

# Dr. Stephen Makonin, PhD, ISP, smIEEE

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## Education

### *2014 – 2010* **Doctor of Philosophy**

Simon Fraser University, School of Computing Science (Burnaby, Canada)

Thesis: Real-Time Embedded Low-Frequency Load Disaggregation

Advisor: Fred Popowich

### *2009 – 2007* **Bachelor of Technology**

British Columbia Institute of Technology

School of Computing and Academic Studies (Burnaby, Canada)

Major: Computer Systems with a Data Communications Specialization

### *1996 – 1993* **Diploma in Computer Technology**

Selkirk College (Castlegar, Canada)

### *2009* **Certificate, Electronics Technician**

George Brown College (Toronto, Canada)

## Certifications

*submitted &* **Professional Engineer (PEng)**

*under review* Association of Professional Engineers and Geoscientists of British Columbia

### *now – 2013* **Senior Member (smIEEE)**

Institute of Electrical and Electronics Engineers (IEEE), [member since 2008].

### *now – 2010* **Information Systems Professional (ISP)**

Canadian Information Processing Society (CIPS)

## Academic Experience

*now* – 2014 **Postdoctoral Fellow & Sessional Instructor**

Simon Fraser University, School of Computing Science (Burnaby, Canada)

Data analytics summary: cities and distribution area water and power data.

*now* – 2014 **Research Associate**

Simon Fraser University, School of Engineering Science (Burnaby, Canada)

2015 – 2008 **Research Associate**

British Columbia Institute of Technology, Applied Research (Burnaby, Canada)

2013 – 2012 **Research Project and Capstone Project Mentor**

British Columbia Institute of Technology, School of Energy (Burnaby, Canada)

Electrical and Computer Engineering Technology Program

## Industry Experience

2012 **Mitacs Accelerate Intern** (4 months)

Awesense Wireless Inc. (Vancouver, Canada)

Data analytics summary: analyze time series power grid data, visualize losses.

2012 – 2011 **NSERC Engage Research Assistant** (8 months)

Embedded Automation, Inc. (Surrey, Canada)

2008 – 2006 **Co-Founder & CTO**

Vvvroom.com (Burnaby, Canada)

Data analytics summary: newsfeed aggregator of thousands of feeds hourly.

2008 – 1996 **Principal & Senior Software Developer**

Oponix Systems Inc. formerly Makonin Consulting Corp. (Burnaby, Canada)

Clients incl. Telus Mobility, Vancouver Coastal Health, Sierra Wireless, Safeway

Canada, Quartech Systems, Engineering Central, ApexMail, OAN Services

Data analytics summary: 1.8 billion call records for re-rating (Telus Mobility),  
mass dynamic data conversion engine of modem activations (Sierra Wireless).

2006 **Vancouver Office Software Development Manager**

AbsolutePoker.com: ePrado Management, Inc. (Vancouver, Canada)

Data analytics summary: one million financial transactions per day.

## Publications

### BOOKS & THESES

Pacheco-Torgal, F., Rasmussen, E., Granqvist, C.-G., Ivanov, V., Kaklauskas, H. A., and **Makonin, S.**, editors (in draft). *Start-Up Creation: The Smart Eco-Efficient Built Environment*. Elsevier, ISBN: tbd.

**Makonin, S.** (2014). *Real-Time Embedded Low-Frequency Load Disaggregation*. PhD thesis, Simon Fraser University, School of Computing Science.

Bennett, D., **Makonin, S.**, Mayfield, V. W., Neustaedter, T., and Wrenn, M. R. (1997). *Visual C++ 5 Developer's Guide*. Sams Publishing, 2nd edition; Sams Publishing, ISBN: 0672310317.

### JOURNAL ARTICLES (PEER REVIEWED)

**Makonin, S.**, Ellert, B., Popowich, F., Bartram, L., Gill, B., and Bajic, I. V. (2015). AMPds: a residential house dataset of electrical, water, and gas consumption for 2 years between 2012–2014. *Scientific Data*, Nature Publishing Group, [in submission].

**Makonin, S.**, Popowich, F., Bajic, I. V., Bartram, L., and Gill, B. (2015). Real-Time Nonintrusive Load Monitoring (NILM). *Transactions on Smart Grid*, IEEE, [in submission].

**Makonin, S.** and Popowich, F. (2014). Nonintrusive Load Monitoring (NILM) Performance Evaluation: A unified approach for accuracy reporting. *Energy Efficiency*, Springer, DOI: 10.1007/s12053-014-9306-2.

**Makonin, S.**, Bartram, L., and Popowich, F. (2013). A Smarter Smart Home: Case Studies of Ambient Intelligence. *Pervasive Computing*, IEEE, 12(1):58–66.

