaumard (Concordia University, Canada), Mejdi Kaddour (University of Oran 1, Algeria), Lata Narayanan (Concordia University, Canada) 188

- Bandwidth Aggregation using MPTCP and WMN Gateways

Kelvert Ballantyne (Algonquin College, Canada), Wahab Almuhtadi (Algonquin College, Canada), Jordan Melzer (TELUS Communications, Canada) 194

- Random Node Failures and Wireless Networks Connectivity: a Novel Recovery Scheme

Peng Sun (University of Ottawa, Canada), Nancy Samaan (University of Ottawa, Canada) 200

Cellular Networks/LTE Systems

- Traffic Scenario Recognition and Analysis for Wireless Cellular System: From Social Network Perspective

Zhenglei Yi (Beijing University of Posts and Telecommunications, P.R. China), Yiran Peng (Beijing University of Posts and Telecommunications, P.R. China), Tong Wang (Beijing University of Posts and Telecommunications, P.R. China), Xing Zhang (Beijing University of Posts and Telecommunications, P.R. China), Wenbo Wang (Beijing University of Posts and Telecommunications, P.R. China) 206

- Simulated Annealing based Joint Coverage and Capacity Optimization in LTE

Naveen Mysore Balasubramanya (University of British Columbia, Canada), Lutz Lampe (University of British Columbia, Canada) 211

- Resource Allocation in OFDM Radio Network Adjacent to Satellite System

Guo Cx (Beijing, P.R. China), Liu Zhijian (Beijing, P.R. China), Shen Jiemin (Beijing, P.R. China) 216

- QoE-Aware Downlink User Association in Small Cell Networks via Matching Theory

Hongxiang Shao (PLA University of Science and Technology, P.R. China), Hangsheng Zhao (Nanjing Telecommunication Technology Institute, P.R. China), Long Cao (PLA University of Science and Technology, P.R. China) 220

- Intra-MME/S-GW Handover Performance Analysis in Virtualized 3GPP-LTE Systems

Mohamed Hussein (University of Western, Canada), Serguei Primak (University of Western Ontario, Canada), Abdallah Shami (University of Western Ontario, Canada) 225

Image, Video, and Multidimensional Signal Processing I

- Visual Tracking via Bilateral 2DPCA and Robust Coding

B. K. Shreyamsha Kumar (Concordia University, Canada), M. N. S. Swamy (Concordia University, Canada), M. Omair Ahmad (Concordia University, Canada) 229

- Codebook Design for Vector Quantization using Hexagonal Partitioning

Hiba Shahid (University of British Columbia, Canada), Rabab Ward (University of British Columbia, Canada) 233

- Head pose estimation and its application in TV viewers' behavior analysis

Siyu Wu (Simon Fraser University, Canada), Jie Liang (Simon Fraser University, Canada), Jason Ho (Simon Fraser University, Canada) 239

- A Platform for Subjective Image Quality Evaluation on Mobile Devices

James Lin (Simon Fraser University, Canada), Ivan V. Bajic (Simon Fraser University, Canada) 245

- Multifocus Image fusion via the Hartley transform

Mehdy Dousty (University of Calgary, Canada), Sabalan Daneshvar (University of Tabriz, Iran), Roberto Carlos Sotero Diaz (University of Calgary, Canada) 249

Control and Estimation

- An Object Oriented Framework for a Generic Model Predictive Controller

Timothy Teatro (University of Ontario Institute of Technology, Canada), Mike Eklund (University of Ontario Institute of Technology, Canada) 254

- Computational Procedures for Robust Nonblocking Supervisory Control

Farid Yari (Concordia University, Canada), Shahin Hashtrudi-Zad (Concordia University, Canada) 258

- Designing an Extended Kalman Filter for Estimating Speed and Flux of an Induction Motor with Unknown Noise Covariance

Daniel Lee (Simon Fraser University, Canada) 263

- Cascaded Particle Filter for Real-time Tracking using RGB-D Sensor

Xuhong Liu (Simon Fraser University, Canada), Shahram Payandeh (Simon Fraser University, Canada) 267

- Robust adaptive fault estimation for nonlinear particulate process systems

Gang Li (University of Alberta, Canada), Qing Zhao (University of Alberta, Canada) 273

Digital Circuits/Systems

- A Virtual Memory Architecture to Enhance STT-RAM Performance as Main Memory

Mohammad A. Ewais (American University in Cairo, Egypt), Mohamed Omran (American University in Cairo, Egypt), Andrew Raafat (Information Technology Institute, Egypt), Yousra Alkabani (American University in Cairo, Egypt) 277

- A Novel Gate Grading Approach for Soft Error Tolerance in Combinational Circuits

Mohammad Saeed Ansari (University of Alberta, Canada), Ali Mahani (Shahid Bahonar University, Iran), Jie Han (University of Alberta, Canada), Bruce F. Cockburn (University of Alberta, Canada) 283

- Centralized Parallel Multi-path Multi-Slot Allocation Approach for TDM NoCs

Yong Chen (Dresden University of Technology, Germany), Emil Matus (Dresden University of Technology, Germany), Gerhard P. Fettweis (Dresden University of Technology, Germany) 287

- Design of Digital Modules for Capacitive Proximity Sensing System Applications

Fan Xia (Simon Fraser University, Canada), Behraad Bahreyni (Simon Fraser University, Canada), Fabio Campi (Simon Fraser University, Canada) 292

- A Novel Hybrid CMOS-Memristor Logic Circuit

Mehri Teimoori (Razi University, Iran), Arash Ahmadi (University of Windsor & University of Southampton, Canada), Shahpour Alirezaee (University of Windsor, Canada), Majid Ahmadi (University of Windsor, Canada) 296

General Topics in Power and Energy Systems I

- Designing and Implementing an Educational Intelligent Motor Control Center (IMCC)

Sam Merrick (British Columbia Institute of Technology, Canada), Anthony Paquette (British Columbia Institute of Technology, Canada), Ali Palizban (British Columbia Institute of Technology, Canada), Katherine A Manson (British Columbia Institute of Technology, Canada), Hassan Saberi (British Columbia Institute of Technology, Canada) 300

- Energy Saving Opportunities in a 200MMSFD Sweet Gas Plant

Hooman Mazin (Schneider Electric Canada, Canada), Michael Jackman (Schneider Electric Canada, Canada) 305

- Novel Power Management System For Energy Harvesting in Building Environment

Issa Jaafar (Assiniboine College, Canada), Paul Stack (University College Cork, Ireland) 310

- Control Verification via Off-Line Co-Simulation

Mellitus Ezeme (University of Toronto, Canada), Eman Hammad (University of Toronto, Canada), Deepa Kundur (University of Toronto, Canada) 315

Medical Applications

- Automatic detection of basal cell carcinoma using vascular-extracted features from dermoscopy images

Pegah Kharazmi (University of British Columbia & British Columbia Cancer Research Centre, Canada), Z. Jane Wang (University of British Columbia, Canada), Tim Lee (University of British Columbia, Canada) 319

- Image Processing approach to Generate a Control Signal to Drive an Exoskeleton for Upper Extremity Rehabilitation

Ahmed Elnady (Simon Fraser University, Canada), Sajad Mohamadzadeh (University of Birjand, Iran), Carlo Menon (Simon Fraser University, Canada), Xianta Jiang (Simon Fraser University, Canada) 323

Power Distribution Systems

- Implementation of Load-Curve Smoothing Algorithm Based on Battery Energy Storage System

Manuel Baun (Ryerson University & University of Applied Sciences Osnabrueck, Canada), Mohamed A. Awadallah (Ryerson University, Canada), Bala Venkatesh (Ryerson University, Canada) 327

