KIERAN PARANJPE

VANCOUVER, BC & MONTREAL, QC
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EDUCATION

McGill University August 2023 - April 2027
BSc in Computer Science (AI), Minor in Cognitive Science | 3.97 GPA *Montreal, QC*

SKILLS

Languages: C#, Java, Python, JavaScript, TypeScript, SQL, Golang, Bash, HTML, CSS
Frameworks/Tools: Git, Docker, PyTorch, React.js, Express.js, SpringBoot, Unity, Linux, Firebase
Soft Skills: Public Speaking, Leadership, Concise Communication, Quick Learning, Teamwork

EXPERIENCE

Software Developer Intern | *Java, Typescript, SpringBoot, AGILE* January 2025 - April 2025
Autodesk *Montreal, QC*

- Working on Platform Services to deliver cloud solutions for Autodesk products in architecture, media and design.
- Implemented a **cycle detection algorithm** to ensure batches of commands can be topologically sorted by combining **depth first search** and a **greedy solution to the 'hitting set problem'**, resulting in ∼30% fewer commands generated and a 10% speedup.
- Optimised a PATCH request in a Command Query Responsibility Separation (CQRS) system by **analyzing polling operations** and removing an unnecessary API request, resulting in a **250ms speedup** per operation.

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 real-time** 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#** to be used in Unity, yielding a **5x speedup** by converting the model to .ONNX, and analysing the 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.

Game Developer | *C#, Unity, JavaScript, Firebase, 3D Math, Blender* 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 applying Unity's physics engine to map rigged animations onto joints.
- Implemented **finite state machines** and **behaviour trees** alongside Unity's NavMesh across projects to bolster NPC intelligence.
- Designed and created a **multiplayer first person shooter** using Photon Unity Networking, including support for matchmaking, team game modes and free for all, automatic respawns, and synchronised movement, shooting and powerups.
- Utilised Unity Scriptable Objects to power an **inventory system** for an RPG game.

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.

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.
- Utilised the YouTube Data API to search for corresponding music videos to download.