Nathan **Kwon**

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Skills and Technologies

Languages: Java, Python, Scheme, HTML/CSS, JavaScript, LaTeX, C, C++

Frameworks/Libraries: Three.js, Tailwind, TensorFlow, Bootstrap, Flask

Tools: Blender, Vite.js, Figma, Git, Heroku

Experience

First Robotics Competition (FRC)
Vancouver, B.C.

Founder, Head of Programming, & Co-Captain
Sept. 2019 - Jun. 2021

- Used **TensorFlow**, **Java**, and **Telemetry** data to build programs for the robot to move autonomously and via remote-control
- Successfully represented Canada out of **100** teams at Worlds in inaugural season: collectively engineered, tested, and problem-solved robot mechanisms, as coding captain of a **15** member cohesive team.
- Nurtured team's growth into **3** separate teams and **40** members
- Developed clear and effective communication skills through working as a team and teaching others

Stanford Pre-Collegiate Studies (SPCS)
Aug. 2020

- 1-month introductory artificial intelligence course offered by Stanford University
- Used **Python**, **Google TensorFlow**, and **Keras** to implement deep learning, resulting in a final project predicting COVID-19 trends

Canadian Computing Competition
Feb. 2017 - 2020

- Earned Certificates of Distinction for placing in the **top 25%** of the Junior and Senior competitions
- Coded in **C**, **Java**, and **Python**

Projects

Loose-Leaf Tunes
HTML, CSS, JavaScript, JQuery, BootStrap

- Designed a full-stack web application that analyzes text and composes music according to its tone
- Incorporated the **Microsoft Azure API** to analyze overall mood of the user's inputs
- Implemented **Markov Chains** in JavaScript to determine the next note generated and assess the probability of each consecutive note
- Communicated as part of a 4-person team and presented at Hack the North

SudokuAI
Java

- Researched and created a sudoku AI in **Java** that achieves sudoku solutions **under 1 second**
- Implemented using **Depth First Search**, **Algorithm X**, and **Dancing Links** algorithms
- Constructs **possibility matrices** and **doubly-linked lists** to maximize program's solving speed

Tetris
Python, Curses

- Developed a single-player Tetris game in **Python**
- Can evaluate moves based on **heuristics** like height of columns, complete lines, holes, and bumpiness
- **Next Steps**: Apply a **genetic algorithm** to create a Tetris AI that can be toggled on and off by the player

Education

University of Waterloo
Waterloo, ON

Bachelor of Computer Science, Honours, Co-op
Sept. 2021 - Aug. 2026

- GPA - 3.93
- President's Scholarship of Distinction