

# TOMMY HE

Seeking an opportunity to hone my critical thinking and leadership in the modern tech workplace

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tommyhe6

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## EDUCATION

McGill University Sept. 2020 - May 2024 (Expected)  
Joint Honors Math and Computer Science (B.Sc.)

Major GPA: 3.85

## EXTRACURRICULAR PROJECTS

ThreatMap May 2022

Hacktech hackathon top 3 ML hack

- Scrapes news to find high risk locations and levels of danger to help user safety through a website
- spaCy NER model with word2vec and Newspaper.py to identity location & risk; Flask backend with Next.js frontend

TikTok Dance Trainer Jan. 2021

McHacks hackathon: "Achievement Unlocked:" the most fun and creative game dev hack

- Gives live feedback for similarity between user's dance and target dance
- Express backend with HTML/CSS frontend; TensorFlow PoseNet to identify poses with custom similarity metric

Virtual Learning Toolbox Sept. 2020

HackMIT hackathon Top 8

- A toolbox for improved online learning including a virtual whiteboard, gesture detection, and automatic verbal comparison
- OpenCV/TensorFlow CNN for whiteboard and gesture; GloVe embeddings for paragraph similarity

Musical Transcription & Encryption/Decryption Feb. 2020

MIT Blueprint hackathon Advanced Division 3rd place

- Musical transcription with an encryption scheme based on specific pieces with automatic decoder
- Pyaudio/fast fourier transform/lilypond for transcription; decryption based on markov chain monte carlo

Chess GUI & AI bot 2019

- Chess GUI interface with LAN playability and AI bot
- tkinter/PIL for GUI; web sockets/threading for LAN play; AI trained with minimax and pruning

Chatting While Compiling 2021

- Web app that allows users to chat in private room with live code sharing and compilation
- Express/Socket.IO for backend and HTML/CSS frontend; docker containers used for code sanitization

## EXPERIENCES

Software Engineer Intern May 2022 -  
Principal Financial

- Implemented DORA metrics from commits gathered from APIs like Azure DevOps Cloud and Github Actions in AWS cloud for improved developer experience
- Collaborated with a team of 3 developers over the summer, using Git for version control, to create a polished product with best practices using services such as Lambda, Glue, Athena, S3

Cryptography Research Jan. 2022 -

- Research project with Prof. Claude Crépeau on isogeny based cryptosystems and its practicality in a post-quantum world with optimized implementation in python
- Studied state of the art papers on topics such as zkSNARKs, IOPs, multi party computations, homomorphic encryption over summer

## NOTABLE CLASSES

- COMP362: H. Algorithm Design  
Algos without efficient solutions like linear programming, approximation algorithms
- COMP551: Applied Machine Learning  
Applied algorithms in ML like random forest, NN, regression
- COMP547: Cryptography & Data Security  
Theory of classical/modern cryptosystems
- COMP562: Theory of Machine Learning  
Theoretical Justification for ML like Rademacher complexity, reinforcement learning
- COMP690: Probabilistic Analysis of Algos  
Random algos such as random graphs, walks, markov chains

## SKILLS

Languages

Python Java C++ C SQL HTML  
Javascript CSS Shell OCaml

Libraries/Services

React.js Flask.py Socket.IO PyTorch  
Numpy Pandas Matplotlib AWS