Simon Geoffroy-Gagnon

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44 Tigereye Crescent
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Canada

EDUCATION

Masters in Electrical Engineering **September 2018 - Present**
Focus on Programming, Optics and Neural Networks
McGill University, Montréal, Québec

Bachelor of Applied Sciences in Electrical Engineering **April 2018**
Focus on Programming, Optics and Communications.
University of British-Columbia, Kelowna, BC

TECHNICAL SKILLS

Certifications/General
- McGill EHS Laser Safety
- McGill WHMIS 2018
- Developement and implementation of test procedures and devices
- Bilingual in French and English

Computers/Programming
- Matlab, Python, C++
- Unix, Bash/Shell, Expect, SSH
- MEEP, Lumerical, LTSpice
- Git
- SolidWorks
- Microsoft Office, LaTeX

Lab/Technical
- Oscilloscope/Signal Generator
- Multimeter
- Soldering/Breadboard
- Optical Components
- Spectrometer
- Microelectronic Boards

MEMBERSHIPS

IEEE Student Member **May 2019 – Present**
OSA Student Member **May 2019 – Present**

WORK EXPERIENCE

Yukon University - Northern Energy Innovation **September 2018 – present**
Research Assistant Whitehorse, Yukon
Implemented, with a team, MATLAB/Simulink code to build and simulate any arbitrary topology microgrid. Through this, we were able to efficiently analyze the power balance, large disturbance effects and implementation of various renewable energy sources in many northern communities including Old Crow, Inuvik, Beaver Creek, Kinngait, Arviat, and Łutselk'e.

Yukon Research Center - Northern Energy Innovation **May 2018 – August 2018**
Research Assistant Whitehorse, Yukon
Created a series of general user interfaces (GUIs) and scripts in MATLAB/Simulink to automate of the creation and simulation of microgrids. This scope, for which I was responsible and lead a team of students, has reduced the amount of person-hours rendering the simulation of 5 separate communities possible in the time it took to simulate a single one without the automation.
Designed the GUIs and scripts to be softcoded and throughoutly commented, saving time for the next researchers who work on updating the microgrid GUIs.
Gained valuable knowledge concerning microgrids within a northern context and gained insight on the use of renewable energy and AI methods in the north from a electric power utility perspective.

Bosch **January 2017 – August 2017**
Engineering Intern Stuttgart, Germany
Tested various concepts related to optics using the optical simulations software Lumerical to aid a large team

of engineers towards finding suitable LiDAR configurations.
Presented the work to the rest of the engineering team in a way that was accessible to peers not versed in the subject at hand.

Integrated Optics Laboratory **January 2015 – February 2016**
Student Work Study Program UBC Okanagan
Simulated electrodynamical effects using the openSource program MEEP to better understand optical properties of dielectric spheres.
Analyzed the properties of semiconductors in the form of nanocrystals on millimeter and micrometer sized spheres

NSERC USRA, Integrated Optics Laboratory **September 2014 – December 2014**
Research Assistant UBC Okanagan
Designed and built experimental pump-probe setups used to investigate all-optical switching.
Created a shell script to automate Matlab simulations on a remote server, allowing for over 85 000 computing hours to be completed in under six months.

Sierra Wireless **May 2014 – August 2014**
Firmware Designer Vancouver
Debugged and improved existing firmware for LTE and wireless modems with a team of over 20 firmware engineers.
Designed and implemented a program to replace hard coded values in a modem with user input files using the knowledge acquired from the first two months of work.

TECHNICAL PROJECTS

Masters Research Project **January 2019 – Present**
Optical Neural Networks
Was part of a research group studying the various topologies of MZI-based optical processors to be used in optical neural networks.
Self-guidance, teamwork and personal goal settings are all very beneficial for this project.
Modifying an existing Python library, Neuroptica, was used for this analysis.

CAPSTONE Design Project **September 2017 – April 2018**
LiDAR for Unmanned Underwater Vehicle
Lead a team of 4 engineers in the design and testing of a device used to obtain a distance reading using a laser and a camera.
Time management, teamwork, and a strict budget with a list of requirements for the end product were involved in this project.
Programming elements include Raspberry Pi (Python) and MATLAB for data acquisition and analysis.

Microcomputer Engineering Design Project **January 2015 – April 2015**
Melodic Glove
Designed, with another student, a melodic glove that output a sound for every finger bend and increased the octave by bending the thumb.