- Evaluation of Energetic Efficiency of the Industrial Systems by using Benchmark Energy Factor

Constantin Pitis (Powertech Labs Inc., Canada), Zaid Al-Chalabi (ASA Energy Consulting Ltd., Canada) 332

- Simulation-based investigation of optimal demand-side primary frequency regulation

Atieh Delavari (Laval University, Canada), Innocent Kamwa (Hydro-Québec/IREQ, Canada) 337

- Implementing Self-Healing Distribution Systems via Fault Location, Isolation and Service Restoration

Richard Guo (Powertech Labs Inc., Canada), Chris Qu (Powertech Labs Inc., Canada), Vidya Vankayala (Powertech Labs Inc., Canada), Eugene Crozier (Powertech Labs Inc., Canada), Stephen Allen (Powertech Labs Inc., Canada), Kunle Adeleye (BC Hydro, Canada) 343

- Voltage Management Challenges in Feeders with High Penetration of Distributed Generation

Hamed Ahmadi (BC Hydro & University of British Columbia, Canada), Aaron Ellis (BC Hydro, Canada), Jose R. Marti (University of British Columbia, Canada) 347

Security and Privacy

- RPsec: Managing Routing Protocol Security

Nitin Prajapati (Concordia University, Canada), J. William Atwood (Concordia University, Canada) 353

- An Architecture for a Secured Tunnel in the Automatic Multicast Tunneling (AMT) Environment

Abonti Ferdous (Concordia University, Canada), J. William Atwood (Concordia University, Canada) 359

- Using Resource Public Key Infrastructure for Secure Border Gateway Protocol

George Chang (Simon Fraser University, Canada), Majid Arianezhad (Simon Fraser University, Canada), Ljiljana Trajković (Simon Fraser University, Canada) 365

- Secure Robust Collaborative Spectrum Sensing in the Presence of Smart Attackers

Zahra Pourgharehkhani (Imam Khomeini International University, Iran), Abbas Taherpour (Imam Khomeini International University, Iran), Tamer Khattab (Qatar University, Qatar) 371

- Machine Learning Techniques for Intrusion Detection on Public Dataset

Udaya Sampath K. Perera Miriya Thantrige (University of Western Ontario, Canada), Jagath Samarabandu (University of Western Ontario, Canada), Xianbin Wang (University of Western Ontario, Canada) 377

IOT

- Modeling and Delay Analysis of Wireless HANs in Smart Grids over Fading Channels Subjected to Multiple Access Schemes and Interference

Abdulfattah Noorwali (University of Western Ontario, Canada), Abdulbaset Mustafa Hamed (University of Western Ontario, Canada), Raveendra Kolarramakrishna Rao (University of Western Ontario, Canada), Abdallah Shami (University of Western Ontario, Canada) 381

- Increased Throughput and Reduced Delay with Partially Overlapping Channel in WMNs

Brigitte Jaumard (Concordia University, Canada), Mahdi Negahishirazi (Concordia University, Canada), Mejdi Kaddour (University of Oran 1, Algeria) 387

- End-to-End Delay Analysis of Wireless Mesh Backbone Network in a Smart Grid

Abdulfattah Noorwali (University of Western Ontario, Canada), Raveendra Kolarramakrishna Rao (University of Western Ontario, Canada), Abdallah Shami (University of Western Ontario, Canada) 393

- Cooperative Spectrum Sensing for Cognitive Radio Vehicular Ad Hoc Networks: An Overview and Open Research Issues

Ahmed M. Ahmed (University of Ottawa, Canada), Ala Abu-Alkheir (University of Ottawa, Canada), Dhaou Said (University of Ottawa & INTERLAB Research Laboratory, Canada), Hussein T. Mouftah (University of Ottawa, Canada) 399

Signal Processing Theory and Methods

- Frequency Domain Analysis for Statistical Assessment of Wind Resources

Maxwell Little (Memorial University of Newfoundland, Canada), Kevin Pope (Memorial University of Newfoundland, Canada) 403

- Underdetermined Joint Blind Source Separation based on Tensor Decomposition

Liang Zou (University of British Columbia, Canada), Xun Chen (Hefei University of Technology, P.R. China), Z. Jane Wang (University of British Columbia, Canada), Xiangyang Ji (Tsinghua University, P.R. China) 408

- A new Margin-based AdaBoost Algorithm: Even more robust than RobustBoost to class-label noise

Omid Ranjbar Pouya (University of Manitoba, Canada) 412

- Beating the Zero-Sum Game Using GA to Optimize Technical Financial Market Indicators

Kaamran Raahemifar (Ryerson University, Canada) 417

- Active Noise Cancellation: Where Does the Extra Power Go?

Ying Chen (Simon Fraser University, Canada), Rodney Vaughan (Simon Fraser University, Canada) 423

Control Applications

- Position Control of an Offshore Wind Turbine with a Semi-submersible Floating Platform Using the Aerodynamic Force

Chenlu Han (University of British Columbia, Canada), Ryoza Nagamune (University of British Columbia, Canada) 427

- Ultrasonic Inspection of Underwater Guy Wires with Applications to Floating Oil Platforms

Bhoomibahen Patel (University of Regina, Canada), Raman Paranjape (University of Regina, Canada), Mehran Mehrandezh (University of Regina, Canada), Lei Zhang (University of Regina, Canada) 431

- Floating-Body Motion Control by Coupling an Oscillating Mass for Wind Turbine Applications

Anderson Ricardo Webler Soares Cabral (University of British Columbia, Canada), Ryoza Nagamune (University of British Columbia, Canada) 435

- Classification of Same Arm Movements Using Different Kernels Learning Support Vector Machine

Mojgan Tavakolan (Simon Fraser University, Canada), Carlo Menon (Simon Fraser University, Canada) 439

- Double Internal Model Control for Permanent Magnet Synchronous Motor Vector Control System

Haowen Li (Xi'an University of Technology, P.R. China), Zhao Meng (Xi'an University of Technology, P.R. China), Gang Zheng (Xi'an University of Technology, P.R. China), Haijing Wu (Xi'an University of Technology, P.R. China) 443

Drivers and Power Amplifiers

- A High-Voltage Driver Based on Stacked Low-Voltage Transistors with Minimized On-Resistance for a Buck Converter in 65 nm CMOS

Sara Pashmineh (Brandenburg University of Technology, Germany), Dirk Killat (Brandenburg University of Technology, Germany) 447

- Design of a High-Voltage Rail-to-Rail Error Amplifier based on Standard CMOS used in an LDO

Sara Pashmineh (Brandenburg University of Technology, Germany), Stefan Bramburger (Brandenburg University of Technology, Germany), Dirk Killat (Brandenburg University of Technology, Germany) 452

- Low Current, 100MHz Bandwidth Envelope Detector for CMOS RFIC PAs

David Berthiaume (École de Technologie Supérieure, Canada), Smarjeet Sharma (École de Technologie Supérieure, Canada), Nicolas Constantin (Ecole de Technologie Supérieure & Université du Québec, Canada) 457

- On the use of conical helix inductors in wireless power transfer systems

Parinaz Hadadtehrani (University of British Columbia, Canada), Pouya Kamalinejad (University of British Columbia, Canada), Reza Molavi (University of British Columbia, Canada), Shahriar Mirabbasi (University of British Columbia, Canada) 461

- On Moderate Inversion/Saturation Regions As Approximations to "Reconciliation" Model

Igor Filanovsky (University of Alberta, Canada), Jani Jarvenhaara (Tampere University of Technology, Finland), Nikolay Tchamov (Tampere University of Technology, Finland) 465

