Joseph Deng

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Education

University of British Columbia — Vancouver, BC
Bachelor of Science in Computer Science and Physics, Co-op program — 89.7% Average — *Sep 2023 – Apr 2028*

Skills

Languages: Python, Java, C, C++, JavaScript, TypeScript, Assembly, Ruby
Web: HTML, CSS, React.js, Node.js, Next.js, Astro.js, Bootstrap, Tailwind, Selenium, Cloudflare, Flask
Frameworks/Tools: Docker, AWS, Bedrock, Git, Matplotlib, Supabase, RESTful APIs, Blender, WSL, ROS2
AI/ML: PyTorch, Stable Diffusion, OpenCV, Scikit-learn, NumPy, Weights & Biases

Work Experience

Machine Learning Engineer Intern | *Metrized Inc.* — Jan – Sep 2025

- Adapted a **YOLO detection head** to work with a customized **DINOv2 backbone** to improve the model's performance on industrial defect detection tasks by over **20%**
- Designed a **novel classification algorithm** that reduces error rates for text and symbol classification by **over 150%** using a **custom trained mobilenet** embedding model with an **enhanced KNN algorithm**
- Engineered a **cutting edge Image to 3D AI** to generate high fidelity models of furniture, helping clients **save up to $5000 per unit** of shipping and scanning costs.
- Boosted YOLO object detection speed by **200%** by conducting **thorough benchmarks** and implementing TensorRT.
- Spearheaded the transformation of a full-stack web app into a **distributable desktop app** with Electron, rewrote and packaged python backend to use **dynamic ports**, and bootstrapped large modules to **optimize app size**

Software Engineer Intern | *CS Toolkit Inc.* — May – Jun 2024

- Executed dynamic API calls to Contentful using **Flask** to add pagination, tagging, and a search function to the company's **production blog page** within a tight **2 week timeline**
- Conducted a **multi-stage build and review process** with a professional UX designer, and reskinned the website to use a responsive, mobile-first layout to **improve user experience on small screen sizes**

Projects

Dance CV - NWHacks 2026 Winner | *Mediapipe, Typescript, React, Gemini API, Vite* | *Devpost* — Jan 2026

- Engineered a **real-time AI dance coach** using **MediaPipe Pose** and **Google Gemini API**, enabling automated video segmenting, accurate frame-by-frame pose comparison, and **hands-free voice dictation** for solo dancers.
- Resolved critical rendering bottlenecks by transitioning joint-tracking states from React hooks to **useRef**, preventing unnecessary re-renders and **increasing frame rates by 1000%** for a seamless real-time experience.
- Developed a scoring algorithm that uses **root mean square deviation** to fairly grade the user's movements

Urbanize AI | *AWS Lambda, Bedrock, Expo, React, Python* | *Demo* — Oct 2024

- Created an **AI-powered Urban Design** Improvement app that helps users identify changes that could be made in their own neighborhoods to improve sustainability, placed **top 4 out of 25+ teams** at UBC CIC Hackathon
- Engineered a serverless **AWS Lambda** function that made calls to send text and base-64 representations of images to an **generative AI model through Bedrock**
- Debugged Lambda function with Postman and CloudWatch to allow for easier testing of the API

AI Recipe Generator | *Next.js, Node.js, React.js, Three.js, OpenAI API, Bootstrap* | *Live Website* — May – Aug 2024

- Developed a **Node.js** backend that made asynchronous calls to the **OpenAI API** to create **AI-generated recipes** based on ingredients entered by the user.
- Designed the frontend with React and Three.js to insert a custom interactive **3D model generated using Blender.**
- Refactored project to use the **Next.js app router**, enabling a **serverless deployment with Vercel**

Extracurricular Involvement

Computer Vision Engineer | *UBC SUBBOTS* — Sep 2025 – Present

- Architected a **robust synthetic dataset** to **combat overfitting** using a simulated pool environment in Blender
- Developing a novel computer vision system for an autonomous underwater robot using **ROS2, Python, and YOLO** to perform **real-time object detection** in challenging underwater environments.

Website Team Lead | *UBC BIOMOD* — Oct 2024 – Present

- Led a team of four to ship a **responsive, competition-ready** website in **less than 3 weeks**
- Finalized the production site by **reviewing several pull requests** , resolving code conflicts, and fixing critical bugs
- Architected a well-structured code base and delegated tasks accordingly based on members strengths and interests