

Ethan Haengel

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Work Experience

NASA Software Engineering Contractor – SURA

Jan 2024 – Sep 2024

- Was invited to continue work from NASA OSTEM Internship as a contractor through the Southeastern Universities Research Association (SURA)
- Used Python to develop a multithreaded framework for data prioritization as a proof-of-concept for autonomous onboard decision-making
- Implemented multiple-criteria decision analysis (MCDA) to analyze incoming data from simulated agents for carbon spectroscopy, fire detection, and cloud cover to prioritize noteworthy and high quality data
- Optimized scoring and sorting algorithms to balance accuracy and processing speed
- Formatted framework as plugin for the OnAIR (On-board Artificial Intelligence Research) platform to simulate interaction with NASA's core Flight System
- Plugin was presented alongside other projects during the DSM project's final deliverables presentation, to demonstrate the benefit of the technology for future NASA missions

NASA OSTEM Intern – Goddard Space Flight Center

Jun 2023 – Aug 2023

- Worked with NASA engineers on the Distributed Systems Mission project to develop a machine learning model to detect anomalies in atmospheric spectroscopy data collected by the OCO-2 satellite
- Used Python to iterate on Keras anomaly detection model to optimize performance
- Converted anomaly detection model to TensorFlow Lite to simulate performance on embedded hardware
- Developed a basic visual demo using ROS 2 and Gazebo simulating usage in a real-world scenario
- Results and deliverables were compiled and presented at the end of the internship, and later at the end of the fiscal year to show the progress of the DSM team.

Education

University of Florida | Bachelor of Science in Computer Science

May 2024

Minor in Electrical Engineering, *cum laude*

GPA: 3.88/4.00

Noteworthy Coursework:

Integrated Products and Processes Design

Two-semester Python project as part of a 5-person team in collaboration with Verizon utilizing machine learning and computer vision on video recorded by drones to estimate the orientation of cell tower antennas. Followed engineering design process for planning and verification of design and had regular meetings and presentations to gather a variety of perspectives throughout the process.

Microprocessor Applications 1 & 2

A series of small projects on the AVR ATxmega128A1U microcontroller programmed in assembly and C, which covered topics including I/O, interrupts, PWM (Pulse Width Modulation), external bus interfaces, synchronous and asynchronous serial communication, and conversion between analog and digital signals. Later worked on a Tiva TM4C123GH6PM Microcontroller with several peripherals to gradually develop a real-time operating system (RTOS) and use that operating system to interface with sensors

Autonomous Robots

Project-based course studying several principles of software used in robotics, including simultaneous localization and mapping (SLAM), 3D transformations and kinematics, object detection algorithms, structure from motion (SfM), and Robot Operating System (ROS)

Machine Intelligence Lab

Part of large team developing an autonomous submarine utilizing Python and C++ to interface with vision systems, odometry, precise movement, and manipulators to complete an obstacle course for the annual RoboSub competition. Collaborated with team members to test and integrate drivers for doppler velocity log sensor, and implement conversion between USB and CAN signals.

Skills

Programming: Proficient: Python, C++, C, Java, Assembly
Familiar: SQL, C#, HTML, CSS, JavaScript

Environments: Linux (Ubuntu), Arduino, MATLAB

Miscellaneous: Microsoft Office products, Autodesk Inventor, SolidWorks, Soldering