Max **Zhou**

Electrical Engineering • University of Waterloo

+1 (587) 703 7519 • Max.zhou@uwaterloo.ca • linkedin.com/in/max-zhou • github.com/Maxonezhou • **maxzhou.me**

Skills

Programming C • C++ • Python • Matlab • ARM Assembly • VHDL • Javascript • Java • Dart • Golang
Technologies Real-time Operating Systems (RTOS) • CAN Protocol • I2C • UART • SPI • IoT • RISC/CISC • TCP/IP • Digital Logic Design
Tools Git • RTL Design • FPGA Development • Quartus Altera Software Suite • Altium Designer • Jenkins • Docker

Experience

Backend Cloud Software Developer • IBM Canada
01/2020 - 04/2020

- Worked on IBM's Planning Analytics business performance management tool utilizing IBM's **TM1 multidimensional (OLAP) database** to power collaborative data visualization and enterprise-scalable modeling
- Designed and implemented a system-wide logging feature on microservice backend covering **NodeJS, Java (AspectJ, Apache)**, and **Golang** services to centralize all logging to remote cloud service improving overall system visibility
- Fixed and reduced system-wide defects such as creating optimized widget refreshes to minimize volume of database queries by **>50%**

Hardware Virtual Forces Student Analyst • Canadian Special Operations Forces Command
01/2020 - 04/2020

- Led an end-to-end project to reduce environmental sensors footprints by over **60%** through leveraging **IoT** and **bluetooth** technologies
- Prototyped an **air quality/barometric sensor system** to detect CO2, TVOC, Pressure, and Altitude using **I2C protocol**
- Developed an **Android** dashboard using **Dart** and **Flutter** to display data and performed **time-series analysis** to detect abnormalities

Hardware Developer - Sensor Interfacing Team • WATOnomous
09/2019 - 12/2019

- Utilized **Robot Operating System (ROS)** to develop embedded systems networking and drivers for autonomous vehicles
- Implemented **TF transforms** on sensor data transformation for **LiDARS, GPS,** and **Cameras** to centralize vehicle coordinates

Firmware Developer • Ford Motor Company of Canada
05/2019 - 08/2019

- Fully developed vehicle **CAN** gateway software from database file integration to full CAN routing support following **AUTOSAR** system architecture on **Microsar.OS Real Time Operating System**
- Implemented complete **CPU, stack**, and **runtime** optimization using real-time **APIs, OS hooks,** improving overall system **parallelism**
- Optimized system **interrupt-service routines (ISR)** by reducing function overhead to decrease ISR runtime

Projects

Homemade 8-Bit Turing Complete Breadboard Computer/CPU

- Built an **8-bit Turing complete computer** from scratch using TI 7400 Series **TTL logic chips** over the course of three months
- CPU contains a **500hz clock**, **program counter**, **16bytes of RAM**, **ALU** capable of addition and subtraction, **registers** (instruction, CPU flags, general purpose), **7-segment digital display**, and **16 control lines** powered by **microcode EEPROMS**
- Developed a custom instruction set capable of **load, store, conditional branching, add, subtract, halt** and **output**

Guardian - IoT Firefighter Helmet • Hack the North 2019 Winner

- Developed an **IoT** firefighter helmet that retrieves real-time environmental data from firefighters using **I2C** sensors powered by Arduino (CO2, TVOC, UV, Temerature, humidity, pressure) and displays it on a **Vue.JS** central dashboard for emergency personnel to monitor

DetritusAI - IoT Smart City Garbage Collection System • MakeUofT 2020 Winner

- **IoT** waste collection system using object detection and **Time-of-Flight (ToF)** sensors to perform **route optimization**

FireGuard - IoT Forest Fire Detection System • Queens Hacks 2020 Winner

- Performed **time-series forecasting** on data from **IoT** beacons capable of detecting soil moisture, temperature, humidity, and air quality to determine forest fire risk and predict direction of forest fire spread

Education

University of Waterloo
Waterloo, ON

Bachelors of Applied Science, Honours Electrical Engineering
09/2018 - Present