**Makonin, S.** and Popowich, F. (2012). Home Occupancy Agent: Occupancy and Sleep Detection. *Journal on Computing*, GSTF, 2(1):182–186.

### CONFERENCE PROCEEDINGS (PEER REVIEWED)

Wallace, J., Richardson, K., Gill, B., and **Makonin, S.** (2015). Cognitive Radio Technology: System Evolution. In *Proceedings of the 4th International Conference On Wireless Networks and Embedded Systems (WECON)*.

**Makonin, S.**, Bajic, I. V., and Popowich, F. (2014). Efficient Sparse Matrix Processing for Nonintrusive Load Monitoring (NILM). In *Proceedings of the 2nd International Workshop on Non-Intrusive Load Monitoring*.

- Makonin, S.**, Guzman Flores, L., Gill, R., Clapp, R. A., Bartram, L., and Gill, B. (2014). A Consumer Bill of Rights for Energy Conservation. In *Proceedings of the 2014 IEEE Canada International Humanitarian Technology Conference (IHTC)*.
- Filsoof, R., Bodine, A., Gill, B., **Makonin, S.**, and Nicholson, R. (2014). Transmitting Patient Vitals Over a Reliable ZigBee Mesh Network. In *Proceedings of the 2014 IEEE Canada International Humanitarian Technology Conference (IHTC)*.
- Makonin, S.**, Sung, W., Dela Cruz, R., Yarrow, B., Gill, B., Popowich, F., and Bajic, I. V. (2013). Inspiring Energy Conservation Through Open Source Metering Hardware and Embedded Real-Time Load Disaggregation. In *Proceedings of the 5th IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC)*.
- Makonin, S.**, Popowich, F., Bartram, L., Gill, B., and Bajic, I. V. (2013). AMPds: A Public Dataset for Load Disaggregation and Eco-Feedback Research. In *Proceedings of the 2013 IEEE Electrical Power and Energy Conference (EPEC)*.
- Makonin, S.**, Popowich, F., Moon, T., and Gill, B. (2013). Inspiring Energy Conservation Through Open Source Power Monitoring and In-Home Display. In *Proceedings of the 2013 IEEE Power and Energy Society General Meeting*.
- Makonin, S.**, Popowich, F., and Gill, B. (2013). The Cognitive Power Meter: Looking Beyond the Smart Meter. In *Proceedings of the 2013 26th Annual IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)*.
- Makonin, S.**, Kashani, M., and Bartram, L. (2012). The Affect of Lifestyle Factors on Eco-Visualization Design. In *Proceedings of Computer Graphics International (CGI)*.
- Makonin, S.**, Pasquier, P., and Bartram, L. (2011). Elements of Consumption: An abstract visualization of household consumption. In *Smart Graphics*, volume 6815 of LNCS, pages 194–198. Springer Berlin Heidelberg.
- Makonin, S.** and Popowich, F. (2011). An intelligent agent for determining home occupancy using power monitors and light sensors. In *Toward Useful Services for Elderly and People with Disabilities*, volume 6719 of LNCS, pages 236–240. Springer Berlin Heidelberg.

#### PUBLISHED PUBLICLY AVAILABLE DATASETS

- Makonin, S.** (2015). Almanac of Minutely Power dataset (AMPds). Harvard Dataverse, V1. DOI: <http://dx.doi.org/10.7910/DVN/FIE0S4>. [to be released, previous releases 2013 and 2014 found at <http://ampds.org>].

**Makonin, S.** (2015). 2010 ZigBee Sensor Data Collected From a House (in Vancouver, Canada) Dataset. Harvard Dataverse, V1. DOI: <http://dx.doi.org/10.7910/DVN/2K9FFE>.

## POSTER SESSIONS

**Makonin, S.** (2014). Nonintrusive Load Monitoring (NILM): What an algorithm can tell you about your energy consumption. In *Poster Session at IEEE Vancouver Section Annual General Meeting*.

## TECHNICAL REPORTS

**Makonin, S.** (2012). A Visualization Prototype for Detecting Energy Losses on a Power Grid. Awesense Wireless Inc. Mitacs-Accelerate Internship.

**Makonin, S.** (2012). Approaches to Non-Intrusive Load Monitoring (NILM) in the Home. PhD Depth Report, Simon Fraser University, School of Computing Science.

**Makonin, S.** (2008). Map with Wheels. BTech Major Project Final Report. British Columbia Institute of Technology, School of Computing and Academic Studies.

