

# TOMMY HE

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

🌐 tommyhe.com

✉ tommy@tommyhe.com

📍 Montreal, Quebec

🌐 tommyhe6

🔑 THe142857

## EDUCATION

McGill University Sept. 2020 - May 2023 (Expected)

Joint Honors Math and Computer Science (B.Sc.)

Major GPA: 3.85

## EXTRACURRICULAR PROJECTS

ThreatMap May 2022

Hacktech hackathon top 3 ML hack

- Scraped 50+ news articles to find high risk locations and levels of danger to help user safety through web app
- spaCy NER model with word2vec and Newspaper.py to identify 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 through web app
- Express backend with HTML/CSS frontend; TensorFlow PoseNet to identify poses with custom similarity metric; researched 5 different similarity metrics for optimality

Virtual Learning Toolbox Sept. 2020

HackMIT hackathon Top 8

- 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

Symphonic Cipher 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

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 - Aug. 2022

Principal

- Implemented Devops DORA metrics from 1000+ commits over 2 teams in the last year gathered from APIs like Azure DevOps Cloud and Github Actions in AWS cloud for improved developer experience
- Used serverless Lambda functions in a Step function to pull and validate data
- Used Glue to write data to parquet files in S3 and Athena to query data to create SQL database
- Used Quicksight to create customizable business intelligent dashboard of data and metrics

Cryptography Research Jan. 2022 - Aug. 2022

Prof. Claude Cépeau

- Researched properties and potential uses of isogeny based cryptography in a post quantum world
- Studied SOTA papers on topics such as zkSNARKs, proof systems, multi party computation, homomorphic encryption

## NOTABLE CLASSES

- COMP551: **Applied Machine Learning**  
Applied algorithms in ML like random forest, NN, regression, SVM
- COMP547: **Cryptography & Data Security**  
Theory of classical/modern cryptosystems
- COMP562: **Theory of Machine Learning**  
Theoretical justification for ML like Rademacher complexity as well as reinforcement learning
- COMP760: **Geometry & Generative Models**  
Theory and SOTA of deep geometric generative models e.g. GANs/VAEs over manifolds
- COMP690: **Probabilistic Analysis of Algorithms**  
Random algorithms 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