John Zhang

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TECHNICAL SKILLS

Languages: Python, Java, C++, C, SQL, TypeScript, JavaScript, VHDL, Verilog, HTML/CSS
Libraries: Numpy, PyTorch, Tensorflow, spAcy, SciPy, OpenCV, Next.js, React.js, Vue.js, Node.js, Express.js, MongoDB, Tailwind
Tools: Git, Docker, Firebase, MongoDB, AWS, MatLab, Quartus, ArduinoIDE, STM32CubeIDE, VS Code, Linux, Ubuntu

EXPERIENCE

Research Assistant January 2025 - NOW
Alberta Machine Intelligence Institute (Amii) supervised by Prof. Grzegorz Kondrak & Ning Shi (Ph.D. Candidate@) *Alberta, Edmonton*

- Automated data processing Python scripts, reducing **processing time by 40%** and improving **submission score by 25%** through optimized entity translation using Python **entity-classification** libraries like spAcy and Hugging Face Transformers for the **SemEval 2025 contest submission**.
- Integrated automation tools for data annotation and model evaluation, **reducing manual labeling time by 50%** and enhancing dataset quality, which aided in **post-contest paper submission** by providing reproducible and well-documented results.

Autonomy Software Developer September 2024 – NOW
WARG (Waterloo Aerial Robotics Group) *Waterloo, Ontario*

- Developed scripts and optimized algorithms for drone operations, enhancing **GPS data transmission**, waypoint navigation, and visual tracking efficiency
- Developed **ground-side scripts in Python** with **Mavlink** to transmit **GPS location data** from a **Raspberry Pi** to a ground station via **FTP/TCP**, improving data transfer efficiency **by 45%**
- Wrote test scripts with **PyTorch and NumPy** to validate waypoint navigation and landing accuracy, **achieving a 15% reduction in errors** and enhancing system reliability

Firmware Developer Sept 2023 – April 2024
UWaterloo BioMechatronics Design Team *Waterloo, Ontario*

- Helped develop firmware and research data collection methods for an **electromyography sleeve** that monitors and analyzes changes in muscle fibers, aiming to **improve gesture classification for stroke patients.**
- Optimized **ESP32 client-side program** for BLE data transfer, improving memory management and latency, and **reducing program build time by 25%.**
- Improved EMG sensor feedback **display accuracy by 28%** and **reduced response time by 20%** through debugging signal processing algorithms and optimizing a **Kalman Filter** for effective noise reduction.

PROJECTS

Shot | *Next.js, TypeScript, Node.js, Express.js, Cognito, S3, Tailwind, OpenCV, Python* *Sept 2024*

- Developed a **photo management platform** that enables photographers to **upload, organize, categorize** images automatically.
- Integrated **AWS S3 buckets for scalable storage** of high-resolution images and **utilized OpenCV for image processing**, enabling efficient photo uploads, management, and manipulation.
- Optimized **back-end routes with Node.js and Express** to enable seamless portfolio sharing, improving accessibility and **reducing response times by 30%** for a smoother user experience.

Verity | *React.js, Node.js, Express.js, MongoDB, Tailwind, Docker, Solidity, AstroKode* *July 2024*

- **BlockHacks 2024 Winner**, developed a comprehensive charity management web application that ensures transparency in donations and traceability of donation destinations.
- Created a **RESTAPI** to effectively manipulate charity data from a dataset, optimizing data handling and accessibility.
- Implemented smart contracts built by **AstroKode** to seamlessly interact with the blockchain network ledger.

CryptoKet Site | *React.js, TypeScript, Tailwind, Three.js, Clerk, ShadCN* *Feb 2024*

- Developed a **cryptocurrency tracking web application**, capable of displaying data charts and market caps.
- Designed with **CoinGecko RESTAPI** and manipulated its cryptocurrency data to display various types of information, such as crypto price, trading volume, and synchronous growth.

EDUCATION

University of Waterloo
Bachelor of Applied Science in Computer Engineering - President's Scholarship of Distinction $2000 *Waterloo, Ontario*