Alex Perez

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EDUCATION

University of Florida – Gainesville, Florida
Bachelor of Science in Computer Engineering May 2023
Overall GPA: 3.98
Relevant Coursework: Data Structures, Digital Logic, Microprocessor Applications, Circuits, Computer Communications

WORK EXPERIENCE

Engineer Research and Development Center (ERDC) – Vicksburg, Mississippi
Computer Engineering Intern for Sensor Integration Branch Sept.2021 – Present

- Implemented ROS and Unity Engine to provide the ability to replay or livestream camera data through an Oculus Quest Virtual Reality Headset. This provided the ability to look around and perceive the environment from the perspective of the DamBot (autonomous vehicle used to construct 3D maps of its environment).
- Edited the RTAB-Map database user interface source code to allow the user to click on a node within the pose graph to display the images captured by the 5 cameras on the DamBot. This allowed members in the lab could sift through the images being captured by the cameras 10 times faster.

RESEARCH EXPERIENCE

Machine Intelligence Lab at University of Florida - Gainesville, Florida
Software Systems Lead for SubjuGator 8 and SubjuGator 9 (Autonomous Underwater Vehicle) Jan.2021 – Present

- Lead the simulation design of the new generation autonomous submarine through tools like ROS, C++, and Python.
- Collaborate with electrical and mechanical members of the lab to debug submarine peripherals such as cameras, passive sonar, and thrusters. One major task was the remapping of all the serial ports due to the usage of a new motherboard on Subjugator 8.
- Hold weekly office hours for approximately 20 active software members to visit and ask any task related questions. Some of the previous tasks included developing a new perception related mission, installing, and debugging a new passive sonar board along with its hydrophones, and allowing full duplex communication between two Raspberry Pis via acoustic modems.

Software Systems Lead for NaviGator (Autonomous Maritime System) Jan.2021 – Present

- Lead the simulation development for Virtual Robot X competition, which involves allowing the simulated vehicle to complete various tasks, such as station keeping, way finding, and perceiving images.
- Updated the boat's operating system from Ubuntu 16.04 to Ubuntu 18.04. Additionally, due to this update, many software tools and had to be updated to Ubuntu 18.04 compatible versions, such as the update from ROS Kinetic to ROS Melodic.
- Collaborate with electrical and mechanical members of the lab to debug the autonomous boat for lake testing. This has included the debugging of motors, which contained a hardware problem due to previous usage, and the GPS system, which contained outdated software packages from a sub-repository containing the code for the GPS system.

Undergraduate Research Assistant for Autonomous IndyCar Aug.2020 – Dec.2020

- Led the simulation design of the IndyCar through tools like ROS2, C++, and Python. Using URDF and XACRO files, the model was developed by considering properties such as the shapes, inertias, and joint mobility of the vehicle.
- Designed and implemented steering, braking, and throttle drivers for the lab's autonomous IndyCar. The steering and braking drivers used ROS2 to send intuitive values such as an angle or braking percentage into encoder count values that the smart motors use to move. The throttle driver used an Arduino Mega to control a servo motor that would pull a throttle string a specified distance.

COMMUNITY SERVICE

First Tech Challenge Team 3486 Mentor - Brandon, Mississippi Sept.2021 – Nov.2021

- Guided the usage of an IMU and PID controls to make the robot rotate at precise angles and drive straight autonomously.
- Attended meetings semiweekly to be available for any inquiries related to the implementation of sensors, motors, servos, and overall design.
- Answered any questions team members had related to high school, college, or life in general.

SKILLS

Software: C++, C, Python, ROS, Gazebo, MATLAB, Git, Linux, Java, Assembly

Hardware: Oscilloscope, Soldering Iron, Arduino UNO, Raspberry Pi 4, Atmel microcontroller

Soft Skills: Bilingual (English and Spanish)

HONORS & AWARDS

- Dean's List (4 Semesters)
- Florida Bright Futures Scholarship Recipient
- High School Valedictorian
- National FFA Parliamentary Procedure Champion
- Associate of Arts Degree (Summa Cum Laude)
- International Science and Engineering Fair Participant