Arthur K. Zhang

Project Portfolio: www.arthurkzhang.com

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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*
- Programmed realtime avionics simulator in C and Simics for modeling electrical system behavior on NASA's JPSS and Landsat 9 satellites to validate flight software at significantly lower cost compared to traditional validation methods
- Architected command line application in C for communicating between satellites and ground stations
- Created multithreaded TCP/IP sockets to handle custom communication protocol and defined system architecture for distributing telemetry commands to onboard avionics systems

Sandia National Laboratories (Software Engineering R & D Intern)   *May - August 2019*
- Designed noSQL database and automated data processing pipeline to analyze radiological data from nuclear detectors
- Optimized regression algorithms for radiation particle analysis to improve computation accuracy by 20% and built 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*
- Developed and optimized website features on Spotlight AI platform across full web stack to improve user experience for global corporate clients, such as isBank and USAA
- 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*
- Programming firmware for various flight boards, such as: pressurization board for actively balancing fuel tank pressures during launch using PID loops and libraries for sampling ADCs and controlling motors
- Designed custom PCB using KiCAD for sensing and controlling tank pressures used on liquid propellant rocket, with a STM32 microcontroller for managing valves, motors, thermocouples, and pressure transducers, and flash memory

Miniature Tether Electrodynamics Experiment Lab (MiTEE)   January 2020 - Present
- Working towards the development of a miniature orbital satellite using tethers to prolong orbital period before failure
- Engineering onboard code in C to perform real-time detumbling procedure post deployment using custom linear quadratic regulator control algorithm
- Solving ongoing difficulties with attitude determination and control mid-orbit using reaction wheels and Triad method

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: Altium PCB Designer, LTSpice, KiCAD, Autodesk Inventor, Autodesk Eagle, Solidworks

Projects

Dead Reckoning (https://github.com/KingArthurZ3/Dead-Reckoning)   *May - September 2019*
- A distributed embedded system that deploys sensor fusion algorithms for performing attitude determination on inertial measurement units (IMUs) and position state estimation with Kalman Filters; built for STM32 ARM-based microcontroller and completely written in C
- Controls three microcontrollers and IMUs in parallel with custom written clock synchronization and Byzantine Generals algorithm to support triple fault redundancy

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 and Javascript with Tensorflow and Vue.js frameworks
- Automated hyperparameter tuning on Random Forest, XGBoost, and Convolutional ML models; Developed web parser to scrape numeric financial data and automatically retrain ML models