General Topics in Power and Energy Systems II

- A Review on the Proposed Solutions to Microgrid Protection Problems

Nancy Mohamed (University of Waterloo, Canada), Magdy Salama (University of Waterloo, Canada) 470

- A Survey on Recent Energy Harvesting Mechanisms

Abdul-Rahman El-Sayed (University of Guelph, Canada), Kevin Tai (University of Guelph, Canada), Mohammad Biglarbegian (University of Guelph, Canada), Shohel Mahmud (University of Guelph, Canada) 475

- PV Harmonic Distribution Analysis for Various Conditions

Shadi Shehadeh (Dalhousie University, Canada), Hamed Aly (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada) 480

- Application of Dynamic Voltage Restorer for Power Quality Improvement in Induction Furnace

Tejinder Singh Saggu (PEC University of Technology, India), Lakhwinder Singh (Baba Banda Singh Bahadur Engineering College, India) 486

- Performance Analysis of Boost Converter by Using Different Integration Algorithms

Haytham Abdel-Gawad (University of Ontario Institute of Technology, Canada), Vijay K. Sood (University of Ontario Institute of Technology, Canada) 490

Image, Video, and Multidimensional Signal Processing II

- An Efficient No-Reference Blurriness Metric for Images and Video frames

Muhammad Uzair (University of Guelph, Canada), Robert D. Dony (University of Guelph, Canada) 495

- RDO Cost Modeling for Low-Complexity HEVC Intra Coding

Mohammadreza Jamali (École de Technologie Supérieure, Canada), Stéphane Coulombe (École de Technologie Supérieure, Canada) 499

- SAR Image Despeckling Using Vector-Based Hidden Markov Model in Wavelet Domain

Marzieh Amini (Concordia University, Canada), M. Omair Ahmad (Concordia University, Canada), M. N. S. Swamy (Concordia University, Canada) 504

- A Simulation Environment for Visual-Inertial Sensor Fusion

Mehdi Stapleton (Simon Fraser University, Canada), Md. Zulfiquar Ali Bhotto (Simon Fraser University, Canada), Ivan V. Bajic (Simon Fraser University, Canada) 508

- Automatic Cleavage Detection in H.264 Sequence of Human Embryo Development

Reza Moradi Rad (Simon Fraser University, Canada), Parvaneh Saeedi (Simon Fraser University, Canada), Ivan V. Bajic (Simon Fraser University, Canada) 514

- Image Reconstruction from Discrete Orthogonal Racah Moments

Yexiao Wu (University of Winnipeg, Canada), Simon X. Liao (University of Winnipeg, Canada) 518

- Color Image Denoising using Multivariate Cauchy PDF in the Contourlet Domain

Hamidreza Sadreazami (Concordia University, Canada), M. Omair Ahmad (Concordia University, Canada), M. N. S. Swamy (Concordia University, Canada) 523

Secure and Efficient ICT Infrastructures

- Energy-efficient and Distributed Data-aware Clustering Protocol for the Internet-of-Things

Chinmaya Mahapatra (University of British Columbia, Canada), Zhengguo Sheng (University of Sussex, United Kingdom), Victor C.M. Leung (University of British Columbia, Canada) 527

- Adaptive Granular HARQ LDPC-Based Coding for Secrecy Enhancement in Wiretap Channels

Ahmadreza Amirzadeh (Laval University, Canada), Mohamed Haj Taieb (Laval University, Canada), Jean-Yves Chouinard (Laval University, Canada) 532

- Analyzing Surveillance Videos using automatically generated processing sequences with Knowledge-Augmented Genetic Algorithms

Jagath Samarabandu (University of Western Ontario, Canada), Kamal Ranaweera (University of Alberta, Canada) 537

- Virtualized Allocation Performance Analysis in 5G Two-Tier Cellular Networks

Mohamed Hussein (University of Western, Canada), Abdallah Moubayed (University of Western Ontario, Canada), Serguei Primak (University of Western Ontario, Canada), Abdallah Shami (University of Western Ontario, Canada) 542

- Detection of GPS Spoofing through Signal Multipath Signature Analysis

Hao Li (University of Western Ontario, Canada), Xianbin Wang (University of Western Ontario, Canada) 546

Optical Network and Light Communication

- On Determining the Cost-Effective Optical Transport Network Architecture for Next Generation Data Center Interconnectivity

Nabil A. Naas (University of Ottawa & University of Tripoli, Canada), Hussein T. Mouftah (University of Ottawa, Canada) 551

- Attack-Aware RWA Using Knowledge of Demand Holding Times

Hongbo Zhao (University of Windsor, Canada), Saja Al Mamoori (University of Windsor, Canada), Arunita Jaekel (University of Windsor, Canada) 557

- Resource Requirements in Fixed-Grid and Flex-Grid Networks for Dynamic Provisioning of Data Center Traffic

Michał Aibin (Wroclaw University Of Technology & Simon Fraser University, Poland), Krzysztof Walkowiak (Wroclaw University of Science and Technology, Poland) 561

- Shadowing Effects on Visible Light Communication Channels

Hasan Farahneh (Ryerson University, Canada), Ala Khalifeh (German University of Jordan, Jordan), Christopher Mekhiel (Ryerson University, Canada), Wisam Farjow (Ryerson University & The PBE Group, Canada), Xavier N. Fernando (Ryerson University, Canada) 565

- Theoretical Accuracy Analysis of Indoor Visible Light Communication Positioning System Based on Time-of-Arrival

Changeez Amini (Qazvin, Iran), Abbas Taherpour (Imam Khomeini International University, Iran), Tamer Khattab (Qatar University, Qatar), Saeed Gazor (Queen's University, Canada) 570

Applications I

- Using Density Peaks Sentence Clustering For Update Summary Generation

Wu Guohua (HangZhou DianZi University, P.R. China), Guo Yutian (HangZhou DianZi University, P.R. China) 575

- A System for Vehicle Collision and Rollover Detection

Hamdy A. Ibrahim (University of Calgary, Canada), Behrouz Far (University of Calgary, Canada), Ahmed Aly (Graduate, Canada) 580

- Parallel Implementation of Image Matching with MPI

Alejandro Alfonso (Ryerson University, Canada), Ismail Sheikh (Ryerson University, Canada), Nagi Mekhiel (Ryerson University, Canada) 586

- Computer Vision Based Detection and Localization of Potholes in Asphalt Pavement Images

Kanza Azhar (University of Engineering and Technology Taxila, Pakistan), Fiza Murtaza (University of Engineering and Technology Taxila, Pakistan), Muhammad Haroon Yousaf (University of Engineering and Technology Taxila, Pakistan), Hafiz Adnan Habib (University of Engineering and Technology Taxila, Pakistan) 590

Information Forensics and Security

- Estimating the Steganographic Capacity of Band-Limited Channels

Brent Carrara (University of Ottawa, Canada), Carlisle Adams (University of Ottawa, Canada) 595

- Computer Recognition Based On the Compromising Emanations Fingerprint

Jun Shi (Chinese Academy of Sciences, P.R. China), Degang Sun (Chinese Academy of Sciences, P.R. China), Abbas Yongacoglu (University of Ottawa, Canada), Meng Zhang (Chinese Academy of Sciences, P.R. China), Dong Wei (Chinese Academy of Sciences & Institute of Information Engineering, P.R. China) 600

- Enhanced Binary Patterns for Electrocardiogram (ECG) Biometrics

Wael Louis (University of Toronto, Canada), Dimitrois Hatzinakos (University of Toronto, Canada) 606

- On Evaluating Human Recognition using Electrocardiogram Signals: From Rest to Exercise