ACTIVITIES

Volunteering for IEEE Talks **January 2019 – December 2019**
Helped organize various IEEE Photonics Talks for McGill's Electric and Computer Engineering department
IEEE Student Resource Center **September 2017 – April 2018**
Participated in the management of a small electronics lab on campus sponsored by IEEE.

Helped host workshops for younger students to learn skills such as soldering and Arduino / MATLAB programming.
Assisted other students with course projects and taught basic lab skills.
Volunteered on average four hours weekly to assist other students in the lab.

PUBLICATIONS

ARTICLES

- Shokraneh, F., **Geoffroy-Gagnon, S.**, Nezami, M. S. and Liboiron-Ladouceur, O., *A Single Layer Neural Network Implemented by a* 4×4 *MZI-Based Optical Processor*, IEEE Photonics Journal, vol. 11, no. 6, pp. 1-12, Dec. 2019, Art no. 4501612, doi: 10.1109/JPHOT.2019.2952562.

- Born, B., Hritovski, I. R., **Geoffroy-Gagnon, S.**, and Holzman, J. F., *All-optical retro-modulation for free-space optical communication*, Optics Express 26 (4), 5031 (2018)

- Born, B., **Geoffroy-Gagnon, S.**, Krupa, J. D. A., Hristovski I. R., Collier, C. M., and Holzman, J. F., *Ultrafast All-Optical Switching via Subdiffractional Photonic Nanojets and Select Semiconductor Nanoparticles*, ACS Photonics 3 (6), 1095-1101 (2016)

- Born, B., Krupa, J. D. A., **Geoffroy-Gagnon, S.** , Hristovski, I. R., Collier, C. M., and Holzman, J. F., *Ultrafast Charge-Carrier Dynamics of Copper Oxide Nanocrystals*, ACS Photonics 3 (12), 2475–2481 (2016)

- Born, B., Krupa, J. D. A., **Geoffroy-Gagnon, S.**, and Holzman, J. F., *Integration of photonic nanojets and semiconductor nanoparticles for enhanced all-optical switching*, Nature Communications 6, 8097 (2015)

- Jin, X., Hristovski, B. A., Collier, C. M., **Geoffroy-Gagnon, S.**, and Holzman, J. F., *Ultrafast all-optical technologies for bi-directional optical wireless communications*, Optics Letters 40 (7), 1583-1586 (2015)

CONFERENCE PROCEEDINGS

- **Geoffroy-Gagnon, S.**, Shokraneh, F., Liboiron-Ladouceur, O., *Analysis of Two MZI-Based Topologies for Optical Neural Network*, Photonics North (2020).
- **Geoffroy-Gagnon, S.**, Shokraneh, F., and Liboiron-Ladouceur, O., *Analysis of an Analog Optical Neural Network*, Frontiers in Optics + Laser Science APS/DLS, The Optical Society (Optical Society of America, 2019), paper JW3A.96.
- Born, B., Krupa, J. D. A., **Geoffroy-Gagnon, S.**, and Holzman, J. F.,*Ultrafast all-optical switching with photonic nanojets and semiconductor nanoparticles*, SPIE Photonics West, San Francisco, USA, February (2016).
- Born, B., **Geoffroy-Gagnon, S.**, and Holzman, J. F., *An investigation of semiconductor nanoparticles for application to all-optical switching*, SPIE Photonics West, San Francisco, USA, February (2016).
- Jin, X., Hristovski, B. A., Collier, C. M., **Geoffroy-Gagnon, S.**, Born, B., Holzman, J. F., *Spherical transceivers for ultrafast optical wireless communications*, SPIE Photonics West, San Francisco, USA, February (2016).
- Born, B., Krupa, J. D. A., **Geoffroy-Gagnon, S.**, and Holzman, J. F., *Ultrafast all-optical switching of nanoparticle composites*, Multidisciplinary Undergraduate Research Conference, (2013). [Non-Refereed]

INTERESTS

Mountain Biking
Backcountry Skiing

Hiking / Canoeing / Camping

HONORS

NSERC Graduate Scholarship - Masters Program	**2019-2020**
IT Yukon Scholarship	**2017**
Deputy Vice-Chancellor Scholarship for Continuing Students	**2014 – 2017**
NSERC Undergraduate Student Research Award	**2014**
Award of excellence for the University Of British Columbia	**2013**
Top 25% on the Waterloo Problem Solving Exam	**2012**
Yukon Excellence Award	**2009 – 2012**

[References to be supplied upon request]