Nicole Swierstra

Electrical Engineering Student, experienced in design, firmware, and software development of integrated circuits and systems.

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Relevant Skills

Embedded/Firmware programming: ARM/RISCV assembly, c (CMSIS, ChibiOS, FreeRTOS)
Application-side programming: c (Win32), c++ (QT, open-GL), c#, java, python
Design & Simulation: Altium, Fusion360, python, CATIA, SolidWorks, Excel

Education

Western Washington University (2022 -)

Projects & Applied Experience

Electronics Member, Formula SAE (fall 2023 -):

- V66 VCU OS — Developed a low latency control system for an electric car under heavy memory and processing restrictions with a simple custom real time OS. Critical safety checks and driver control were both able to be performed every 5ms, and the code itself had a very small memory footprint of around 940 bytes.
- V66 BMS Revitalization — Rerouted and reprogrammed our V66 car's Battery Management System, to get it working again after design and manufacturing errors lead to the loss of several lithium battery cells. The new design had much wider tolerances to protect against shorts, and the new code was much more efficient and readable than the old code.
- V67 VCU Design — Designed an Asymmetrical Linux/RTOS controller in Altium, using an already available NXP SoM to safe on manufacturing costs. Later revised it for the STM32H5 microcontroller, as it would be far simpler for other members to maintain.
- Autocross Lap Simulation — Began development of a python simulator that takes in vehicle parameters and gives an estimate on how well they would perform around an FSAE autocross track, using a LaGrange cost optimization.

Personal:

- V66 dashboard — Started as a part of the V66 car, turned into a project to validate and test my own PCB design.

More information on projects can be found in the portfolio page of my website

Employment

Development Intern, Autosport Labs (spring 2024 -)

Gained valuable experience programming in a professional production setting and learned workflows for managing collaborative projects in GitHub.

- Conversion Module — Wrote a python module that converts AIM, Motec, and Vbox files into Autosport Labs proprietary format.
- Other projects — Wrote firmware for a TBA product using Chibi-OS in c.