Bruce Wang

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Technical Skills

Languages: TypeScript, JavaScript, Python, Java, SQL, C, C#, C++, HTML, CSS, Racket
Frameworks: React, FastAPI, Redux, Node.js, Express.js, Next.js, React-Native, Flask, Django, Tailwind, Bootstrap
Technologies: Git, Postman, Redis, Docker, AWS, Google Cloud, Supabase, MongoDB, MySQL, Linux, TensorFlow, OpenCV

Experience

Software Engineer Intern Sept 2024 – Present
Hppn.ing *Waterloo, ON*

- Expanded user base by **200+ MAU** and developed Hppn.ing with **React Native**, **TypeScript**, **Javascript**, and **FastAPI**
- Implemented semantic search for **10000+** events using vector embeddings, **Python**, and **Supabase RPC**, leveraging cosine similarity and Sentence Transformers to deliver context-aware results in under **1 second**
- Built map view with dynamic marker clustering using **Google Maps** and **Redis**, creating **5+ RESTful** API endpoints to reduce render times by **80%** and data payload by **95%** through region-based loading and on-demand data retrieval
- Delivered **8+** client requested features by collaborating with stakeholders, increasing user engagement by **60%+**
- Deployed on AWS ECS and Vercel using **CI/CD** pipelines with GitHub Actions and Docker, ensuring **99.9%** uptime

Full-Stack Developer Intern May 2024 – Sept 2024
TopInfoDev Solutions *Vancouver, BC*

- Developed a responsive e-commerce platform with **React**, **Next.js**, **Tailwind CSS**, and **MySQL**, leveraging **OpenAI** to generate 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 with **Express.js** to handle API traffic spikes, reducing server load by **40%** during peak usage and improving response times by **35%**
- Integrated PayPal and Stripe payment methods with **JWT** and **OAuth2** for security measures, along with dynamic tax calculation, real-time inventory validation, and automated invoice generation

Autonomy Software Engineer Sept 2024 – Present
Waterloo Aerial Robotics Group *Waterloo, ON*

- Improved drone landing pad detection to **85%+** accuracy by fine-tuning **Ultralytics YOLOv8** with inference slicing, improving small object detection and enabling reliable autonomous landings across varying flying conditions
- Achieved **0.5m** landing accuracy with real-time **GPS & LiDAR** data for landing pad detection and waypoint navigation

Projects

WatClub | *React*, *JavaScript*, *Django*, *SQLite*, *Tensorflow*, *Numpy*

- Won **1st** out of **100+ teams** in Waterloo Project Program for developing a club review platform for UW students
- Designed **20+ RESTful** APIs using **Django** enabling JWT authentication, commenting, voting, and tag-based filtering
- Built a search engine using **TF-IDF** for relevance and **n-grams** enabling fuzzy search, reducing query time to under **1s**
- Periodically webscrapped **5+** websites using **Python**, **Selenium**, and **BeautifulSoup**, ensuring up-to-date club data
- Implemented a content-based **Deep Q-Network RL** recommender system, with TensorFlow for client-side inference

Football Strike AI | *Ultralytics*, *MediaPipe*, *Docker*, *Pandas*, *OpenCV*, *OpenAI*, *React*, *TypeScript*, *Flask*, *Tailwindcss*

- Developed an ML-based soccer analysis tool that provides feedback on kick form and angle, winning **$700** in prizes
- Utilized **Ultralytics YOLOv8** for ball tracking and **MediaPipe GHUM 3D** for extracting biomechanical pose metrics
- Used **Pandas** to analyze critical contact frames and **OpenCV** to overlay skeletal connections and ball trajectories
- Built a full-stack system with **React**, **Flask**, and **Docker**, integrating **OpenAI** to provide personalized feedback

Tune2Keys | *React*, *JavaScript*, *Flask*, *Music21*, *PyTorch*, *Librosa*, *Numpy*

- Created a novel **CRNN model** that transcribes piano audio into MIDI and sheet music, winning **4th** at Hackwestern
- Converted audio into **mel-spectrograms** and used a **CNN** in **PyTorch** to detect pitch, note starts, and intensity
- Processed extracted feature maps with **BiGRUs** to refine note sustains, then converted to MIDI with **Music21**

Education

University of Waterloo Waterloo, ON
Bachelor of Computer Science