Majid Komeili (University of Toronto, Canada), Wael Louis (University of Toronto, Canada), Narges Armanfard (McMaster University, Canada), Dimitrois Hatzinakos (University of Toronto, Canada) 610

- A Robust Quantization-based Image Watermarking Scheme in the Wavelet-based Contourlet Domain

Hamidreza Sadreazami (Concordia University, Canada), M. Omair Ahmad (Concordia University, Canada), M. N. S. Swamy (Concordia University, Canada) 614

Signal Processing for Communications and Networking

- Modulation Assisted Preprocessing for Non-binary LDPC Decoding with Extended Min-Sum Algorithm

Tianqing Wu (University of Victoria, Canada), Hong-Chuan Yang (University of Victoria, Canada), Jingwen Yan (Shantou University, P.R. China) 618

- Optimal Power Allocation for Massive MU-MIMO Downlink TDD Systems

Omid Saatlou (Concordia University, Canada), M. Omair Ahmad (Concordia University, Canada), M. N. S. Swamy (Concordia University, Canada) 622

- Aspects of Antenna Pattern Estimation from Planar Near-Fields

Maryam Razmhosseini (Simon Fraser University, Canada), Rodney Vaughan (Simon Fraser University, Canada) 626

- Diffraction: A Critical Propagation Mechanism

Roshanak Zabihi (Simon Fraser University, Canada), Rodney Vaughan (Simon Fraser University, Canada) 631

- Practical Accuracy of Directivity, Efficiency and Gain from the Spherical Near Field

Roshanak Zabihi (Simon Fraser University, Canada), Rodney Vaughan (Simon Fraser University, Canada) 635

Micro and Nano Grids

- Novel Method for Power Flow Optimization in Commercial Buildings

Richard Guo (Powertech Labs Inc., Canada), Chris Qu (Powertech Labs Inc., Canada), Constantin Pitis (Powertech Labs Inc., Canada), Vidya Vankayala (Powertech Labs Inc., Canada), Tina Liu (BC Hydro, Canada), Guanchen Zhang (Powertech Labs Inc., Canada) 640

- Design and Implementation of a Highly Reconfigurable Microgrid Test Bed Platform

Marten Pape (University of Waterloo, Canada), Mahmoud Allam (University of Waterloo, Canada), Mehrdad Kazerani (University of Waterloo, Canada) 644

- Control of the Power Electronics Interface of a PV Source in a Smart Residential DC Nanogrid

Ahmad Malkawi (Concordia University, Canada), Luiz A. C. Lopes (Concordia University, Canada) 650

- Analysis of a Micro-Grid Behavior by a Supervisory Control And Data Acquisition System-Experimental Validation

Hussein Ibrahim (Wind Energy TechnoCentre, Canada), Raied Debibi (Université du Québec à Rimouski, Canada), Karim Belmokhtar (Wind Energy TechnoCentre, Canada), Anis Ben Arfi (University of Calgary, Schulich School of Engineering, Canada) 654

- Inexact Power Sharing in AC/DC Hybrid Microgrids

Abdelsalam Eajal (University of Waterloo, Canada), Ehab El-Saadany (Waterloo University, Canada), Kumaraswamy Ponnambalam (University of Waterloo, Canada) 660

BGP and Internet

- Route Flap Damping Mechanism Modification to Improve BGP Convergence

Eatedal Alabdulkreem (Brunel University, United Kingdom), Hamed Saffa Al-Raweshidy (University of Brunel, United Kingdom) 665

- Classifying Anomalous Events in BGP Datasets

Marijana Cosovic (University of East Sarajevo, Bosnia and Herzegovina), Slobodan Obradovic (University of East Sarajevo, Bosnia and Herzegovina), Ljiljana Trajković (Simon Fraser University, Canada) 669

- Security Analysis of C-BGP: A Light Alternative to S-BGP

Junaid Israr (University of Ottawa, Canada), Youssef Gahi (University of Ottawa, Canada), Mouhcine Guennoun (University of Ottawa, Canada), Hussein T. Mouftah (University of Ottawa, Canada) 673

- Privacy Risk Assessment for Web Tracking

Asma Hamed (National School of Computer Science/ Esprit School of Engineering, Tunisia), Hella Kaffel-Ben Ayed (University of Tunis El Manar & University of Manouba, Tunisia) 679

Devices, Models, and Methods

- Read Disturbance and Temperature Variation Aware Spintronic Memristor Model

Sherief Fathi Nafea (Suez Canal University, Egypt), Ahmed Ahmed Shaaban Dessouki (Port Said University, Egypt), Sayed El-Rabie (Dep. of Electronic and Communication Eng., Egypt), Khairy El_barbary (Military Technical College, Egypt), Hassan Mostafa (University of Toronto, Canada) 685

- A Cellular Automata Based Izhikevich Neuron Model

Farnaz Khani (Razi University, Iran), Arash Ahmadi (University of Windsor & University of Southampton, Canada), Shahpour Alirezaee (University of Windsor, Canada), Majid Ahmadi (University of Windsor, Canada) 689

- The use of embedded DAS for electronic signal measurements

Nkateko Mabunda (University of Johannesburg, South Africa), Meera Joseph (University of Johannesburg, South Africa) 693

- Wearable system-on-module for prosopagnosia rehabilitation

Kok Yee Lu (University of Calgary, Canada), Svetlana N. Yanushkevich (University of Calgary, Canada) 698

- Orbital Angular Momentum (OAM) Modes for 2-D Beam-Steering of Circular Arrays

Marek Klemes (Huawei Technologies Co. Ltd., Canada), Halim Boutayeb (Huawei Technologies Co. Ltd., Canada), Fayez Hyjazie (Huawei Technologies Co. Ltd., Canada) 702

Automated, Connected, and Electric Vehicles

- The AURORA Connected Vehicle Technology Testbed

David G. Michelson (University of British Columbia, Canada), Victor C.M. Leung (University of British Columbia, Canada), Garland Chow (University of British Columbia, Canada) 707

- Addressing Key Challenges in Transportation Mode Electrification

Curran Crawford (University of Victoria, Canada), Anaissia Franca (University of Victoria, Canada), John Jancowski-Walsh (University of Victoria, Canada), Daniel Clancy (University of Victoria, Canada), Alyona Ivanova (University of Victoria, Canada), Nima Harsamizadeh Tehrani (University of Victoria, Canada), Pouya Amid (University of Victoria, Canada), Sahand Behboodi (University of Victoria & IESVic, Canada), David P. Chassin (Pacific Northwest National Laboratory & Battelle Memorial Institute, USA), Ned Djlali (University of Victoria, Canada) 711

- Baseline Load Forecasting Using a Bayesian Approach

Nima Harsamizadeh Tehrani (University of Victoria, Canada), Usman Khan (University of Victoria, Canada), Curran Crawford (University of Victoria, Canada) 715

- INS/GPS Localization for Reliable Cooperative Driving

Samira Kaviani (University of British Columbia, Canada), Marie O'Brien (University of British Columbia, Canada), Jessica Van Brummelen (University of British Columbia, Canada), Homayoun Najjaran (University of British Columbia, Canada), David G. Michelson (University of British Columbia, Canada) 719

MIMO

- Practical Hybrid Precoding for Multi-user Massive MIMO Systems

Muhammad Hanif (University of Victoria, Canada), Hong-Chuan Yang (University of Victoria, Canada), Gary Boudreau (Ericsson, Canada), Edward Sich (Ericsson Canada Inc., Canada), S. Hossein Seyedmehdi (Ericsson, Canada) 723

- On the degrees of freedom region of the $M \times N$ Interference Channel

Mohamed Amir Khalil (Qatar University, Qatar), Amr El-Keyi (Carleton University, Canada), Tamer Khattab (Qatar University, Qatar), Mohammed Nafie (Cairo University & Nile University, Egypt) 727

