Stephen Makonin

Director & Senior Research Scientist

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Innovative Director and Senior Research Scientist with extensive experience in data science, artificial intelligence, and software engineering across academia and industry. Accomplished in leading multidisciplinary research teams, securing over $2 million in grants, and publishing 60+ peer-reviewed articles with 3,100+ citations. Proficient in stakeholder management, bridging the gap between academia and industry to drive impactful AI and big data initiatives in energy, healthcare, and sustainability. Experienced in directing complex projects, mentoring students and professionals, and contributing to global standards and best practices through IEEE leadership roles. Visionary leader with a proven track record of developing cutting-edge AI-driven solutions, optimizing data governance, and advancing research in computational sustainability.

AREAS OF EXPERTISE

- Data Science
- Machine Learning
- Software Engineering
- Research Methodologies
- Technical Communication
- Grant Writing & Funding Acquisition
- Leadership & Team Management
- Artificial Intelligence (AI)
- Stakeholder Management

Professional Experience

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

Drive innovative research and development initiatives in information technology and engineering at a university level. Lead collaboration efforts with academic and industry stakeholders to advance cutting-edge research projects. Develop and implement research methodologies for data science and AI applications. Identify and pursue funding opportunities to support ongoing research activities. Mentor and guide junior researchers and students in their academic and professional growth.

KEY ACHIEVEMENTS:

- Co-instructed high-intensity workshops on data engineering and machine learning for faculty and industry professionals, including designing and teaching a week-long session on socially responsible AI.
- Conducted applied research and instruction as a Postdoctoral Researcher and Sessional Instructor at SFU and at UBC.
- Led AI-driven research projects on marine/ocean applications as a Research Associate at SFU's Big Data Hub using DNN/LLMs.
- Bridged academia and industry by translating stakeholder requirements and aligning expectations.
- Managed research projects, secured grants, and coordinated peer-reviewed publications.
- Led a multi-year NRCan community EV charging project in collaboration with Tap&Go, BC Hydro, Powertech Labs, the City of Surrey, and BCE (Manufacturer in China).
- Supervised undergraduate and graduate students in programming, research writing, and presentations.
- Presented findings and contributed to decision-making in various Steering Committees.

LEAD 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-stake 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.

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*

- Founded and Lead a 20+ Member Editorial Board with 4 Support Staff.
- Proposed, Secured Approval, and Launched a Gold Open-Access Journal in 2024.
- Exceeded Yearly Publishing Goals within 4 months of launch (yearly goal is 20 articles published).
- Developed and Documented Publishing Processes and Guidelines [ref: *journal website*].
- Awarded *High Performer* journal status for 2024.

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

- Principal Investigator of the Computational Sustainability Lab, Focusing on AI-driven Sustainability Solutions.
- Published 60+ Peer-Reviewed Articles with 3,100+ Citations (h-index 25) [ref: *Google Scholar*].
- Secured Over $2M in Research Grants (NSERC, SSHRC, Mitacs).
- Top 5 internationally renowned researchers in load disaggregation (aka NILM) and datasets.
- Investigate social impacts and carbon footprint, including eco-currency, streaming media, and LLMs.
- Provided Expert AI and Data Consulting for Green Running (UK) and Itron (USA).
- Supervised a Research Team of 15+ Students Pre-COVID (2019).

Qualifications & Achievements

EDUCATION

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

FinTech Industry Professional (FTIP) Certification, CFI, Remote (*in progress*)

CERTIFICATIONS

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

AWARDS & ACCOLADES

Leadership & Support Appreciation Certificate, IEEE Signal Processing Society, 2017
Leadership & Contribution - Initiative Award, IEEE Vancouver Section, 2015

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

TECHNICAL PROFICIENCIES

Pogramming Languages: Assembly, Basic (GW/VB), C, C++, C#, HTML, Java, JavaScript, PHP, Python, R
Algorithms: Hidden Markov Models (HMM), Inverse Problems (e.g., Disaggregation), Viterbi, Knapsack, Regression
Data Technologies: Relational Databases, Tuples, Time-Series, JSON, SQL, XML, LLMs/ChatGPT/DeepSeek/Grok
Operating Systems: DOS, iOS, Linux, macOS, VAX/VMS, Windows