

# Dr. Stephen Makonin, PhD, ISP, smIEEE

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*Citizenship:* Canadian

## Education

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

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

Thesis: Real-Time Embedded Low-Frequency Load Disaggregation

Advisor: Fred Popowich

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

British Columbia Institute of Technology

School of Computing and Academic Studies (Burnaby, Canada)

Major: Computer Systems with a Data Communications Specialization

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

Selkirk College (Castlegar, Canada)

### 2014 – **Certificate, Data Science**

Johns Hopkins University (Baltimore, United States)

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

George Brown College (Toronto, Canada)

## Certifications

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

Institute of Electrical and Electronics Engineers (IEEE)

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

Canadian Information Processing Society (CIPS)

## Academic Experience

**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.

**2014 – Research Associate**

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

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

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

Electrical and Computer Engineering Technology Program

**2008 – Research Associate**

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

## Industry Experience

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

Awesense Wireless Inc. (Vancouver, Canada)

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

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

Embedded Automation, Inc. (Burnaby, Canada)

**2006 – 2008 Co-Founder & CTO**

Vvvroom.com (Burnaby, Canada)

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

**2006 Vancouver Office Software Development Manager**

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

Data analytics summary: one million financial transactions per day.

**1996 – 2008 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).

# Publications

## BOOKS & THESES

**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.**, Bajic, I. V., and Popowich, F. (2014). Efficient Online Load Disaggregation Using a Sparse Viterbi Algorithm. *IEEE Signal Processing Letters*, [in revision].

**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. *IEEE Pervasive Computing*, 12(1):58–66.

**Makonin, S.** and Popowich, F. (2012). Home Occupancy Agent: Occupancy and Sleep Detection. *GSTF Journal on Computing*, 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 Embed-

ded 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.

## 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 SFU GSS Professional Development Grant
- 2014 SFU Faculty of Applied Science (FAS) Graduate Fellowship (PhD)
- 2014 The Franklin D. & Helen K. Van Pykstra Graduate Scholarship in Intelligent Systems (Ebco/Eppich)
- 2013 SFU Travel & Minor Research Award
- 2013 BCIT School of Energy Research Seed Funding Grant
- 2013 SFU President's PhD Scholarship
- 2013 SFU Travel & Minor Research Award
- 2013 SFU Graduate Fellowship (PhD)
- 2012 SFU Graduate Fellowship (PhD)
- 2012 SFU GSS Professional Development Grant
- 2012 The Pacific Metals/Leon Lotzkar Memorial Graduate Scholarship in Intelligent Systems (Ebco/Eppich)
- 2010 BCIT Vancouver 2010 Olympic Winter Games Legacy Fund Scholarship

## Invited Talks

### BCIT TALK INVITATIONS

- 2014 **Why There Is Nothing Smart about the Current Smart Home and 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: in-class 200, dist ed 225. TAs: 6.

## Service To Profession

### CONFERENCE/WORKSHOP ORGANIZING, CHAIRING & HOSTING

**2014 – Local Organizing Committee Member**

2016 IEEE World Congress on Computational Intelligence (WCCI)

Vancouver, Canada. July 25 – 29, 2016

**2014 Organizer and Host**

IEEE Vancouver Kinect and Structure Sensor Hackathon

Burnaby, Canada. November 8 – 9, 2014, 28-hours

**2014 Web Co-Chair**

2014 IEEE 15th International Conference on High Performance Switching and Routing (HPSR).

Vancouver, Canada. July 1 – 4, 2014

## INVITED JOURNAL REVIEWER

- 2015 IEEE Transactions on Smart Grid (2 manuscript reviews)
- 2015 – 2014 IEEE Transactions on Mobile Computing (3 manuscript reviews)
- 2013 Springer's Energy Efficiency Journal (1 manuscript review)

## TECHNICAL PROGRAM COMMITTEE MEMBER

- 2015 International Conference on Ubiquitous Computing and Ambient Intelligence (UCAmI); International Work-conference on Ambient Assisted Living (IWAAL); International Conference on Ambient Intelligence for Health (AmIHEALTH)
- 2015 First IEEE Workshop on Pervasive Energy Services (PerEnergy)
- 2014, 2013, International Symposium on Ubiquitous Computing (UCAmI); Ambient Intelligence & International Workshop on Ambient Assisted Living (IWAAL)
- 2012 2012 IEEE International Conference on Power and Energy (PECON).
- 2011 International Symposium on Ubiquitous Computing and Ambient Intelligence (UCAmI)

## 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

- 2014 – **Chair**, IEEE Vancouver Joint Computing Chapter
- 2014 – **Leader & Organizer**, IEEE/SFU Internet of Things (IoT) Club
- 2014 **Co-Chair & Treasurer**, Westside Montessori Academy PAC
- 2013 **Executive-At-Large**, Westside Montessori Academy PAC
- 2012 – 2014 **Membership Development Chair**, IEEE Vancouver Section