Liu(Zuguang Liu)

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Embedded Software Engineer at Caterpillar, Inc.

EDUCATION

M.S. Electrical Engineering, Bradley University, USA — August 2023 - Dec 2024
Specialize in Robotics and Mechatronics — GPA 4.0/4.0

B.S. Electrical Engineering, University of Cincinnati, USA — August 2016 - May 2021
Mathematics and Embedded Systems minor, University Honors Program — GPA 3.9/4.0

EXPERIENCE

Core Machine Platform SDE — May 2024 - August 2024
L&T Technologies — *Peoria, IL*

- Developed and maintained automated simulation and testing tool for Caterpillar embedded software by extending Google Test framework with C/C++
- Developed and maintained user interactive simulation and testing tool as GUI application with Python and wx framework

Embedded Software Engineer — August 2021 - July 2023
L&T Technologies — *Peoria, IL*

- Verified and validated embedded software for Caterpillar's Medium Wheel Loader Transmission and Implements subsystems
- Maintained and developed automation framework for hardware- and software-in-the-loop testing with Python scripting
- Created wiki and training documentations for validation tools and methods

Electrical Engineer (R&D Co-op) — June - August 2019
Ethicon Endo-Surgery Inc. — *Blue Ash, OH*

- Designed and assembled an embedded PCB for a prototype product, developed firmware with UART control interface
- Built test fixtures for NFC sensing technologies, developed test scripts and created documentation

Automatic Assembly System Engineer (Co-op) — Jan - August 2018
Jergens Inc. — *Cleveland, OH*

- Designed and managed installation of an in-house grinder safety system with B&R Automation System (PLC)
- Design and programmed the HMI and backend control for the industrial system

SKILLS

Embedded Hardware	System design with MCU, interfacing mechatronic sensors, actuators and robot manipulators
Embedded Programming	HAL and RTOS programming on platforms including PIC, AVR, ARM (STM32) and RISC-V
Communication Interface	I2C, SPI, UART, Bluetooth, Zigbee, USB, Ethernet, CAN in signal and application layer
Circuit Design	Analog and digital circuit design, simulation, FPGA synthesis with VHDL and Verilog
Prototyping and Testing	On-board and PCB prototyping, developing test fixture and test automation scripts
Software Development	C/C++, Python, Git, Linux, Bash scripting, Tcl/Tk scripting, Qt, wx & GTK GUI framework

OTHER PROJECTS*

Collaborative Robots for Human-Robot Interaction Design, implement and validate control and navigation systems of Cobots from simulation to real environments (Master's thesis & alliance project with Caterpillar, Inc)

Pulmonary Acoustic Sensor Array Support the development of an IoT device capable of monitoring multiple channels of lung acoustics simultaneously and remotely diagnosing with machine learning (OSF Healthcare sponsored project)

Adaptive Video Streaming System For Remote Control Develop dynamic adaptive streaming system for teleoperations over unpredictable network conditions using state-of-the-art technologies (Caterpillar sponsored project)

Modular Garden Monitoring System An embedded system that autonomously manages garden environment with friendly UI, modular design and wireless communication (Senior Capstone Project)

Hyperloop Competition Participated in the development of the levitation pod for the carrier vehicle

* More projects and details can be found at `liu2g.github.io/projects`