PATRICK LIN

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EDUCATION

University of Toronto **Toronto, ON**

Double Major: Computer Science Specialist, Statistics Major *Sept. 2019 - May 2022*

- **GPA:** *3.63/4.00*
- **Coursework**: Multivariable Calculus, Probability & Statistics, Software Design, Data Structures & Analysis, Databases, Machine Learning, Neural Networks and Deep Learning, Probabilistic Learning and Reasoning, Data Analysis, Cognitive Psychology, Learning and Memory
- **Academic Awards:** Dean's List Scholar (Summer 2020), AP National Scholar 2018, PSAT/NMSQT Semifinalist

SKILLS

Languages: Python (numpy, matplotlib, scikit-learn, scipy), R(ggplot2, tidyverse), Java/Kotlin,

Frameworks & Tools: Git, RStudio, Android Studio, Firebase, MongoDB, LaTeX, HTML/CSS/Javascript (NodeJS, ReactJS)

EXPERIENCE

University Student Chat App *September 2020 - Present*

Chat app to help university students looking to connect with their course-mates online

- Architected using ***Java***, ***Kotlin***, Google ***Firebase*** (Firestore, RT Database, Storage), ***Android Studio***, ***XML***
  - Designed Firebase data model for minimal reads, security, and optimal user experience
  - Allows users to use a variety of features including authentication, adding/removing courses and clubs, inviting to chat and more using Firebase tools (e.g. Authentication, Firestore, Realtime Database, Storage)
  - Currently implementing periodic grouping feature using ***Google Cloud*** functions
  - Migrating project to ***Flutter***/***Dart*** for production build

Highland Park Lessons *Jun 2019 – Sept 2019*

Co-founded a company that specialized in various areas of teaching and services

- Trained 9 tennis students on fundamental techniques in one-on-one private coaching sessions
- Involved in networking and outreach efforts which lead to generating $4000 in revenue over a three-month period

Top One Education *Oct 2018 – Aug 2019*

Gave in-person academic instruction to ~10 students to help prepare for classwork, quizzes, and examinations

PROJECTS

Audio Classification (https://github.com/pl728/music) *September 2020 - Present*

Tensorflow model to classify audio samples of kick drums, snare drums, cymbals, claps, hats

- Architected using ***Tensorflow***, ***Jupyter Notebook***, ***Python*** (librosa, scipy, matplotlib)
  - Created a Deep Learning model to determine the category of EDM drum samples with 99% accuracy
  - Attempted to create a Generative Adversarial Network (GAN) for automatic generation of kick drum samples

Journal Platform *July 2020 – August 2020*

Decentralized content sharing/Q&A website to promote self-sustaining online communities

- Architected using ***MERN*** stack (***MongoDB, Express, React.js, Node.js***), ***VS Code***
  - Constructed ***RESTful API*** with Express.js, Node.js using Insomnia API design platform
  - Implemented MongoDB for storage and retrieval of users, articles and login-system with JWT auth. token
  - Created front-end with React.js, using packages such as Bootstrap, Router

Music Generation (*https://github.com/pl728/lofi-algorithm/*) *April 2020 – May 2020*

Programmatic generation of Lo-fi hip hop music with tonal music theory

- Architected using ***Python*** and various libraries like Mido, PySynth, scipy, librosa, pyo
  - Allows client to generate a relaxing, jazzy beat with one click
  - Implemented composer and processor packages to generate and render music
  - Demos of generated content available at *https://pl728.github.io/lofi-site/* for cinematic playback

Calendar Application *Jan. 2020 – April 2020*

Android Application developed in a team of five for implementation of software design patterns

- Architected using ***Java***, ***XML*** in Android Studio
- Learned how to apply Software Design patterns (i.e. SOLID principles) as seen in lecture to a real-world application

Chopsticks Reinforcement Learning (*https://github.com/pl728/q-learning-chopsticks*) *March 2020*

*Reinforcement learning with **OpenAI** Gym with custom Chopsticks virtual environment*

- Programmed a model of the chopsticks game complete with players, fingers, and game rules
- Attempted q-learning to test the existence of an optimal game strategy