Arthur K. Zhang

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University of Michigan, Ann Arbor, MI ***May 2022***
Bachelors in Science and Engineering in Computer Engineering *GPA: 3.9/4.0*
Coursework: Algorithms and Data Structures, Computer Organization, Circuit Analysis & Design, Digital Logic Design

Work Experience

Northrop Grumman (Software Engineering Intern) ***May - August 2020***
- Improved flight software validation lifecycle by 6 months by programming Softbench in C and Simics to simulate real time avionics behavior for NASA's JPSS and Landsat9 satellites
- Enabled satellite to ground station communications by creating a command line application that uses a multithreaded TCP/IP socket to handle custom satellite communication protocol and on board flight software for distributing telemetry commands to avionics boards

Sandia National Laboratories (Software Engineering R & D Intern) ***May - August 2019***
- Increased efficiency of radiological data collection and analysis by designing noSQL database and data processing pipeline for automating data collection and storage from testing instruments
- Optimized computation accuracy of radiation particle analysis by 20% and website reliability by implementing custom regression algorithms and a continuous integration/deployment pipeline (CI/CD) for unit and integration testing
- Published internal white paper detailing improvements on data management in complex user facing applications

Clinc (Software Engineering Intern) ***June - August 2018***
- Enhanced user experience on Spotlight AI platform by replacing existing infrastructure with a single page web application and refactoring backend APIs to decrease server response times by up to 50%
- Created an end-to-end automated testing infrastructure that reduced bugs pushed to production by 40%

Extracurricular Activities

Michigan Aeronautical Science Association (MASA) ***August 2019 - Present***
- MASA is a collegiate rocketry organization that designs and manufactures liquid fuel rockets for launch competitions
- Actively balanced liquid propellant tank pressures by designing a PCB that uses ADCs, pressure transducers, and thermocouples for sensing and writing firmware for a PID loop to control motors and valves in response to environmental conditions
- Supported rocket engine testing by bringing up an engine controller PCB using soldering techniques and oscilloscopes

Miniature Tether Electrodynamics Experiment Lab (MiTEE) **January 2020 - Present**
- Developing a miniature orbital satellite that extends service period before failure by using electrodynamic tethers to leverage atmospheric currents as a means of maintaining altitude
- Engineering onboard firmware in C to perform real-time detumbling procedure post deployment using custom linear quadratic regulator (LQR Controller) algorithm

University of Michigan Spark Electric Motorcycle Racing Team ***August 2018 - September 2019***
- Built in-browser telemetry system GUI and programmed onboard sensor payload in C for displaying real-time motorcycle performance metrics during circuit races
- Designed custom PCBs for telemetry and battery management systems using Altium Designer and programming embedded control systems in C for battery cooling systems and cell pack balancing

Skills

Computer Programming: C++, C, Javascript, Python, Java, Matlab, Tensorflow, React.js, Vue.js, Django, Selenium, MySQL
Computer-Aided Design: KiCAD, Altium PCB Designer, LTSpice, Autodesk Inventor, Autodesk Eagle, Solidworks

Projects

Dead Reckoning (https://github.com/KingArthurZ3/Dead-Reckoning) ***May - September 2019***
- A distributed embedded system for performing attitude determination using sensor fusion on inertial measurement units (IMUs) and position estimation with Kalman Filters; built for STM32 microcontroller and completely written in C
- Improved system reliability by using three microcontrollers and IMUs with custom clock synchronization procedure and Byzantine Generals algorithm for fault detection and resolution

Mr. MarketWatch (https://github.com/KingArthurZ3/MrMarketWatch) **January 2018 - August 2018**
- A collection of machine learning (ML) models that analyze stock market technical data and recommend specific stocks to buy based on their predicted profit/loss ratio; written in Python, Javascript, Tensorflow, and Vue.js
- Improving testing efficiency by 50% by automating hyperparameter tuning on Random Forest, XGBoost, and Convolutional models and a web parser for retrieving numeric financial data and automatically retraining ML models