Nicholas Kwan

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Education

University of Toronto Sept. 2023 – Present
MASc, Electrical Engineering *Toronto, ON, Canada*
- Supervisor: Prof. Wei Yu

University of British Columbia Sept. 2017 – May 2023
BASc, Engineering Physics, Minor Hons. Math *Vancouver, BC, Canada*
- Thesis: Constructions for Nonadaptive Tropical Group Testing
- Supervisor: Prof. Lele Wang

Research Experience

Graduate Research Assistant Sept. 2023 – Present
U of T Electrical Engineering, Supervisor: Prof. Wei Yu *Toronto, ON, Canada*
- Developing identification codes for scheduling in massive random access.

NSERC USRA Undergraduate Research Assistant May 2023 – Sept. 2023
UBC ECE, Supervisor: Prof. Lele Wang *Vancouver, BC, Canada*
- Project: High Dimensional Expanders
- Surveyed recent results on high dimensional expanders and applications to long-standing problems in coding and sampling.
- Presented material weekly to reading group.

NSERC USRA Undergraduate Research Assistant May 2020 – Sept. 2020
UBC ECE, Supervisor: Prof. Maryam Kamgarpour *Vancouver, BC, Canada*
- Project: Finding Nash Equilibria in Multi-agent Systems
- Tested algorithms to find Nash Equilibria in different classes of games.
- Found conditions for monotonicity in certain polymatrix games.
- Received presentation award at the 3rd BC Universities Systems and Control meeting.

Publications

1. Nicholas Kwan and Lele Wang, "Constructions for nonadaptive tropical group testing," *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Taipei, Taiwan, June 2023.

Work Experience

Undergraduate Teaching Assistant Sept. 2019 – Dec. 2020
UBC Math, UBC Electrical and Computer Engineering *Vancouver, BC, Canada*
- TA for EECE 571U 2020W, a graduate course in game theory.
- Facilitated workshops for MATH 100 2020W, Differential Calculus.
- Grader for MATH 184 2019W, Differential Calculus, and MATH 105 2019W, Integral Calculus.

Cryostat R&D Student Jan. 2019 – Apr. 2019
Center for Molecular and Materials Sciences, TRIUMF *Vancouver, BC, Canada*
- Designed, assembled, and tested cryostat inserts for a gas flow cryostat.
- Modelled and improved temperature convergence time for temperatures from 1.8 K to 250 K.

Projects

Ducted UAV Capstone Sept. 2021 – May 2022

ENPH 479 Capstone

- Designed and assembled chassis and mechanical subsystems of a controllable ducted fan drone.
- Tested and achieved stability of drone under fixed directional input.

Silicon Photonics Capstone Sept. 2020 – May 2021

ENPH 459 Capstone

- Researched and evaluated efficient simulation methods for optimizing photonic crystal cavities.
- Wrote Python code for Guided Mode Expansion simulations for cavity structures.
- Wrote Jupyter notebooks documenting the use of Legume in optimizing photonic crystal cavities.

Ackermann Steering System Design Sept. 2018 – May 2019

UBC Supermileage

- Led a group to design and fabricate Ackermann steering system for a 2229 mpg prototype vehicle.
- Designed and fabricated shell components for above vehicle.

Awards & Honors

Edward S. Rogers Sr. Graduate Scholarship 2023

Elizabeth and Leslie Gould Scholarship in Engineering 2020

Donald J. Evans Scholarship in Engineering 2019

Trek Excellence Scholarship for Continuing Students 2018, 2019

Tuum Est Experiential Award 2018

Suncor Energy Scholarship 2017–2020

Specialized Skills

Mathematics: Early graduate coursework in Algebra; Advanced undergraduate coursework in DE's, Analysis, Probability, Topology, Number Theory
CAD Software: OnShape, SOLIDWORKS
Programming: Python, MATLAB