Bruce Wang

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Education

University of Waterloo 2024-Present
Bachelor of Computer Science *Waterloo, ON*

Technical Skills

Languages: Python, Java, JavaScript, TypeScript, SQL, C, C++, HTML, CSS, LaTeX
Frameworks: React, Node.js, Express.js, Next.js, Shadcn, Tailwind CSS, Docker, Google Cloud, Postman, FASTAPI
Libraries: OpenCV, pandas, NumPy, TensorFlow, Ultralytics, PyTorch

Experience

Software Engineer Intern May 2024 – September 2024
TopInfoDev Solutions *Vancouver, BC*

- Developed a responsive e-commerce platform using **React**, **Redux**, **Node.js**, and **MySQL**, integrating **GPT-4o** and **Google Vision** to enhance product discovery through personalized recommendations and image-based searches
- Implemented **Redis caching** for frequent database queries and designed rate-limiting middleware to handle API traffic spikes, reducing server load by **40%** during peak usage and improving response times by **35%**
- Integrated payment processing with **PayPal** and **Stripe** APIs, using **RBAC, JWT, and OAuth2** for security measures, along with dynamic tax calculation, real-time inventory validation, and automated invoice generation

Founding Software Engineer Oct 2024 – Current
Hppn.ing *Waterloo, ON*

- Implemented **semantic search** by creating **vector embeddings** using **OpenAI APIs** and **Supabase**, and utilized **cosine similarity** to deliver context-aware event matches, reducing search times to under **1 second**
- Built an AI webscraper utilizing **GPT-4o** and **BeautifulSoup**, extracting **2000+** events from **50+** websites
- Designed a recommendation system using user preferences stored in **Firebase**, generating HTML event newsletters with the highest-scoring matches and automating delivery via **SendGrid API**.

Autonomy Software Engineer Sep 2024 – Current
Waterloo Aerial Robotics Group *Waterloo, ON*

- Created real-time drone navigation and obstacle avoidance algorithms using **LiDAR**, **GPS**, and **IMU** sensor fusion.
- Implemented flight control systems in Python with a **ROS framework**, improving software modularity and scalability
- Reduced detection latency with **YOLOv11** via inference slicing, enabling navigation to landing zones within **0.5 m**.

Lead Software and Hardware Engineer Sep 2020 – Feb 2024
FIRST Tech Challenge *Vancouver, BC*

- Led robotics team to rank **9th internationally** (2022), **5th nationally** (2023), and **4th nationally** (2021).
- Designed autonomous systems with **2 cm** accuracy using encoders, odometry wheels, and IMU sensors.
- Optimized object detection with OpenCV and Numpy, improving task speed by **30%** and accuracy to **90%**.

Projects

WatClub | *Node.js, Django, Numpy, SQLite TensorFlow* Nov 2024

- Developed a club rating app for Waterloo students, placing **1st** out of **500+ participants** in CSC Project Program
- Designed **30+ REST** API endpoints enabling **JWT** authentication, commenting, saving clubs, and filtering by tags
- Created a custom **TF-IDF**-based search engine by indexing club data, reducing query responses within **1 second**
- Implemented a custom **content-based Deep Q-Network RL model** as a dynamic personalized recommendation system, with TensorFlow.js for client-side inference.

Tune2Keys | *Node.js, Flask, Music21, PyTorch, Numpy* Nov 2024

- Achieved **4th** place out of **60+** teams at HackWestern by developing a tool that converts audio to MIDI files and sheet music using a **convolutional recurrent neural network (CRNN)**, achieving a **96.72%** onset F1 score.
- Integrated **Music21** with **Node.js** and **Flask** to enable music customization and difficulty adjustment.