Bruce Wang

+1 778-321-8326 b225wang@uwaterloo.ca LinkedIn GitHub Personal Website

Education

University of Waterloo Waterloo, ON
Bachelor of Computer Science - Faculty Average: 95%

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** for 2000+ events 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**
- Designed a **content-based** and **user-based** recommendation system using user preferences stored in **Supabase**, generating HTML event newsletters with the highest-scoring matches and automating delivery via **SendGrid API**.
- Developed map clustering to dynamically group nearby events with counts using **Mapbox**

Software Developer Sep 2024 – Current
UW Computer Science Club *Waterloo, ON*

- Developed a club rating app for Waterloo students, placing **1st** out of **100+ teams** in UWCSC 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.

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**.

Projects

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

- 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.

FIRST Tech Challenge | *Java*, *OpenCV*, *GoBilda*, *Road Runner*

- 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%**.