

Stephen Makonin, PhD, PEng, SMIEEE

Director / Innovator / Research Scientist / Data & AI Engineer



Professional Industry Experience

SENIOR RESEARCHER SCIENTIST, SIMON FRASER UNIVERSITY (SFU); CANADA | 2014.09–present

Apr. 2022 – present: I was promoted to Senior Researcher Scientist at SFU's Big Data Hub and worked on projects in power/energy, electric vehicles, healthcare, port authority, airport, and mining sectors.

Sep. 2019 – Apr. 2022: I joined the SFU's Big Data Hub team as a Research Associate working on various data and AI related projects for marine and oceans. During 2021, I co-instructed online high-intensity week-long workshops focusing on introducing data engineering and machine learning to faculty and industry professionals.

Sep. 2014 – Sep. 2019: After defending my thesis (Aug. 5), I worked as a Postdoc and Sessional Instructor. During this time I also worked as a Postdoc at the University of British Columbia for six months in 2017.

KEY ACHIEVEMENTS:

- Provide stakeholder management: translate requirements and expectations between academia and industry; e.g., smoothing over misalignment of differing goals.
- Successful at research project management, grant writing, and peer-reviewed journal and conference paper writing; e.g., managing and coordinating co-authors.
- Directed the research for a multi-year NRCan community EV charging project with the local startup Tap&Go, BC Hydro, the City of Surrey, and Chinese manufacturing company BCE.
- Managed undergrad and graduate students in their programming, paper writing, and presenting tasks.
- Participated in discussions and decision-making at, and presented findings to various Steering Committees.

RESEARCH ASSOCIATE, BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY; CANADA | 2008.02–2015.03

I worked in BCIT's Technology Centre on various software (full-stack) and data engineering applied research projects. January 2010, I went on paid professional development leave to pursue my Computing Science PhD in AI and Machine Learning at SFU.

KEY ACHIEVEMENTS:

- Successfully delivered *Map with Wheels* a Facebook + Google Maps mashup enabling employees to map and share bike routes to and from work. As the solo full-stack developer I delivered in 3 months, half of the 6-month schedule. Technologies used were Java, Apache, and MySQL (backend); with a HTML JavaScript UI.
- Successfully delivered the the *Mobile Muse* central RESTful API that integrated and facilitated web requests between multiple systems and apps. Coordinated deliverable between 5 different organizations.
- Created multiple hardware (incl. Arduino, BeagleBoard, Digi, PIC) and software (assembly, C, JavaScript, PHP) prototypes to demonstrate *Smart Microgrid* research.
- Delivered technical documents outlining requirements, timelines, and resource planning for the applied research projects. Department and project documentation was organized through a local Wikimedia wiki, which I set up and administered.

< NOTE: during this gap (2007.04–2008.02) I return to consulting at Makonin Consulting Corp, see below. >

DIRECTOR OF SOFTWARE ENGINEERING, ABSOLUTEPOKER; CANADA | 2006.04 – 2007.04

I was the Director of the Software Engineering Department at the their Vancouver (Canada) office reporting directly to the CTO based in Seoul, South Korea. My department was responsible for creating and maintaining all payment systems (front and backend) for the online poker game. Duties also included software architecture, database design, and occasional software coding.

KEY ACHIEVEMENTS:

- Successfully lead a department of of 3 software developers, 1 QA manager, and 3 QA testers.
- Delivered enhancements to payment systems, increasing transaction success rates and reducing downtime.
- Streamlined payment workflows, resulting in a 15% improvement in processing efficiency.
- Strengthened compliance and fraud prevention measures reducing chargeback rates.
- Built a cohesive and high-performing development team, improving departmental productivity and morale.

FOUNDER & SENIOR SOFTWARE ENGINEER, MAKONIN CONSULTING CORP.; CANADA | 1996–2008

I successfully delivered full-stack software engineering solutions that drove operational efficiencies and business growth. As part of my role, I often rescued multiple high-stakes projects by implementing innovative features and resolving critical issues. Contracts during this time included:

QUARTECH SYSTEMS LTD. | IT SERVICES (2007.04–2008.01)

- Led full-stack development of an interpreter dispatch system for VCH and FHA health authorities.
- Designed feature-rich WinForms applications and advance and complex SQL reports.
- Automated invoice printing and appointment reminders, streamlining key operational processes.

< NOTE: during this gap (2006.04 – 2007.04) I was a full-time management employee, see above. >

ENGINEERING CENTRAL | JOB SEARCH PLATFORM (2005.02–2006.04)

- Revived a delayed project by conducting a functionality audit, implementing missing features, and fixing bugs.
- Streamlined backend database operations and developed batch programs for automated data import/export.