- Beamforming for MIMO Cognitive Radio with Single Primary and Multiple Secondary Users

Milad Amir Toutounchian (Simon Fraser University, Canada), Rodney Vaughan (Simon Fraser University, Canada) 733

- N-Process Stop and Wait for MIMO Systems with Transmit Antenna Assignment

Elizabeth Okumu (University of Cape Town, South Africa), Mqhele E. Dlodlo (University of Cape Town, South Africa) 738

- Design of Simple Array Antennas for High Directivity

Abhijit Bhattacharya (Simon Fraser University, Canada), Rodney Vaughan (Simon Fraser University, Canada) 743

Memory

- A Profiling Tool for Exploiting use of Packed Objects in Java Programs

Umang Pandya (University of New Brunswick, Canada), Kenneth B. Kent (University of New Brunswick, Canada), Eric Aubanel (University of New Brunswick, Canada), Karl Taylor (IBM Canada, Canada) 747

- Object Layout Optimization in the JVM Based on Affinity

Taees Eimouri (University of New Brunswick, Canada), Kenneth B. Kent (University of New Brunswick, Canada), Aleksandar Micic (IBM Canada, Canada), Karl Taylor (IBM Canada, Canada) 753

- Write Improvement Strategies for Serial NOR Dataflash Memory

Scott Fazackerley (University of British Columbia, Canada), Wade Penson (University of British Columbia, Canada), Ramon Lawrence (University of British Columbia Okanagan, Canada) 758

- Effects of False Sharing and Locality on Object Layout Optimization for Multi-Threaded Applications

Taees Eimouri (University of New Brunswick, Canada), Kenneth B. Kent (University of New Brunswick, Canada), Aleksandar Micic (IBM Canada, Canada) 764

- Thread-Group Based Local Heap Garbage Collection in a Simulated Runtime Environment

Marcel Dombrowski (University of New Brunswick, Canada), Konstantin Nasartschuk (University of New Brunswick, Canada), Kenneth B. Kent (University of New Brunswick, Canada), Gerhard W. Dueck (University of New Brunswick, Canada), Charlie Gracie (IBM Canada, Canada) 769

Classification and Modeling I

- Classification of Electromagnetic signals obtained from microwave scattering over healthy and tumorous breast models

Jorge Sacristán (University of Manitoba, Canada), Bárbara L. Oliveira (National University of Ireland, Galway, Ireland), Stephen Pistorius (University of Manitoba & CancerCare Manitoba, Canada) 775

- The application of Supervised Learning through Feed-forward Neural Networks for ECG signal classification

Robnier Reyes Perez (Ryerson University, Canada), Andrew Marques (Ryerson University, Canada), Farah Mohammadi (Ryerson University, Canada) 780

- Human Blastocyst Segmentation using Neural Network

Shakiba Kheradmand (Simon Fraser University, Canada), Parvaneh Saeedi (Simon Fraser University, Canada), Ivan V. Bajic (Simon Fraser University, Canada) 784

- Modified Maximum Time Difference Intracardiac Conduction Velocity Estimation

Mohammad Hassan Shariat (Queen's University, Canada), Saeed Gazor (Queen's University, Canada), Damian Redfearn (Queen's University, Canada) 788

Energy Forecasting and Optimization

- Mid-Term Electricity Price Forecasting Using SVM

Abdussalam T. Mohamed (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada) 792

- Optimization of domestic energy consumption

Ramyar Rashed Mohassel (Ryerson University, Canada), Kaamran Raahemifar (Ryerson University, Canada) 798

- Economic Dispatch Incorporating Wind Energy by BH, BBO and DE

Zakareya Hasan (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada) 804

- A Novel Approach in Household Electricity Consumption Forecasting

Assad Sahebalam (Ryerson University, Canada), Wael Khreich (École de Technologie Supérieure, Canada), Soosan Beheshti (Ryerson University, Canada), Edward Wyndel Nidoy (Ryerson University, Canada) 810

- Multi-Area Security-Constrained Unit Commitment and Reserve Allocation with Wind Generators

Jules Bonaventure Mogo, Jb (Laval University, Canada), Innocent Kamwa (Hydro-Québec/IREQ, Canada), Jerome Cros (Laval University, Canada) 814

Advances in Power Systems Tools

- Linear Quadratic Regulator design for Power System Stabilizer using Biogeography Based Optimization Method

Zakareya Hasan (Dalhousie University, Canada), Kamal Salman (University of Bahrain, Bahrain), Mohamed E. El-Hawary (Dalhousie University, Canada) 820

- Instability Incident During Remote Independent Power Producer Commissioning in BC Hydro System and Corrective Actions to Enhance System Stability

Hamid Atighechi (BC Hydro, Canada), Guihua Wang (BC Hydro, Canada), Seyyedmilad Ebrahimi (University of British Columbia, Canada) 826

- A novel approach for instability detection based on wide-area measurements and new predictors

Hussein Suprême (Ecole de Technologie Superieure, Canada), Annissa Heniche-Oussédik (Hydro-Québec/IREQ, Canada), Innocent Kamwa (Hydro-Québec/IREQ, Canada), Louis-A. Dessaint (Ecole de Technologie Superieure, Canada) 830

- Independent Component Analysis for Feature Reduction in Critical Clearing Time Estimation

Robert T. F. Ah King (University of Mauritius, Mauritius), Xiaoping Tu (École de Technologie Supérieure, Canada), Louis-A. Dessaint (Ecole de Technologie Superieure, Canada) 836

- Multi-Contingency Transient Stability-Constrained Optimal Power Flow using Multilayer Feedforward Neural Networks

Robert T. F. Ah King (University of Mauritius, Mauritius), Xiaoping Tu (École de Technologie Supérieure, Canada), Louis-A. Dessaint (Ecole de Technologie Superieure, Canada), Innocent Kamwa (Hydro-Québec/IREQ, Canada) 841

Modulation and Coding

- CF Technique with CPM Mappers in OFDM Systems for Reduction of PAPR

Emammer Shafter (University of Western Ontario, Canada), Raveendra Kolarramakrishna Rao (University of Western Ontario, Canada) 847

- Multi-Subcarrier OVSA Code Allocation in WCDMA

Noha Elmosilhy (Canadian International College, Egypt), Mohamed El-Mahallawy (Arab Academy for Science and Technology and Maritime Transport, Egypt), Mohamed Khedr (Virginia Tech, USA) 852

- Multi-Mode Multi-Level Continuous Phase Chirp Modulation: Coherent Detection

Mohammad Alsharef (University of Western Ontario, Canada), Raveendra Kolarramakrishna Rao (University of Western Ontario, Canada) 857

- Energy Efficient Adaptive Transmission in Generalized-K Fading Channel

Abdulbaset Mustafa Hamed (University of Western Ontario, Canada), Abdulfattah Noorwali (University of Western Ontario, Canada), Raveendra Kolarramakrishna Rao (University of Western Ontario, Canada) 862

Signal Processing Theory, Methods, and Applications

- Reconstruction-Error Distortion in LTI system modeling

Assad Sahebalam (Ryerson University, Canada), Soosan Beheshti (Ryerson University, Canada) 867

- Perceptually Motivated Binaural Beamforming with Cues Preservation for Hearing Aids

Hala As'ad (University of Ottawa, Canada), Martin Bouchard (University of Ottawa, Canada), Homayoun Kamkar Parsi (Sivantos Group, Germany) 871

- User-induced Antenna Variation and its Impact on the Performance of RSS-Based Indoor Positioning

