

# Dr. Stephen Makonin

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*Impact:* factor 6.86, h-index 8

*Citations:* 195 (as of Mar. 1, 2016)

## 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)
- 2009* **Certificate, Electronics Technician**  
George Brown College (Toronto, Canada)

## Professional Affiliation

- under review* **Professional Engineer (PEng)**  
Association of Professional Engineers and Geoscientists of BC (APEGBC)
1. Status of Academic Assessment is *completed*.
  2. Status of Experience Assessment is *in progress*.
  3. Status of Law and Ethics Seminars is *completed*.
  4. Status of Professional Practice Examination (PPE) is *completed and passed*.
- 2013 – now* **Senior Member (smIEEE)**  
Institute of Electrical and Electronics Engineers (IEEE)  
Student Member and Member since 2008.
- 2010 – now* **Information Systems Professional (ISP)**  
Canadian Information Processing Society (CIPS)

## Research Experience

- 2014 – now* **Postdoctoral Fellow & Research Associate**  
Simon Fraser University, School of Engineering Science (Burnaby, Canada)  
Advisor: Ivan V. Bajic
- 2014 – 2015* **Postdoctoral Fellow & Sessional Instructor**  
Simon Fraser University, School of Computing Science (Burnaby, Canada)  
Advisors: Wolfgang Stuerzlinger (postdoc) & Anthony Dixon (instructor)
- 2008 – 2015* **Research Associate**  
British Columbia Institute of Technology, Applied Research (Burnaby, Canada)

## Graduate Student Co-/Supervision

- 2014 – 2015* **Co-Supervised Bradley Ellert — MSc Thesis (defended Aug 17, 2015)**  
Simon Fraser University, School of Computing Science (Burnaby, Canada)  
Thesis: Leveraging Submetered Electricity Loads to Disaggregate Household Water-Use

## Teaching Experience

- Fall 2014,* **Introduction to the Internet and the World Wide Web (CMPT 165)**
- Spring 2015* Simon Fraser University, School of Computing Science  
Students each semester: in-class section 200, dist ed section 225  
TAs/TMs: in-class section 3, dist ed section 3

## Industry Experience (Software Engineering)

- 2015 – now* **NSERC Engage Research Assistant**  
BC Hydro (Vancouver, Canada)
- 2014 – now* **Co-Founder & Senior Research Scientist**  
SweetLightning (Calgary, Canada)
- 2012* **Mitacs Accelerate Intern (4 months)**  
Awesense Wireless Inc. (Vancouver, Canada)
- 2011 – 2012* **NSERC Engage Research Assistant (8 months)**  
Embedded Automation, Inc. (Surrey, Canada)
- 2006 – 2008* **Co-Founder & CTO**  
Vvvroom.com (Burnaby, Canada)
- 2006* **Vancouver Office Software Development Manager**  
AbsolutePoker.com: ePrado Management, Inc. (Vancouver, Canada)
- 1998 – 1999* **Co-Founder & Applications Developer**  
Levaly Software (Vancouver, Canada)
- 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

## Scholarships, Awards & Grants

- 2011, 2015 NSERC Engage Grants (\$25k each)
  - 2015 IEEE Vancouver Section Leadership and Contribution Award — Initiative
  - 2015 NSERC Postdoctoral Fellowship (PDF) — Application Deemed Meritorious
- 2012, 2014 SFU GSS Professional Development Grant (\$500 each)
  - 2014 SFU Faculty of Applied Science (FAS) Graduate Fellowship (PhD)
- 2012, 2014 Ebco/Eppich Graduate Scholarships in Intelligent Systems
- 2013, 2013 SFU Travel & Minor Research Award
  - 2013 BCIT School of Energy Research Seed Funding Grant (\$10k)
  - 2013 SFU President's PhD Scholarship
- 2012, 2013 SFU Graduate Fellowship (PhD)
  - 2012 Mitacs Accelerate Grant (\$15k)
- 2010 BCIT Vancouver 2010 Olympic Winter Games Legacy Fund Scholarship

