Andrew Xu

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Education

University of Waterloo Sep. 2023 – Present
Candidate for Bachelor of Software Engineering Waterloo, ON

- GPA: **4.0** (94.5/100)
- Awards: Dean's Honours List, President's Scholarship of Distinction

Technical Skills

Languages: JavaScript, TypeScript, SQL, HTML, CSS, Python, C/C++
Frameworks/Libraries: React, React Native, Node, Express, Django, Tailwind, PyTorch, NumPy, Pandas, OpenCV
Tools: Git, MySQL, PostgreSQL, AWS (S3, EC2, RDS, Sagemaker), Postman, Expo, MLFlow, Jupyter Notebook

Experience

Software Developer Intern May 2024 – Aug. 2024
Viridien *Calgary, AB*

- Engineered a convolutional neural network with **U-Net** architecture in **PyTorch**, achieving a **95%** accuracy rate in predicting first-break patterns in 3D seismic data and reducing job execution runtime by **40%**.
- Implemented **MLFlow** to manage model versioning, monitor performance, and deploy models to **SageMaker**.
- Developed a **Python** package with command-line and graphical interfaces to read and process subsurface well data.
- Leveraged **NumPy**, **Pandas**, and **SciPy** to design user-configurable network synthesis filters and Fast Fourier Transforms within the package.

Firmware Developer Dec. 2023 – Apr. 2024
University of Waterloo Formula Electric – Student Design Team *Waterloo, ON*

- Configured **ESP32-S2** board on a formula vehicle using **C** to enable receiving of **CAN** messages for HIL testing.
- Integrated board into firmware by registering read and process tasks to **FreeRTOS** and initializing **CAN** driver.
- Processed message signals using **CANdb++** to provide simulated inputs from **15+** GPIO pins to corresponding ECU sensor board.

Frontend Developer Sep. 2023 – Nov. 2023
Calgary Science Spelling Challenge *Calgary, AB*

- Refactored website using **React** and **TypeScript** to support mobile responsiveness and improve efficiency and visual appeal, reducing site load time from **2.63s** to **0.54s**, and HTTP requests from **43** to **6**.
- Established secure network status by acquiring **DKIM** and **SSL** certification and migrating web hosting to IONOS.

Projects

Webnote — Note-taking Web Extension |

- Developed a Chrome web extension enabling users to seamlessly record notes directly within their web browser.
- Engineered a Markdown text editor with **React** and the **Remark** plugin for note input, integrating the **Chrome tabs API** to associate notes with specific URLs.
- Utilized the **Django** framework to implement a user authentication system and a **REST**ful API for note persistence within a **PostgreSQL** database.

Emoticon — Emoticon Sentiment Detector |

- Achieved **96%** accuracy by training a neural network to detect the sentiment of emoticons on **900+** data points.
- Implemented backpropagation and gradient descent algorithms from scratch using **NumPy** and **OpenCV**.
- Engineered a full-stack web interface using **React**, **Node.js** and **Express.js** to enable users to request predictions from the network, and deployed frontend and backend on AWS **S3** and **EC2** instances.

Uniforum — Discussion Forum |

- Created a full-stack forum application using **React**, **Node.js**, and **Express.js**, enabling users to post content, comment, and upvote using unique profiles.
- Designed a **REST**ful API with **15+** endpoints to support full CRUD operations on user and post data within an AWS **RDS** hosted **MySQL** database.
- Integrated **bcrypt** password hashing and **JSON Web Tokens** to enhance overall user and system security.