Navid Amani (University of Calgary, Canada), Vahid Dehghanian (University of Calgary, Canada), John Nielsen (University of Calgary, Canada) 876

- False Discovery Rate Controller for Functional Brain Parcellation

Adrian Wong (University of British Columbia, Canada), Martin McKeown (University of British Columbia, Canada), Mehdi Moradi (University of British Columbia, Canada), Z. Jane Wang (University of British Columbia, Canada) 881

- Machine Learning for Quality Prediction in Abrasion- Resistant Material Manufacturing Process

Z. Jane Wang (University of British Columbia, Canada), Parsa Mohammadi (University of British Columbia, Canada) 885

Online Monitoring

- Peak Electricity Load Forecasting Using Online Support Vector Regression

Jagjeet Dhillon (University of British Columbia, Canada), Shah Atiqur Rahman (University of British Columbia, Canada), Sabbir U. Ahmad (Amec Foster Wheeler, Canada), Md. Jahangir Hossain (University of British Columbia, Okanagan, Canada) 889

- Wavelet Based Real-Time Power Quality Monitoring

Sameer Singh (OPAL-RT Technologies Pvt. Ltd., India), Bhavna Jain (SISTec-E, India), Shailendra Jain (Maulana Azad Institute of Science and Technology Bhopal, India) 893

- Non-intrusive Load Monitoring Using Orthogonal Wavelet Analysis

Jessie Gillis (University of Ontario Institute of Technology, Canada), Walid Morsi (University of Ontario Institute of Technology, Canada) 899

- Investigating the Switch Continuity Principle Assumed in Non-Intrusive Load Monitoring (NILM)

Stephen Makonin (Simon Fraser University, Canada) 904

- Power System Tracking State Estimation Based on Stochastic Fractal Search Technique under Sudden Load Changing Conditions

Hossam Mosbah (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada) 908

Modeling and Algorithms

- Solving Very Large RWA Data Instances

Brigitte Jaumard (Concordia University, Canada), Maryam Daryalal (Concordia University, Canada) 914

- A Dynamic Programming Offloading Algorithm for Mobile Cloud Computing

Haleh Shahzad (McMaster University, Canada), Ted Szymanski (McMaster University, Canada) 920

- Real-time parallel routing for telecom networks, Graph algorithms and bulk-synchronous parallel acceleration

Gaétan J. D. R. Hains (Huawei Technologies Co. Ltd., France), Alain Dominguez (Huawei Technologies Co. Ltd., France) 925

- An AQM based Congestion Control for eNB RLC in 4G/LTE Network

Anup Kumar Paul (KDDI R&D Laboratories Inc., Japan), Hidehiko Kawakami (KDDI R&D Laboratories Inc., Japan), Atsuo Tachibana (KDDI R&D Laboratories Inc., Japan), Teruyuki Hasegawa (KDDI R&D Laboratories Inc., Japan) 929

- Link Duration Estimation using Neural Networks based Mobility Prediction in Vehicular Networks

Nizar Alsharif (University of Waterloo, Canada), Khalid Aldubaikhy (University of Waterloo, Canada), Sherman Shen (University of Waterloo, Canada) 934

Design

- Wireless Sensor Networks with Pressure-Based Energy Forecasting: A Simulation Study

James Rodway (University of Alberta, Canada), Petr Musilek (University of Alberta, Canada) 938

- Blind Forwarding for Secure and Private Communications in Untrusted Networks

Yacine Ichibane (Ecole Mohammadia d'Ingenieurs, Morocco), Youssef Gahi (University of Ottawa, Canada), Mouhcine Guennoun (University of Ottawa, Canada), Zouhair Guennoun (Ecole Mohammadia d'Ingenieurs & Laboratoire d'Electronique et de Communications, Morocco) 942

- Retargeting and Enhancing a Compact Multitasking Kernel for the Altera Nios II Processor

Naraig Manjikian (Queen's University, Canada) 946

- Dynamic Peer-assisted DASH Framework using Dynamic Updates and Prioritization Scheme

Mohamed Mohamed Rehan (AvidBeam Technologies, Egypt), Rana Morsi (AvidBeam Technologies, Egypt) 951

- Design and Implementation of BPSK MODEM for IEEE 802.15.4/ZigBee Devices

Haytham Elmiligi (Thompson Rivers University, Canada), Mohamed Watheq El-Kharashi (Ain Shams University, Egypt), Fayez Gebali (University of Victoria, Canada) 957

Classification and Modeling II

- Comparison of a new ad-hoc classification method with Support Vector Machine and Ensemble classifiers for the diagnosis of Meniere's disease using EVestG signals

Zeinab Dastgheib (University of Manitoba, Canada), Omid Ranjbar Pouya (University of Manitoba, Canada), Brian Lithgow (Riverview Health Center, Canada), Zahra Moussavi (University of Manitoba, Canada) 962

- Feasibility of Support Vector Machine Gesture Classification on a Wearable Embedded Device

Dong Yang (Simon Fraser University, Canada), Neha Chhatre (Simon Fraser University, Canada), Fabio Campi (Simon Fraser University, Canada), Carlo Menon (Simon Fraser University, Canada) 966

- Bayesian Optimization of BCI parameters

Hossein Bashashati (University of British Columbia, Canada), Rabab Ward (University of British Columbia, Canada), Ali Bashashati (Centre for Translational and Applied Genomics, British Columbia Cancer Agency, Canada) 970

- Mutual information based detection of thermal profile in hand joints of rheumatoid arthritis patients using non-parametric windows

Ali Nouri (Isfahan University of Technology, Iran), Rassoul Amirfattahi (Isfahan University of Technology, Iran), Hamidreza Moussavi (Isfahan University of Medical Sciences, Iran) 975

Renewable Energy Systems

- Optimal Sizing of Wind/Solar Mix for Supply Security of Active Power Distribution Systems

Mohammed Nassar (University of Waterloo, Canada), Magdy Salama (University of Waterloo, Canada) 979

- Energy Management Strategy of On-grid/Off-grid Wind Energy Battery-Storage System

Boubacar Housseini (Royal Military College of Canada, Canada), Francis Aime Okou (Royal Military College of Canada, Canada), Rachid Beguenane (Royal Military College of Canada, Canada) 983

- Efficient Simulation of Wind Farms Using Switching Reduced Models of Converters and VBR Formulation of Six-Phase PM Synchronous Generators

Seyyedmilad Ebrahimi (University of British Columbia, Canada), Navid Amiri (University of British Columbia, Canada), Yingwei Huang (University of British Columbia, Canada), Liwei Wang (University of British Columbia, Canada), Juri Jatskevich (University of British Columbia, Canada) 989

- Enhancing the Performance of Controlled Distributed Energy Resources in Noisy Communication Environments

Abdallah Farraj (University of Toronto, Canada), Eman Hammad (University of Toronto, Canada), Deepa Kundur (University of Toronto, Canada) 993

Transmission and Distribution

- Transmission line length, operating condition and rating regime

Leanne Dawson (University of Calgary, Canada), Andy Knight (University of Calgary, Canada) 997

- Transmission Line Impedance Calculation Using Detailed Line Geometry and HEM Soil Resistivity Measurements

Hamed Ahmadi (BC Hydro & University of British Columbia, Canada), Mazana Armstrong (BC Hydro, Canada) 1003

- Predictive Line Rating In Underground Transmission Lines Going Beyond Dynamic Line Rating

Ramyar Rashed Mohassel (Ryerson University, Canada), Kaamran Raahemifar (Ryerson University, Canada) 1007

- Impact of Parameter Variation of Arc Flash on Hazard Mitigation in Low Voltage Power Systems