SIERRA WIRELESS | WIRELESS MODEM MANUFACTURING (2001.06–2006.04)

- Designed and implemented full-stack development of:
 - a mission-critical mass dynamic data conversion engine;
 - a repair tracking (RMA) website and database; and,
 - an expert system AI model to diagnose root cause hardware failures.
- AI implementation significantly reducing troubleshooting time and improving repair accuracy.
- Developed a scheduler and extensible data description language, enhancing system flexibility.
- Integrated secure FTP, email synchronization, and encryption for efficient data transfer.

VANCOUVER COASTAL HEALTH | HEALTHCARE CAPITAL PLANNING (2005.01–2005.02)

- Designed and implemented web-based forms to enhance project tracking for capital planning initiatives.

APEXMAIL.NET | EMAIL SERVICES (2001.06–2005.01)

- Delivered full-stack solutions by creating customer management, billing systems, and server enhancements.

OAN SERVICES | TELECOM BILLING SOLUTIONS (1999.03–2001.05)

- Directed the full-stack conversion of a billing system by mentored a 12-member team.
- Built robust tools for invoice generation, stress testing, and data conversion.

CANADA SAFEWAY | GROCERY RETAIL (1998.08–1999.03)

- Engineered dynamic, interfaces for promotional material creation and financial analysis.

BCTEL MOBILITY | TELECOM (1996.05–1998.08)

- Delivered full-stack solutions automating account management processes and enhancing system uptime.
- Developed critical applications and conducted UAT sessions for seamless production rollouts.

Academic Volunteer Positions

EDITOR-IN-CHIEF (EIC), IEEE DATA DESCRIPTIONS; NEW YORK, USA | 2024.01–present

I am the Founding EIC of the journal and led/manage an 18-person Editorial Board with 4 support staff. The journal publishes peer-reviewed articles on anything data, such as datasets and data science topics.

KEY ACHIEVEMENTS:

- Successfully proposed this gold open-access journal in 2023.
- Lead a 3-phase approval process — wrote and presented proposals in all phases.
- Launched mid-2024, exceeded yearly publishing goals in only 4 months.
- Developed and documented processes and guidelines for all aspects of publishing: <https://www.ieee-data.org/>.

ADJUNCT PROFESSOR, SIMON FRASER UNIVERSITY (SFU); CANADA | 2017.08–present

A non-remunerated professorial (5-year renewable) position in the School of Engineering Science. I perform research in the areas of sustainability, disaggregation, machine learning, AI, data science, and software engineering. I am the Principal Investigator of the Computational Sustainability Lab which focuses on data and AI to solve sustainability problems (incl. economic and social impacts).

KEY ACHIEVEMENTS:

- Authored 60+ peer-reviewed journal/conference articles with 3,100+ citations (h-index 25 on [Google Scholar](https://scholar.google.com/)).
- Awarded over \$2,000,000 in various research grants (e.g., NSERC, SSHRC, Mitacs).
- Hired as consultant at Green Running (UK), and Itron (USA) for expert advice on data and AI.
- Before Covid (2019), lab grew to 6 undergrad, 4 Masters (1 visiting) and 5 PhD (4 visiting) students.

Qualifications & Achievements

EDUCATION

- Simon Fraser University (SFU), Canada — **Doctor of Philosophy (PhD)**, Computing Science, 2014
- British Columbia Institute of Technology (BCIT), Canada — **Bachelor of Technology (BTech)**, 2009
- George Brown College, Canada — **Electronics Technician Certificate**, 2009
- Selkirk College, Canada — **Business Information Systems Diploma**, 1996

CERTIFICATIONS

- Engineers and Geoscientists BC — **Professional Engineer (PEng, License # 47393)** since 2018

PROFESSIONAL AFFILIATIONS

- Sigma Xi, The Scientific Research Honor Society — Full Member since 2024
- Standards Council of Canada (SCC), RAAB/Sector: Energy IEC TC 85/WG 20 — Canada Member since 2024
- Institute of Electrical and Electronics Engineers (IEEE) — Senior Member (SMIEEE) since 2013:
 - IEEE Data Reporting Best Practices Task Force — Member since 2023
 - IEEE SA Big Data Governance and Metadata Management (IEEE P2957) — Vice-Chair since 2021
 - IEEE DataPort Steering Committee — Member since 2020

SKILLS

- Extensive experience directing a department/lab of technical personnel and engineers of various skill levels.
- Prolific writer and editor of technical documents and published articles.
- Proficient in programming in Assembly, Basic (incl. VB), C, C++, C#, HTML, Java, JavaScript, PHP, and Python.
- Expert in algorithms incl.: hidden Markov models (HMM), Markov chain, Viterbi, and knapsack.
- Expert in collecting, wrangling, and publishing data, incl. relational databases, tuples, JSON, SQL, and XML.
- Experience using/operating and programming for: DOS, iOS, Linux, macOS, VAX/VMS, Windows.