Samuel Mathews, Ph.D.

samuel@smphd.com │ smphd.com │ +1 (514) 603-3991

Career Objective

- Detail-oriented, natively-trilingual, computational researcher with 8 years of experience in data science, materials modeling and simulation, and high performance computing looking to develop complex models of materials, financial markets, and engineering problems using cutting-edge techniques and methods.

Experience

Graduate Researcher, McGill University — Montréal, Canada   May 2018 – Present

- Quantify multi-scale variations and correlations in **massive, multi-dimensional datasets** within hardware constraints.
- Extract significant conclusions from noisy, complex datasets in raw and computed signals using **Python and MATLAB**.
- Analyze **error propagation** characteristics of different solution methods and calculation techniques, effect on final properties.
- Deploy **statistical learning models** to identify trends and clustering behaviors within large-scale molecular simulations.
- Engineer scalable data processing workflows, reduce bottlenecks for large-scale **modeling across cores, threads, nodes**.
- Perform cost-benefit analysis and tune **parallel workflow performance** on CPU/GPU hardware in cloud and edge compute.

Scientific Systems Administrator, McGill University — Montréal, Canada   Jan 2021 – Present

- Manage **compute infrastructure** of the Materials Modeling Research Group: login/compute nodes, auxiliary systems.
- Orchestrate cluster resources, hardware operations, storage provisioning, networking, authentication, core services.
- Deploy workload manager, software distribution systems to **automate scalable simulation and analysis** operations.
- Train lab members in data policies and cluster usage on local and Digital Research Alliance of Canada clusters.
- Recommend upgrades, procurements, cost management, technical support, **hardware/software synergies**.

Laboratory Manager, McGill University — Montréal, Canada   Jan 2021 – Present

- Administer software licensing and core-time allocations for awarded group-wide cloud allocations.
- Direct **full-cycle hardware and software procurement**, within institutional compliance framework and budget constraints.
- **Synthesize multi-project** researcher data to develop comprehensive resource justifications and budgets for multi-year grants.

Graduate Teaching Assistant, McGill University — Montréal, Canada   Sep 2018 – Apr 2026

- Grade assignments and exams, led tutorial and lab sessions, invigilated exams for 13 undergraduate and graduate courses.
- Lecture on **advanced mathematics**, engineering optimization, high performance computation, **complex process modeling**.

Education

Doctor of Philosophy (Ph.D.), Engineering, McGill University — Montréal, Canada   Jan 2021 – Apr 2026

- **Thesis:** Multiscale Characterization of Gas Hydrates: Interfacial and Structural Aspects
- High performance modeling of gas hydrate systems and applications with molecular dynamics and density functional theory.

Master of Engineering, McGill University — Montréal, Canada   May 2018 – Jun 2020

- **Thesis:** Thermal Properties of Gas Hydrates Using Density Functional Theory
- Predicted thermal properties of sI gas hydrates from first principles using density functional theory.

Bachelor of Engineering, McGill University — Montréal, Canada   Sep 2014 – Apr 2018

Professional Development — **19** courses, workshops, and training sessions: smphd.com/education.

Awards & Achievements — **14** scholarships, awards, and recognitions: smphd.com/awards.

Publications & Talks — **7 first-author**, **4 second-author**: smphd.com/publications, **29 presentations**: smphd.com/talks.

Technical Skills

Data Science: NumPy, NumExpr, Multiprocessing, Pandas, Scikit-learn, Matplotlib, SciPy, Statistics, Version Control.

Artificial Intelligence: Classifiers, Regression, Support Vector Machine, Text Mining, Neural Network Programming.

Tools: MATLAB, Python, Bash, SQL, Excel, LaTeX, NixOS, Declarative Configuration and Deployment, Debian, Docker.

Languages: English (Native), French (Native), Spanish (Native).