Bruce Wang

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Technical Skills

Languages: Python, TypeScript, JavaScript, Java, SQL, C, C++, HTML, CSS, LaTeX
Frameworks: React, Node.js, Express.js, Next.js, React-Native, Flask, Django, FASTAPI, Tailwind
Technologies: TensorFlow, Supabase, Git, PyTorch, pandas, NumPy, OpenCV, Scikit-learn, Docker, Google Cloud, Postman

Experience

Software Engineer Intern   Nov 2024 – Current
Hppn.ing   *Waterloo, ON*

- Implemented **semantic search** for 10000+ 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 **cascade ranking model** based recommendation system using user preferences stored in **Supabase**, generating HTML event newsletters with the highest-scoring matches and automating delivery via **SendGrid API**.
- Built **15+** frontend components with **React Native** and **NativeWind**, including map view for 10000+ events with dynamic map clustering using **Google Maps API** and **Redis**, reducing initial rendering time to under **2 sec.**

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

- Developed a responsive e-commerce platform with **React**, **Redux**, and **Node.js**, leveraging **GPT-4o** to generate personalized recommendations for **2,000+** products and **Google Vision** to enable image-based product 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

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 content-based **Deep Q-Network RL** recommender system, with TensorFlow 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

FIRST Tech Challenge | *Java, OpenCV, GoBilda, Road Runner*
- Led a robotics team of 10 to rank **9th internationally** (2022), **5th nationally** (2023), and **4th nationally** (2021).
- Designed autonomous systems with **2 cm** accuracy using encoders, odometry wheels, and GoBILDA Strafer Chassis
- Optimized object detection with **OpenCV** and Logitech webcam, improving task speed by **30%** and accuracy to **90%**.

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.

Education

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

- **Relevant Coursework:** Data Structures and Algorithms, Linear Algebra, Designing Functional Programs