

# KIERAN PARANJPE

VANCOUVER, BC & MONTREAL, QC

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## EDUCATION

### McGill University

BSc in Computer Science (AI), Minor in Cognitive Science | 4.00 GPA

August 2023 - April 2027

Montreal, QC

## SKILLS

**Languages:** C#, Java, Python, SQL, JavaScript, TypeScript, Golang, Bash, HTML, CSS, C

**Frameworks/Tools:** Git, Docker, PyTorch, React.js, Unity, Linux, Firebase

**Soft Skills:** Public Speaking, Leadership, Concise Communication, Quick Learning, Teamwork

## EXPERIENCE

### Software Developer Intern | Python, PyTorch, C#, Unity, JavaScript

May 2024 - August 2024

The Verse

Vancouver, BC / Remote

- Developed a library that **tracks breath rate in realtime** using microphone input by **training a convolutional neural network** that takes mel spectrograms as input with **PyTorch**, achieving classification accuracy of 85%.
- Created an annotated breath audio dataset with over 50 minutes of breathing samples by **implementing a web-app made with JavaScript and p5.js** that records breath audio and uploads it to a **Firebase** storage bucket.
- Ported and **optimised the PyTorch model to run in C#** so it could be used in Unity, yielding a 5x speedup by converting the model to .ONNX, and analysing running time of specific functions using the Unity profiler.
- Reverse engineered PyTorch's short time Fourier transform, spectrogram, and mel spectrogram by stepping through Python source code with the debugger and reproducing functionality in C#.
- Directed development by **leading meetings with other interns** working on the breath library.

### Software Developer | Golang

April 2024 - Current

Hack4Impact McGill

Montreal, QC

- Developing the backend of an internal logistics website to be used by Welcome Collective Montreal.
- Implemented JWT authentication middleware with Golang.

### Game Developer | C#, Unity, JavaScript, Firebase

September 2016 - August 2023

KP Games

Vancouver, BC

- Published 12 video games over 7 years** on itch.io and Google Play using Unity and C#, garnering **over 1000 users** total.
- Developed an active ragdoll platforming game by mapping the pose of a ragdoll onto an animated 3D mesh.
- Implemented a **finite state machine** and **behaviour tree** for enemy AI to improve NPC intelligence.
- Built a multiplayer first person shooter using Photon Unity Networking.

### Lead Software Engineer, Lead Robot Designer | Java, OpenCV, Android Studio, CAD

September 2019 - April 2023

FIRST Robotics (FIRST Tech Challenge & FIRST Global Challenge)

Vancouver, BC

- Captained my FIRST Tech Challenge robotics team to 1 **world-championship qualification** and multiple top 3 provincial finishes. Member of **Team Canada** for the 2022 FIRST Global Challenge in Geneva.
- Enhanced autonomous performance by applying **computer vision** techniques like AprilTag detection and colour masking.
- Implemented **odometry localisation** by combining encoder sensor data from dead wheels and measurements from an IMU.
- Developed a **custom PID solution** to control robotic arms and lifts precisely.

### Robotics Camp Instructor | Leadership, Public Speaking, Communication

March 2022 - March 2023

STEMphilic Education

Vancouver, BC

- Taught LEGO robotics (Mindstorms and SPIKE Prime) to children aged 5-13 by teaching in a classroom setting.
- Provided lesson plans tailored to student interest and ability, and offered one-on-one support for all students.

## PROJECTS

### Custom Neural Network | Python, NumPy

June 2024

- Programmed a custom feedforward neural network in Python using NumPy **without any machine learning libraries** (like PyTorch) to classify the MNIST digit dataset with **95% accuracy**.
- Implemented a deep learning network with over **25,000 trainable parameters** by researching the underlying mathematics behind back propagation and gradient descent.

### URL Shortener | Golang, TypeScript, Next.js, PostgreSQL, Docker, AWS EC2

May 2024

- Developed a **full-stack web application** to shorten URLs using a Golang server that interacts with a PostgreSQL database, running on an AWS EC2 instance with a Next.js frontend.
- Implemented **middleware that handles JSON Web Tokens (JWT)** to ensure users are properly authenticated.
- Encapsulated the backend in a Docker container so it can be easily deployed on AWS.

### Spotify MP3 Download & Stats | TypeScript, Next.js

January 2024

- Developed a web-app in TypeScript with Next.js that can **download Spotify songs without Spotify Premium**.
- Displays top songs, artists, and genres for 3 different timeframes using the **Spotify Web API**.
- Utilized the **YouTube Data API** to search for corresponding music videos to download.
- Implemented **NextAuth** to handle authentication with refresh tokens.