Embedded Systems Engineer: Nathan Care

(252)432-4054, Boone, North Carolina
carenathan027@gmail.com ◇ https://narwar04.github.io/ ◇ https://www.linkedin.com/in/nathancare/

Experience

Embedded/Electrical Lead

August 2022 - Present

Team Sunergy *Boone, North Carolina*

- Contributed as part of a 3-person team to develop a low-power data logger for a solar car, enabling real-time monitoring of the car's battery, solar array, and motors.
- Designed and implemented a robust CAN bus network to facilitate seamless communication between the data logger and the car's various systems.
- Led the design and development of the car's state machine, which dynamically controlled the activation and deactivation of different systems based on the car's current state.
- Collaborated within a 4-person team to design and develop the car's PCBs, including the microcontroller board, power distribution board, and telemetry board.
- Led the Electrical team, overseeing the design and implementation of all electrical systems in the car.
- Led the Embedded team, responsible for the design and implementation of the car's embedded systems, ensuring smooth integration and operation.

Projects

State Machine: I developed a state machine in C/C++ using an STM32 microcontroller as the core. The microcontroller was responsible for reading variables from various components of the car, including the MPPTs, BMS, and motor controllers, ensuring seamless integration and data flow throughout the system.

CAN Logger & Telemtry Recorder: In just two months, our three-person team developed a CAN bus logger and telemetry system. Using a Raspberry Pi with a CAN bus hat, my teammate and I were able to read data from the CAN bus. We created a user interface to display the data to the driver in real time. The data was transmitted via an XBee RF transceiver, which sent CAN frames to the pits, where we displayed the data on a webpage, visualizing it over time with graphs.

CS Home Assistant: Project Nebula was a custom-built Home Assistant designed for Computer Science students. Written in Python and backed by an SQL database, it stored questions from Stack Overflow and their corresponding responses, ensuring access even when offline. Nebula featured full text-to-speech and speech-to-text capabilities, along with fun and practical features like telling jokes and looking up word definitions.

Education

Bachelor of Science in Computer Science

August 2020 - May 2026

Appalachian State University *Boone, North Carolina*

- Was a member of the ASCII(Appalachian Society of Computer, Informatics, and Innovation)
- Was a member of the Robotics Club
- Was the Electrical/Embedded Lead of the Solar Vehicle Team
- placed 2nd in Hackathon

Skills

Programming Languages C/C++, Python, Java, JavaScript, HTML, CSS

Software CAD, KiCad, Visual Studio Code, Git, STM32CubeIDE,

Hardware STM32, Arduino, Raspberry Pi, ESP, PCB design

Protocols CAN, I2C, SPI, UART, LTE, RF

Tools Oscilloscope, Multimeter, Soldering Iron, Power Supply,