Hugh Morison

235 Ypres Green SW
Calgary, AB T2T 6M4

(403)–618–1155
hugh.morison@queensu.ca
hughmorison.ca

Education

- **Ph.D. Engineering Physics** Sep. 2019 - Present
  Queen's University - Shastri Lab *Kingston, ON*
  - Experimental research in neuromorphic computing with silicon photonics. My projects have involved tasks all the way from chip layout to RF PCB design, the development of a simulation platform, and experimental demos of these chips.
  - Mitacs Accelerate Fellowship working with Huawei Canada
  - Relevant courses: Nanophotonics, Reinforcement Learning, Quantum/Nonlinear Optics, Active silicon photonic devices
- **B.A.Sc. Engineering Physics (Computer Engineering Option)** Sep. 2015 - Apr. 2019
  Queen's University *Kingston, ON*
  - Relevant courses: A.I. & Interactive Systems, Neural & Genetic Computing, Quantum Mechanics, E/M Theory, Algorithms, Computer Architecture, Image Processing, Digital Systems, Computational Engineering Physics

Work Experience

- **Teaching Assistant** Sep. 2019 - Present
  Queen's University *Kingston, ON*
  - Courses of Instruction: Fourth-year engineering physics design projects, third-year analog/digital electronics, second-year engineering physics laboratory
- **Student Programmer** May 2019 - Aug. 2019
  GEOSLOPE International *Calgary, AB*
  - Web development in ASP.NET. Implemented new payment system for web-store and integration with enterprise CRM software.

Journal Articles

- Neuromorphic photonic circuit modeling in Verilog-A
  Singh, Morison, et al. APL Photonics 7, 046103 (2022)
- Graphene-based photonic synapse for multi wavelength neural networks
  Marquez, Morison, et al. MRS Advances, vol. 5, no. 37–38
- Silicon photonics for artificial intelligence applications
  Marquez et al. Photoniques, no. 104
- Photonic pattern reconstruction enabled by on-chip online learning and inference
  Marquez et al. J. Phys. Photonics 3
- Monolithic Silicon Photonic Architecture for Training Deep Neural Networks with Direct Feedback Alignment *Filipovich et al. Preprint: arXiv:2111.06862*

Skills and Software

Languages: English, French

Programming: Python, C/C++, Verilog-A, MatLAB, LaTeX, ASP.NET, Java, VHDL

Software: Linux Command Line, Lumerical INTERCONNECT, KiCAD, KLayout, Cadence Virtuoso

Lab Skills: Optical chip alignment, DC & RF probing, Optical Spectrum Analyzers, High Speed Oscilloscopes & Waveform Generators

Fabrication Skills: PCB design, optical chip layout, wirebonding, UV lithography