

Dr. Stephen Makonin

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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

- 2016 – now* **Postdoctoral Fellow**
University of British Columbia, Electrical and Computer Engineering (Burnaby, Canada)
Advisor: Z. Jane Wang
- 2014 – 2016* **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)

- 2014 – now* **Co-Founder & Senior Research Scientist** — SweetLightning (Calgary, Canada)
- 2016* **Disaggregation/NILM Contract Scientist (6 mos.)** — Green Running (London, UK)
- 2015 – 2016* **NSERC Engage Research Assistant (6 mos.)** — BC Hydro (Vancouver, Canada)
- 2012* **Mitacs Accelerate Intern (4 mos.)** — Awesense Wireless Inc. (Vancouver, Canada)
- 2011 – 2012* **NSERC Engage Research Assistant (8 mos.)** — Embedded Automation (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

Grants & Funding

2016 IC-IMPACTS NCE Project Grant (\$133k each, 2 years, 11.2% success rate)

2011, 15, 16 NSERC Engage Grants (\$25k each, 6 months each)

2012, 14 SFU GSS Professional Development Grant (\$500 each)

2013 BCIT School of Energy Research Seed Funding Grant (\$10k, 4 months)

2012 Mitacs Accelerate Grant (\$15k, 4 months)

Publications (see citation report at end of CV)

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.

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. (1996). *Visual C++ 5.0 Developer's Guide*. Sams Publishing, ISBN: 978-0-672-31031-7.

JOURNAL ARTICLES (PEER REVIEWED)

Guzman, L., **Makonin, S.**, and Clapp, R. A. (2016). CarbonKit: a technological platform for personal carbon tracking. *Computers, Environment and Urban Systems* [impact factor: 2.092, in submission]

Bhotto, Md. Z. A., **Makonin, S.**, and Bajic, I. V. (2016). Load Disaggregation Based on Aided Linear Integer Programming. *IEEE Transactions on Circuits and Systems II: Express Briefs*, PP(99):1–5. doi: 10.1109/TCSII.2016.2603479 [impact factor: 1.136]

Makonin, S., Ellert, B., Bajic, I. V., and Popowich, F. (2016). Electricity, water, and natural gas consumption of a residential house in Canada from 2012 to 2014. *Scientific Data*, 3(160037):1–12. [impact factor: tbd]

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*, 7(6):2575–2585. [impact factor: 4.252]

Makonin, S. and Popowich, F. (2014). Nonintrusive Load Monitoring (NILM) Performance Evaluation. *Energy Efficiency*, 8(4):809–814. [impact factor: 1.183]

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: 1.836]

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

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)*.
- 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)*.
- 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*, LNCS, 6815:194–198. 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*, LNCS, 6719:236–240. 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*.

PUBLISHED PUBLICLY AVAILABLE DATASETS

Makonin, S. (2016). *AMPds2: Almanac of Minutely Power dataset (Version 2)*,
<http://dx.doi.org/10.7910/DVN/FIEoS4>, Harvard Dataverse, V1.

Makonin, S. (2013). *AMPds: Almanac of Minutely Power dataset (R2013)*,
<http://dx.doi.org/10.7910/DVN/MXB7VO>, Harvard Dataverse, V1.

Makonin, S. (2010). *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.

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.

SFU TALK INVITATIONS (A SELECTED FEW)

2013 **Lightning Talks: Sustainability**
 SFU Research Commons, July 18.
 Radio broadcast: CJSF on July 25th at 2:30pm, Sustainable Futures Program.

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

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

WEBSITE & SOCIAL MEDIA CHAIR

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

LOCAL ARRANGEMENTS CHAIR

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

TECHNICAL PROGRAM COMMITTEE (TPC) MEMBER

- 2015 – 2017 IEEE Workshop on Pervasive Energy Services (PerEnergy)
- 2016 Int. Workshop on Computational Energy Management in Smart Grids (CEMiSG)
- 2015 Int. Conf. on Big Data and Analytics for Smart Cities (BigDASC)
- 2011 – 2015 Int. Conf. on Ubiquitous Computing and Ambient Intelligence (UCAmI)
- 2012 IEEE Int. Conf. on Power and Energy (PECON)

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

- 2016 Elsevier's Applied Energy
- 2016 Nature Scientific Data
- 2016 IEEE Pervasive Computing
- 2015 – 2016 IEEE Transactions on Smart Grid
- 2013 – 2016 Springer's Energy Efficiency Journal
- 2014 – 2015 IEEE Transactions on Mobile Computing

MISCELLANEOUS ACTIVITIES

- 2011, 13, 15 **External Paper Reviewer**, Canadian Conference on Artificial Intelligence (AI)
- 2014 **External Grant Reviewer**, Mitacs Accelerate Grant Proposal

Scholarships & Awards

- 2015 IEEE Vancouver Section Leadership and Contribution Award — Initiative
- 2015 NSERC Postdoctoral Fellowship (PDF) — Application Deemed Meritorious
- 2014 SFU Faculty of Applied Science (FAS) Graduate Fellowship (PhD)
- 2012, 14 Ebco/Eppich Graduate Scholarships in Intelligent Systems
- 2013 SFU Travel & Minor Research Award (2 awards won that year)
- 2013 SFU President's PhD Scholarship
- 2012, 13 SFU Graduate Fellowship (PhD)
- 2010 BCIT Vancouver 2010 Olympic Winter Games Legacy Fund Scholarship

Volunteer Work

- 2016 – now **Vice-Chair**, IEEE Vancouver Signal Processing Chapter
- 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

Citation Counts Report

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