Yi-Ming Chang

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OBJECTIVE

Keen on obtaining (**Job position title**) to apply my knowledge of programming language and physics, interest in Machine Learning and Quantum Computing.

HIGHLIGHT OF QUALIFICATIONS

- **3 research projects related to Quantum Optics, Nanophotonics, Condensed Matter**
- Proficient in **SQL, MATLAB, Java, Python (including Deep Learning, High-Performance Computational skills, Parallel simulation, Numba Complier, data visualization and analyze),** Google Analytics, **LaTex**, ImageJ, Maple, Excel, PowerPoint, Word. Familiar with **Windows and Linux computer system.**
- Quick learner and team player with strong attention to details, time management, communication skills, problem solving, multitasks and trouble shooting.

EDUCATION AND TRAINING

Master of Science, Queen's University, Kingston, ON, Canada 09/2021 – Present

- Major: **Physics, Theoretical and Computational Quantum Optics and Nanophotonics**
- Main Courses: *High Performance Computational Physics, Advanced Quantum Theory, Photonics Problem Solving, Quantum Nanophotonics*
  - **I. Master project:** Modified spontaneous emission dynamics between coupled dipoles with mechanical motion and external electric field (Skills: Python, HPC, parallel simulation, CAC, Quantum Optics).
  - **II. Course project:** Solve 1D, 2D and 3D ground-state wavefunctions using Feynman's Path Integral Monte Carlo approach with Metropolis algorithm and validate with analytical solutions (Skills: Python, HPC, parallel simulation, Numba Compiler).

Bachelor of Science, Dalhousie University, Halifax, NS, Canada 09/2017 –04/2021

- Major: **Honours in Physics, Minor in Mathematics**
- Certification: **Undergraduate Certificate Information Technology**
- Main Courses: *Topics in Numerical Computing (Machine Learning), Honour Research Project I & II, Computational Physics, Quantum Mechanics I & II, Electrodynamics I & II, and Statistical Mechanics.*
  - **I. Undergraduate project I:** Numerical simulation of linear and non-linear electron transportation using MATLAB.
  - **II. Undergraduate project II:** Polymer entanglement drives formation of fibers from stable liquid bridges of highly viscous dextran solutions (Data analyse of the raw data generated from the video of fibers formation that is created by ImageJ).

PUBLICATIONS/PRESENTATIONS

- G. Chowdhry, **Y.M. Chang**, J. Frampton and L. Kreplak, "Polymer entanglement drives formation of fibers from stable liquid bridges of highly viscous dextran solutions" *Soft Matter*, 2021. DOI: 10.1039/D0SM01550D.
- **YM. Chang**, 2021, "Non-linear Bulk Electron Transport with the McKelvey-Shockley Flux Method", *The Atlantic Undergraduate Physics and Astronomy Conference (AUPAC),* virtual conference organized by team from Dalhousie University, Halifax , NS, Feb 7th.
- **YM. Chang**, 2020, "Non-linear Bulk Electron Transport with the McKelvey-Shockley Flux Method", *The 56th Annual Canadian Undergraduate Physics Conference (CUPC),* virtual conference organized by team from University of Western Ontario, London, ON, Nov 8th.

PROFESSIONAL EXPERIENCE

Physics Researcher, Queen's University (Hughes Research Group), Kingston, ON, Canada 09/2021 – Present

- Extended a Python package to simulate moving point charges to add in mechanical motion and incident additional electric field source to dipoles, studying collective dipole effects, radiative dynamics, and connections to Cavity/Molecular Optomechanics, quantum sensing, and vacuum field fluctuations (collaborations with package developer, Matthew Filipovich).
- Required to be expertise in use of Python language with High-Performance Computational skills, parallel simulation, Numba Compiler, spatial Discrete Fourier Transform (DFT), Fast Fourier Transform (FFT), data visualization, data analysis and data organization.

Teaching Assistant, Queen's University, Kingston, ON, Canada 09/2021 – Present

- ENPH 213 Computational Engineering: Required well understanding of Python language, numerical computational methods

include Finite difference, Integration, Matrices (vectorization), Root Solver, Interpolation, Discrete Fourier Transform (DFT), Fast Fourier Transform (FFT), ODEs, and Ising model with Monte Carlo simulation. Debug student's work.

- APSC 111 Mechanics: Required well understanding of basic physics knowledge, marked exams, and prepared daily and midterm tutorial for dozens to hundreds of students. Topics including Kinematics and Relative Motion, Rotational Kinematics, Newton's Laws with Friction, Circular Motion, Work-Energy, Momentum and Centre-of-Mass.

Physics Researcher, Dalhousie University (Maassen Research Group), Halifax, NS, Canada 05/2020 – 12/2020

- Simulated linear and non-linear electron transportation with newly developed McKelvey-Shockley Flux equations in a semiconductor in response to an applied electric field by using MATLAB. Then test accuracy of the method with Boltzmann Transport equations (BTE) and compare the results with experimental data.
- Required knowledge of solid-state physics, programming language, partial differential equations, oral presentation skills and scientific writing skills

ACADEMIC SERVICES

Subcommittee of CREATE-MAPS retreat 2022 05/2022 – 06/2022
Sponsorship, Registration and Website Group of AUPAC 2021 05/2020 – 02/2021
Volunteer in the Structural Nanomechanics Lab (MATLAB and ImageJ) 06/2019 – 08/2019 & 01/2021 – 04/2021