## Publications (see [Google Scholar](#) & [Research Gate](#))

### BOOKS & THESES

- Pacheco-Torgal, F., Rasmussen, E., Granqvist, C.-G., Ivanov, V., Kaklauskas, H. A., and **Makonin, S.**, editors (2016). *Start-Up Creation: The Smart Eco-Efficient Built Environment*. Woodhead Publishing/Elsevier, ISBN: 978-0-08-100546-0. Authored: **Makonin, S.** (2015) Chapter 18: App programming and its use in smart buildings. [in press, on sale June/2016]
- Makonin, S.** (2014). *Real-Time Embedded Low-Frequency Load Disaggregation*. PhD thesis, Simon Fraser University, School of Computing Science. [citations: 3]
- Bennett, D., **Makonin, S.**, Mayfield, V. W., Neustaedter, T., and Wrenn, M. R. (1996). *Visual C++ 5.0 Developer's Guide*. Sams Publishing, ISBN: 978-0-672-31031-7. [citations: 29]

### JOURNAL ARTICLES (PEER REVIEWED)

- Makonin, S.**, Ellert, B., Bajic, I. V., and Popowich, F. (2015). Electricity, water, and natural gas consumption of a residential house in Canada from 2012 to 2014. *Scientific Data*, NPG. [in revised submission]
- Makonin, S.**, Popowich, F., Bajic, I. V., Gill, B., and Bartram, L. (2015). Exploiting HMM Sparsity to Perform Online Real-Time Nonintrusive Load Monitoring. *IEEE Transactions on Smart Grid*, PP(99):1–11. doi: 10.1109/TSG.2015.2494592 [impact factor: 4.252]
- Makonin, S.** and Popowich, F. (2014). Nonintrusive Load Monitoring (NILM) Performance Evaluation. *Energy Efficiency*, 8(4):809–814. Springer. [impact factor: 1.060, citations: 5]
- Makonin, S.**, Bartram, L., and Popowich, F. (2013). A Smarter Smart Home: Case Studies of Ambient Intelligence. *IEEE Pervasive Computing*, 12(1):58–66. [impact factor: 1.545, citations: 24]
- Makonin, S.** and Popowich, F. (2012). Home Occupancy Agent: Occupancy and Sleep Detection. *GSTF Journal on Computing*, 2(1):182–186. [impact factor: tbd, citations: 6]

## CONFERENCE PROCEEDINGS (PEER REVIEWED)

- Makonin, S.** (2016). Investigating the Switch Continuity Principle Assumed in Non-Intrusive Load Monitoring (NILM). In *Proceedings of the 29th Annual IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)*. [to appear]
- Makonin, S.**, McVeigh, D., Stuerzlinger, W., Tran, K., and Popowich, F. (2016). Mixed-Initiative for Big Data: The Intersection of Human + Visual Analytics + Prediction. In *Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS)*, pp. 1427-1436.
- Ellert, B., **Makonin, S.**, and Popowich, F. (2015). Appliance Water Disaggregation via Non-Intrusive Load Monitoring (NILM). In *Proceedings of the EAI International Conference on Big Data and Analytics for Smart Cities (BigDASC)*.
- 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)*. [citations: 1]
- 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*. [citations 10]
- 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)*. [citations: 2]
- 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)*. [citations: 2]
- 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)*. [citations: 64]
- 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*. [citations: 2]
- 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)*. [citations: 14]
- Makonin, S.**, Kashani, M., and Bartram, L. (2012). The Affect of Lifestyle Factors on Eco-Visualization Design. In *Proceedings of Computer Graphics International (CGI)*. [citations: 11]
- Makonin, S.**, Pasquier, P., and Bartram, L. (2011). Elements of Consumption: An abstract visualization of household consumption. In *Smart Graphics*, LNCS, 6815:194–198. Springer Berlin Heidelberg. [citations: 11]
- 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*, LNCS, 6719:236–240. Springer Berlin Heidelberg. [citations: 8]

## 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*.

## PUBLISHED PUBLICLY AVAILABLE DATASETS

**Makonin, S.** (2015). *AMPds2: Almanac of Minutely Power dataset (Version 2)*, <http://dx.doi.org/10.7910/DVN/FIEoS4>, Harvard Dataverse, V1. [to be released, previous release 2013 below].

