MATTHEW FILIPOVICH

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EDUCATION

M.A.Sc. Neuromorphic Photonics and Machine Learning Expected: May 2020 - April 2022
Queen's University

B.A.Sc. Engineering Physics Specializing in Computing Sep 2016 - Apr 2020
Queen's University *GPA: 4.02/4.3*

PROFESSIONAL EXPERIENCE

Neurmorphic Photonics Researcher May 2019 - Present
Queen's University - Shastri Lab

- Designed a novel neuromorphic photonic architecture that executes the backpropagation learning algorithm to train artificial neural networks directly on silicon photonic chips.
- Developed simulations in Python using collected experimental data.

Teaching Assistant for Computer Engineering Course Sep 2017 - Apr 2020
Queen's University

- Assessed weekly students' evaluations in C++ and MATLAB and offered constructive feedback to improve their computer programming skills.
- Collaborated with professor and fellow teaching assistants to ensure an excellent quality course.

Chemical Engineering Researcher Apr 2017 - Aug 2017
Universidad de Costa Rica - Lanamme Laboratory

- Co-authored a research paper, published in the peer-reviewed journal *Energy & Fuels*, concerning the oxidative and thermoreversible aging of asphalt.
- Research findings offer recommendations for improving future government testing procedures, extending pavement longevity, and reducing annual maintenance costs.
- Designed and performed experiments using calorimetry, spectroscopy, and rheology techniques to determine the correlation between organic fractional components and thermodynamic properties.

LEADERSHIP EXPERIENCE

Technical Captain May 2019 - Apr 2020
Queen's Hyperloop Design Team

- Managed a team of 70+ students to design, manufacture, and present a prototype hyperloop pod.
- One of 21 teams accepted to compete in the 2019 Hyperloop Pod Competition held by SpaceX.
- Oversaw the SolidWorks CAD model and engineering design reports delivered to SpaceX.
- Established team goals and facilitated engagement of all members through effective project management strategies, transparent communication, and leading team-wide meetings.

HONOURS AND AWARDS

NSERC - Michael Smith Foreign Study Supplements [National Award] 2020

Vector Institute Scholarship in Artificial Intelligence [Provincial Award] 2020

NSERC Canadian Graduate Scholarship - Master's Program [National Award] 2020

Tri-Agency Recipient Recognition Award, Queen′s University 2020

PUBLICATIONS

- **Filipovich M. J.** and Hughes S. (2020). Space-Time Computation and Visualization of Electromagnetic Fields and Potentials Generated from Moving Point Charge. Preprint.
- **Filipovich M. J.**, Guo Z., Marquez B. A., Morison H. D., and Shastri B. J. (2020). *Training Deep Neural Networks in Situ with Neuromorphic Photonics* [Paper presentation]. IEEE Photonics Conference (IPC).
- Marquez B. A., Morison H., Guo Z., **Filipovich M. J.**, Prucnal P. R., and Shastri B. J. (2020). Graphene-Based Photonic Synapse for Multi Wavelength Neural Networks. *MRS Advances, 5*, 1909–1917.
- Berkowitz M., **Filipovich M. J.**, Baldi A., Hesp S. A. M., Aguiar-Moya J. P., and Loria-Salazar L. G. (2019). Thermoreversible Aging Effects on Performance-Based Rheological Properties of Six Latin American Asphalt Binders. *Energy & Fuels, 33*, 2604-2613.