Abdeslem Kadri (Ryerson University, Canada), Farah Mohammadi (Ryerson University, Canada), Kaamran Raahemifar (Ryerson University, Canada) 1013

- Impact of Plug-in Electric Vehicles in Unbalanced LV Systems with Photo-Voltaic

Elham Akhavan (University of Waterloo, Canada), Mostafa Shabaan (American University of Sharjah, United Arab Emirates (UAE)), Ehab El-Saadany (Waterloo University, Canada), Fakhri Karray (University of Waterloo, Canada) 1019

Localization

- IEEE 802.11 ac based Client Centered Indoor Positioning System

Woo-Sung Jung (Portland State University, USA), Young-Bae Ko (Ajou University, Korea) 1023

- Spatial direction corrections to improve indoor localization using inertial navigation with sensors on a smartphone

Rasika Lakmal Hettiarachchige Don (University of Western Ontario, Canada), Jagath Samarabandu (University of Western Ontario, Canada) 1027

- Novel velocity model to improve indoor localization using inertial navigation with sensors on a smartphone

Rasika Lakmal Hettiarachchige Don (University of Western Ontario, Canada), Jagath Samarabandu (University of Western Ontario, Canada) 1031

- Penalty Convex-Concave Procedure for Source Localization Problem

Darya Ismailova (University of Victoria, Canada), Wu-Sheng Lu (University of Victoria, Canada) 1035

Hardware, Software, and Applications

- Intelligent Intrusion Prevention System For Households Based on System-On-Chip Computer

Md Tahmid Rashid (BRAC University, Bangladesh), Imtiaz Kalam Abir (BRAC University, Bangladesh), Niaz Sharif Shourove (BRAC University, Bangladesh), Rakibun Muntaha (BRAC University, Bangladesh), Md. Khalilur Rhaman (BRAC University, Bangladesh) 1039

- A Heterogeneous Memory Organization with Minimum Energy Consumption in 3D Chip-Multiprocessors

Arghavan Asad (Ryerson University, Canada), Salman Onsori (Bilkent University, Turkey), Kaamran Raahemifar (Ryerson University, Canada), Mahmood Fathy (Iran University of Science & Technology, Iran), Mohammad-Reza Jahed-Motlagh (Iran University of Science and Technology, Iran) 1044

- GPN Game Users Performance Data Gathering and Analysis by a Custom-Built Tool

Nick McDonald (Okanagan College, Canada), Corey Frank (Okanagan College, Canada), Youry Khmelevsky (Okanagan College, Canada), Rob Bartlett (W. T. Fast Inc., France), Alex Needham (W. T. Fast Inc., Canada) 1050

- Sport Wearable Biometric Data Encrypted Emulation and Storage in Cloud

Nick McDonald (Okanagan College, Canada), Daniel Atkinson (Okanagan College, Canada), Youry Khmelevsky (Okanagan College, Canada), Scott McMillan (XCo Tech Inc., Canada) 1054

- A review of Mobile Banking Security

Leili Nosrati (Sharif University of Technology, Iran) 1058

- Development of a Credible and Integrated Electronic Voting Machine Based on Contactless IC Cards, Biometric Fingerprint Credentials and POS Printer

Syed Mahmud Hasan (BRAC University, Bangladesh), Md Tahmid Rashid (BRAC University, Bangladesh), Shadman Sakib Chowdhury (BRAC University, Bangladesh), Md. Khalilur Rhaman (BRAC University, Bangladesh) 1063

- TEFS: A Flash File System for Use on Memory Constrained Devices

Wade Penson (University of British Columbia, Canada), Scott Fazackerley (University of British Columbia, Canada), Ramon Lawrence (University of British Columbia, Canada) 1068

- Rapid design space exploration of multi-clock domain MPSoCs with Hybrid Prototyping

Ehsan Saboori (Concordia University, Canada), Samar Abdi (Concordia University, Canada) 1073

Pathways to Sustainable Transportation

- Integration of Price-Driven Demand Response Using Plug-in Electric Vehicles in Smart Grids

Sahand Behboodi (University of Victoria & IESVic, Canada), Curran Crawford (University of Victoria, Canada), Ned Djilali (University of Victoria, Canada), David P. Chassin (Pacific Northwest National Laboratory & Battelle Memorial Institute, USA) 1079

- Implications of Transportation Electrification in Metro Vancouver

Morteza Taiebat (University of British Columbia, Canada), Omar Herrera (University of British Columbia, Canada), Farrokh Sassani (University of British Columbia, Canada), Walter Mérida (University of British Columbia, Canada) 1084

SDN

- Towards Virtualisation and Secured Software Defined Networking for Wireless and Cellular Networks

Chukwudi A. Ezefibe (Concordia University, Canada), Yousef R. Shayan (Concordia University, Canada) 1088

- Physical and Logical Topology Slicing Through SDN

Muhammad Hassan Raza (Dalhousie University, Canada), Bill Robertson (Dalhousie University, Canada), Venkatesh Samineni (Dalhousie University, Canada) 1093

- SDN Based Emulation of an Academic Networking Testbed

Muhammad Hassan Raza (Dalhousie University, Canada), Sanjoy Chowdury (Dalhousie University, Canada), Bill Robertson (Dalhousie University, Canada) 1097

- Cloud-Enabled Vehicular Congestion Estimation: An ITS Application

Sanoop Mallisery (Manipal Institute of Technology & Manipal University, India), Milad Mahbadi (Manipal Institute of Technology, Manipal University, India), Manohara Pai (Manipal Institute of Technology & Manipal University, India), Radhika M. Pai (Manipal Institute of Technology, India) 1103

Applications II

- Partially blurred Images Restoration Using Adaptive Multi-Stage Approach

Mohamed Mohamed Rehan (AvidBeam Technologies, Egypt), Ahmed Ragab (Ulm University, Germany), Yomna Hassan (Cairo University, Egypt) 1107

- A Framework for Personalized Display Systems Using Non-Intrusive Features and Interest Detection

Jawad Ateeq (Architech Labs, Canada) 1112

- Implementation of Decoders for Symmetric Low Density Parity Check Codes on Parallel Computation Platforms using OpenCL

Andrew J. Maier (University of Alberta, Canada), Bruce F. Cockburn (University of Alberta, Canada) 1116

- Fast Simulation-Based Verification of RC Power Grids

Mohammad Fawaz (University of Toronto, Canada), Farid N. Najm (University of Toronto, Canada) 1122

Signal Processing and Instrumentation

- Toward Study of Features Associated with Natural Sleep Posture using a Depth Sensor

Xuhong Liu (Simon Fraser University, Canada), Shahram Payandeh (Simon Fraser University, Canada) 1128

- Analytical solution and Parameter Assessment for heat source located under skin: An approach to chest tumor detection

Maryam Rastgar-Jazi (Ryerson University, Canada), Farah Mohammadi (Ryerson University, Canada), Kaamran Raahemifar (Ryerson University, Canada) 1134

- A Low Power Dirac Basis Compressed Sensing Framework for EEG using a Meyer Wavelet Function Dictionary

Hesham Mahrous (University of British Columbia, Canada), Rabab Ward (University of British Columbia, Canada) 1140

- Tracking hand movements and detecting grasp

Rana Sadeghi Chegani (Simon Fraser University, Canada), Carlo Menon (Simon Fraser University, Canada) 1146

- Adaptive illumination backlight panel for ELISA imaging systems

Tejaswi Ogirala (Simon Fraser University, Canada), Ashley Eapen (Simon Fraser University, Canada), Katrina G. Salvante (Simon Fraser University, Canada), Pablo Nepomnaschy (Simon Fraser University, Canada), M. Parameswaran (Simon Fraser University, Canada) 1150