**Makonin, S.** (2015). *AMPds: Almanac of Minutely Power dataset (R2013)*, <http://dx.doi.org/10.7910/DVN/MXB7VO>, Harvard Dataverse, V1.

**Makonin, S.** (2015). *ODDs: Occupancy Detection Dataset*, <http://dx.doi.org/10.7910/DVN/2K9FFE>, Harvard Dataverse, V1.

## 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. [citations: 1]

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

## 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

- 2015 **Probabilistic Modelling and Inference with Application to Understanding Home Energy Use**  
SFU CMPT 310 "Artificial Intelligence Survey" 2-hour Course Lecture, Nov 16.
- 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” 2-hour Course Lecture, April 8.

## **Service To Profession**

### **GENERAL CHAIR & ORGANIZER**

- 2015 – now* 3rd International Workshop on Non-Intrusive Load Monitoring (NILM)  
Vancouver, Canada. May 14 – 15, 2016
- 2015* IEEE Vancouver Windows 10 Hackathon  
Burnaby, Canada. May 16 – 17, 2015, 28-hours
- 2014* IEEE Vancouver Kinect and Structure Sensor Hackathon  
Burnaby, Canada. November 8 – 9, 2014, 28-hours

### **WEBSITE & SOCIAL MEDIA CHAIR**

- 2015 – now* 14th IEEE International NEW Circuits And Systems (NEWCAS) Conference  
Vancouver, Canada. June 26 – 29, 2016
- 2015 – now* 29th Annual IEEE Canadian Conf. on Electrical and Computer Engineering (CCECE)  
Vancouver, Canada. May 15 – 18, 2016
- 2014* IEEE 15th Int. Conf. on High Performance Switching and Routing (HPSR)  
Vancouver, Canada. July 1 – 4, 2014

### **LOCAL ARRANGEMENTS CHAIR**

- 2014 – now* 2016 IEEE World Congress on Computational Intelligence (WCCI)  
Vancouver, Canada. July 25 – 29, 2016

### **TECHNICAL PROGRAM COMMITTEE (TPC) MEMBER**

- 2016* Int. Workshop on Computational Energy Management in Smart Grids (CEMiSG)
- 2015 – 2016* IEEE Workshop on Pervasive Energy Services (PerEnergy)
- 2015* Int. Conf. on Big Data and Analytics for Smart Cities (BigDASC)
- 2011 – 2015* Int. Conf. on Ubiquitous Computing and Ambient Intelligence (UCAml)
- 2012* 2012 IEEE Int. Conf. on Power and Energy (PECON).

### **INVITED JOURNAL REVIEWER (SEE [PUBLONS PROFILE](#))**

- 2015 – 2016* IEEE Transactions on Smart Grid
- 2013 – 2015* Springer’s Energy Efficiency Journal
- 2014 – 2015* IEEE Transactions on Mobile Computing

### **MISCELLANEOUS ACTIVITIES**

- 2011, 2013, 2015* External Paper Reviewer, Canadian Conference on Artificial Intelligence (AI)
- 2014* External Grant Reviewer, Mitacs Accelerate Grant Proposal

## Volunteer Work

*2014 – now* **Treasurer**, Westside Montessori Academy PAC (incl. Co-Chair for 2014/15 school year)

*2014 – 2016* **Chair**, IEEE Vancouver Joint Computing Chapter

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