Matthew Choi

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https://matthew9655.github.io

EDUCATION

University of Toronto, Toronto, Canada · Sep 2022 - Aug 2024
MSc in Computer Science
Supervisor: **Alán Aspuru-Guzik**
Thesis: Learning Quantum Circuits with Finetuned Pretrained Large Language Models.

University of Toronto, Toronto, Canada · Sep 2017 - Apr 2022
BA in Computer Science

PUBLICATIONS

Naixu Guo, Zhan Yu, Matthew Choi, Aman Agrawal, **Kouhei Nakaji**, **Alán Aspuru-Guzik**, Patrick Rebentrost. (2024). *Quantum linear algebra is all you need for Transformer architectures*

Ruiyu Wang, & Matthew Choi. (2023). *Large Language Models on Lexical Semantic Change Detection: An Evaluation.*

Zi-Jian Zhang, **Kouhei Nakaji**, Matthew Choi, & **Alán Aspuru-Guzik**. (2023). *A composite measurement scheme for efficient quantum observable estimation.*

Matthew Choi, Daniel Flam-Shepherd, **Thi Ha Kyaw**, & **Alán Aspuru-Guzik**. (2022). *Learning quantum dynamics with latent neural ordinary differential equations.* Phys. Rev. A, 105, 042403.

EXPERIENCE

Machine Learning Engineer — Zapata AI, Toronto
Aug 2024 - Oct 2024
- Tensorizing Generative Models

Machine Learning Engineer Intern — Zapata AI, Toronto
May 2023 - Dec 2023
- Created first-generation LLM Web Demos with Augmented Retrieval.
- Developed training scripts for finetuning LLMs with LoRA and qLoRA.
- Created core ML repo CLI for installation and testing.

Teaching Assitant — University of Toronto
Sep 2022 - Apr 2024
- CSC367: Parallel Programming
- CSC309: Web Programming

Undergraduate Researcher — University of Toronto
May 2020 - Apr 2022
- Learning Quantum Dynamics with Neural ODEs
  Advisor: **Alán Aspuru-Guzik**
- Implicitly Guiding CS1 students with Analogous Problems
  Advisor: **Michelle Craig**, **Jennifer Campbell**

Software Developer — Modiface, Toronto
May 2020 - May 2021
- Created web apps and ads for beauty product companies.
- Contributed to a financial management web application with a small group of developers using AngularJS, Stylus, CSS, and HTML

	Company Quartermaster	Singapore Armed Forces, Singapore

Feb 2015 - Dec 2016

- Maintained and helped contribute to the creation of our fraternity website
- Conducted committee meetings with other members of the fraternity

PROJECTS

Red Wine End-to-End   2024

- An end-to-end red wine classification model pipeline including EDA with pandas, model training with scikit, API creation with FastAPI and deployment with Railway or AWS ECS, CI/CD with CircleCI.

Sport Bot   2023

- Created a site scraper bot using Selenium to collect data on available court bookings and post it on Slack every morning using cron.
- Created a booking bot to book a specific court.

Capstone Project: Autonomous Vehicles   2022

- Created an algorithm to improve vehicle tracklet mismatches with graph techniques and cost heuristics using Python and Pytorch.

Disentangling Sentences   2021

- Investigated whether one could disentangle sentences with Beta Variational Autoencoders using Python and Pytorch.

TALKS AND POSTERS

Vector Institute Quantum Workshop
Host and Organizer
American Physical Society March Meeting 2021
Unsupervised Machine Learning Quantum Dynamics

EXTRA CURRICULAR

Graduate Mentor   University of Toronto, Toronto

2024

- Mentored a high school student on a computer science project to investigate whether GPT would provide better answers on high school chemistry questions with retrieval augmented generation on a high school chemistry dataset.

Curriculum Director   Project Include, Toronto

2019 - 2022

- A student-run organization that recruits university students to create a coding curriculum in Python, Java, and Javascript and subsequently teaches it to students from 9-18 years old in Toronto's priority neighborhoods.
- As the Curriculum Director, I led a team of student instructors to create curriculum and refine their presentation of the material they created.

SKILLS

Languages: Python, Javascript, HTML, CSS, C, Bash
Tools and Frameworks: Git, Linux, Pytorch, Tensorflow, Node, VueJS, React, CUDA