## Scholarships, Awards & Grants

- 2015 IEEE Vancouver Section Leadership and Contribution Award — Initiative
- 2014, 2012 SFU GSS Professional Development Grant
- 2014 SFU Faculty of Applied Science (FAS) Graduate Fellowship (PhD)
- 2014, 2012 Ebco/Eppich Graduate Scholarships in Intelligent Systems
- 2013, 2013 SFU Travel & Minor Research Award
- 2013 BCIT School of Energy Research Seed Funding Grant
- 2013 SFU President's PhD Scholarship
- 2013, 2012 SFU Graduate Fellowship (PhD)
- 2010 BCIT Vancouver 2010 Olympic Winter Games Legacy Fund Scholarship

## Invited Talks

### INTERNATIONAL INVITATIONS

- 2015 **From Socioeconomic Concerns to Standardizing Accuracy to Water NILM**  
The 2nd EU Nonintrusive Load Monitoring Workshop (London, UK), July 8.

### BCIT TALK INVITATIONS

- 2014 **Why There Is Nothing Smart about the Current Smart Home & Smart Meter**  
BCIT, School of Construction and the Environment, Building Sciences Masters Program (Burnaby, Canada), Feb 18.
- 2014 **Using Computing and Engineering to Tackle Sustainability Problems with Energy Consumption**  
BCIT, School of Energy (Burnaby, Canada), Feb 21.

### SFU TALK INVITATIONS

- 2013 **Load Disaggregation For Energy Conservation**  
Our Own CMPT 120 Mini-Conference: Research in Computing Science, Sep 27.
- 2013 **Lightning Talks: Sustainability**  
SFU Research Commons, July 18.  
Radio broadcast: CJSF on July 25th at 2:30pm, Sustainable Futures Program.
- 2013 **The Cognitive Power Meter, Not The Smart Meter**  
SFU Computing Science GSA Scientific Colloquium, June 19.
- 2010 **An Introduction to the Smart Grid**  
SFU COGS 300 / CMPT 417 "Intelligent Systems" Course Lecture, April 8.

## Teaching Experience

- Spring 2015*, **Introduction to the Internet and the World Wide Web (CMPT 165)**
- Fall 2014* Simon Fraser University, School of Computing Science  
Students each semester: in-class 200, dist ed 225. TAs: 6.  
Instructor rating by students: A/71%, B/26%, C/3%, D/0%, F/0%.

## Service To Profession

### CONFERENCE/WORKSHOP ORGANIZING, CHAIRING & HOSTING

*now – 2014* **Local Arrangements Chair**

2016 IEEE World Congress on Computational Intelligence (WCCI)  
Vancouver, Canada. July 25 – 29, 2016

*2015* **Posters and PhD Track Chair**

Int. Conf. on Big Data and Analytics for Smart Cities (BigDASC)  
Toronto, Canada. October 13, 2015

*2015* **Technical Program Co-Chair**

6th Int. Conf. and Workshop on Computing and Communication (IEMCON)  
Vancouver, Canada. October 15 – 17, 2015

*2015* **Organizer and Host**

IEEE Vancouver Windows 10 Hackathon  
Burnaby, Canada. May 16 – 17, 2015, 28-hours

*2014* **Organizer and Host**

IEEE Vancouver Kinect and Structure Sensor Hackathon  
Burnaby, Canada. November 8 – 9, 2014, 28-hours

*2014* **Web Co-Chair**

IEEE 15th Int. Conf. on High Performance Switching and Routing (HPSR)  
Vancouver, Canada. July 1 – 4, 2014

### INVITED JOURNAL REVIEWER

*2015* IEEE Transactions on Smart Grid [regular reviewer, 1 manuscript/month]

*2015 – 2014* IEEE Transactions on Mobile Computing [periodic reviewer]

*2013* Springer's Energy Efficiency Journal [periodic reviewer]

## TECHNICAL PROGRAM COMMITTEE MEMBER

2015 – 2011 Int. Conf. on Ubiquitous Computing and Ambient Intelligence (UCAmI)  
[regular, yearly TPC member]

2015 Int. Conf. on Big Data and Analytics for Smart Cities (BigDASC)

2015 First IEEE Workshop on Pervasive Energy Services (PerEnergy)

2012 2012 IEEE International Conference on Power and Energy (PECON).

## EXTERNAL CONFERENCE REVIEWER

2015, 2013, Canadian Conference on Artificial Intelligence (Canadian AI)  
2011

## GRANTING AGENCY REVIEWER

2014 Mitacs Accelerate Grant Proposal External Reviewer

## Volunteer Work

*now* – 2014 **Chair**, IEEE Vancouver Joint Computing Chapter

*now* – 2014 **Leader & Organizer**, IEEE/SFU Internet of Things (IoT) Club

2014 – 2012 **Membership Development Chair**, IEEE Vancouver Section

2014 **Co-Chair & Treasurer**, Westside Montessori Academy PAC

2013 **Executive-At-Large**, Westside Montessori Academy PAC