Power Electronic Interfaces

- A Variable Battery Supply DC-DC Buck Converter Designed for 45nm-CMOS Technology

Igor Filanovsky (University of Alberta, Canada), Arash Fouladi (Tampere University of Technology, Finland), Jani Jarvenhaara (Tampere University of Technology, Finland), Nikolay Tchamov (Tampere University of Technology, Finland) 1154

- Comparison of Passive Rectifier Circuits for Energy Harvesting Applications

Andrés Gomez-Casseres (Corporación Unificada Nacional de Educación Superior - CUN, Colombia), Mario R. Arbulú (Corporación Unificada Nacional de Educación Superior - CUN, Colombia), Juan Franco (Corporación Unificada Nacional de Educación Superior - CUN, Colombia), Rubén Contreras (Corporación Unificada Nacional de Educación Superior - CUN, Colombia), Jesús Martínez (Corporación Unificada Nacional de Educación Superior - CUN, Colombia) 1158

- Set-Point Tracking of a DC-DC Boost Converter through Optimized PID Controllers

Jason Gu (Dalhousie University, Canada) 1164

- Optimal MPC-Based Energy Management of Multiport Power Electronics Interface for Hybrid Energy Sources

Mohamed Taha (University of Alberta, Canada), Yasser Mohamed (University of Alberta, Canada) 1169

- Modeling and Nonlinear Control of Multilevel Inverter for Photovoltaic Application

Shamsodin Taheri (Université du Québec en Outaouais, Canada), Hamed Taheri (École de Technologie Supérieure, Canada) 1175

Bio Imaging and Signal Processing

- Analyzing Multiresolution Wavelet Entropy of ECG with Visual Analytics Techniques

Mark Wachowiak (Nipissing University, Canada), Dean Hay (Nipissing University, Canada), Renata Wachowiak Smolikova (Nipissing University, Canada), David DuVal (Nipissing University, Canada), Michel Johnson (Universite de Moncton, Canada) 1180

- Real-time Heartbeat Outlier Removal in Electrocardiogram (ECG) Biometric System

Wael Louis (University of Toronto, Canada), Majid Komeili (University of Toronto, Canada), Dimitrois Hatzinakos (University of Toronto, Canada) 1185

- Vigilance lapse identification using sparse EEG electrode arrays

Narges Armanfard (McMaster University, Canada), Majid Komeili (University of Toronto, Canada), James Reilly (McMaster University, Canada), Lou Pino (InteraXon Inc., Canada) 1189

- Joint Time Invariant and Time Dependent Brain Connectivity Network Estimation

Aiping Liu (University of British Columbia, Canada), Xun Chen (Hefei University of Technology, P.R. China), Xiaojuan Dan (Xuanwu Hospital of Capital University, P.R. China), Martin McKeown (University of British Columbia, Canada), Z. Jane Wang (University of British Columbia, Canada) 1193

- Blood Vessels Extraction from Retinal Images Using Combined 2D Gabor Wavelet Transform with Local Entropy Thresholding and Alternative Sequential Filter

Kaamran Raahemifar (Ryerson University, Canada) 1197

Estimation and Prediction

- Predicting the Depth of Anaesthesia with 40-Hz ASSR

Sahar Javaher Haghighi (University of Toronto, Canada), Majid Komeili (University of Toronto, Canada), Dimitrios Hatzinakos (University of Toronto, Canada) 1202

- Maximum Likelihood Cardiac Conduction Velocity Estimation in the Presence of Ambiguities in the Locations and Activation Times of the Recording Points

Mohammad Hassan Shariat (Queen's University, Canada), Saeed Gazor (Queen's University, Canada), Damian Redfearn (Queen's University, Canada) 1206

- Two Computationally Efficient Intracardiac Conduction Velocity Estimators: Error Analysis for the Planar Wavefronts

Mohammad Hassan Shariat (Queen's University, Canada), Saeed Gazor (Queen's University, Canada), Damian Redfearn (Queen's University, Canada) 1210

- Regressing force-myographic signals collected by an armband to estimate torque exerted by the wrist: a preliminary investigation

Maram Sakr (Simon Fraser University, Canada), Carlo Menon (Simon Fraser University, Canada) 1214

- Towards efficient heart rate variability estimation in artifact-induced Photoplethysmography signals

Ahmed Alqaraawi (King Abdulaziz City for Science and Technology, Saudi Arabia), Ahmad Alwosheel (King Abdulaziz City for Science and Technology, Saudi Arabia), Amr Alasaad (King Abdulaziz City for Science and Technology, Saudi Arabia) 1218

Modeling and Control of Energy Conversion Systems

- Converter Outage Fault Ride-Through Control Strategy For Offshore MT-HVDC Network

Mohamed Abdelwahed (University of Waterloo, Canada), Ehab El-Saadany (Waterloo University, Canada) 1224

- A Parametric Dynamic Phasor Model of Line-Commutated Rectifier Systems

Yingwei Huang (University of British Columbia, Canada), Seyyedmilad Ebrahimi (University of British Columbia, Canada), Navid Amiri (University of British Columbia, Canada), Hamid Atighechi (BC Hydro, Canada), Juri Jatskevich (University of British Columbia, Canada) 1230

- A Fuzzy Set-Point Modulation Scheme for Control Systems

Steven Howell (Manitoba Hydro, Canada), Karim Fattal (University of Manitoba, Canada), Shaahin Filizadeh (University of Manitoba, Canada) 1234

- Saturable Voltage-Behind-Reactance Model of Six-Phase Synchronous Machine in Hybrid AC and DC Generation System

Navid Amiri (University of British Columbia, Canada), Seyyedmilad Ebrahimi (University of British Columbia, Canada), Yingwei Huang (University of British Columbia, Canada), Juri Jatskevich (University of British Columbia, Canada), Hermann W. Dommel (University of British Columbia, Canada) 1239

- On-board Direct-Drive Surface Permanent Magnet Synchronous Machine with Fractional-Slot Concentrated Windings for Electric Vehicles

Lakshmi Varaha Iyer (University of Windsor, Canada), Bruce Minaker (University of Windsor, Canada), Kaushik Mukherjee (Indian Institute of Engineering Science and Technology, India), Jimi Tjong (University of Windsor, Canada), Narayan Kar (University of Windsor, Canada) 1243

Machine Learning Methods and Applications

- Sampling control in environmental monitoring systems using recurrent neural networks

Obiora Ezeora (University of Pardubice, Sweden), Jana Heckenbergerova (University of Pardubice, Czech Republic), James Rodway (University of Alberta, Canada), Petr Musilek (University of Alberta, Canada) 1249

- Superpixel-based Image Recognition for Food Images

Jiannan Zheng (University of British Columbia, Canada), Z. Jane Wang (University of British Columbia, Canada), Xiangyang Ji (Tsinghua University, P.R. China) 1253

- Feature Selection to Simplify BDI for Efficient Depression Identification

Jiayue Cai (University of British Columbia, Canada), Z. Jane Wang (University of British Columbia, Canada), Silke Appel-Cresswell (University of British Columbia, Canada), Martin McKeown (University of British Columbia, Canada) 1257

- HyperSpectral Classification with Adaptively Weighted L1-norm regularization

Victor Stefan Aldea (Concordia University, Canada), M. Omair Ahmad (Concordia University, Canada), William Lynch (Concordia University, Canada) 1261

- Detection of Largest Possible Repeated Patterns in Indian Audio Songs using Spectral Features

Shashidhar G. Koolagudi (National Institute of Technology Karnataka, India), Yarlagadda V. S. Murthy (National Institute of Technology Karnataka, India), Mathew Thomas (National Institute of Technology Karnataka, India) 1265