Antonio I. Chappell

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Education

Current Senior | August 2021 - May 2025 | University of Oklahoma (OU)
- Major: Mechanical Engineering (BS)
- GPA: 4.0
- Sooner Competitive Robotics: Software Lead & Treasurer
- Engineer's club member

Work Experience

Software Engineering Intern | May 2024 - Aug 2024 | Devon Energy
- Automated the detection and association of remote field devices with radio tower network nodes using C# and PowerShell.
- Integrated this information with Devon's SCADA system through CygNet and AVEVA PI Asset Framework. Pulled networking information with the SolarWinds API. Created visualizations in PI Vision.

Automation Engineering Intern | May 2023 - Aug 2023 | Plow Technologies
- Wrote software for oil well diagnostics and state estimation. Estimated downhole dynamometer cards using surface card data. Downhole state was computed by solving a finite-difference representation of the wave equation for well dynamics in python.
- Created a firmware platform for remote read/ write of io over MQTT using JSON messages. Programmed in Arduino with demonstrations in python using OnPing parameters and HMIs. Designed an enclosure in Onshape CAD for the Adafruit Feather microcontroller.

Projects, Clubs and Collaboration

Sooner Competitive Robotics | January 2022 - Present | OU
- Overall: Our team for the Intelligent Ground Vehicle Competition (IGVC) won 1st place in Autonav during the summer of 2023 & 2024.
- C++ and ROS2:
    - Developed a particle filter for sensor fusion and localization of our IGVC 2024 robot. Wrote unit tests for the software using the Google Test framework for C++.
    - Implemented and tuned a PID for motor controller control and stability.
- Python & ROS2:
    - Implemented a CAN node for ROS to microcontroller communication
    - Implemented pure pursuit to navigate paths using our robot.
    - Researched and implemented tangent-based path planning.
    - Researched and tested a system ID process for the system dynamics of our robot.
- Fusion 360:
    - Designed and assembled PCB enclosures and attachments for our 2023 IGVC robot.
    - Designed and 3D printed propeller blades for an autonomous waterborne robot.
- Leadership
    - VP of Outreach: Presented at the OU AI Symposium in 2024 and 2023. Presented to high schoolers at Norman High about engineering & robotics at OU.
    - Software Lead: Onboarding and leading members on our software team in 2023 and 2024.

Model Steam Engine | December 2024
- SolidWorks: Designed a two cylinder steam engine assembly. Created motion studies for analysis. Currently working on material selection and manufacturing.

Linear Model Predictive Control for Battery Fast Charging | January 2024
- Used Matlab and Simulink to design and implement a model predictive controller for a linearized equivalent circuit model of a battery for fast charging.

Project Website | https://www.antoniochappell.net | August 2023
- Created a website for my projects, robotics, and internship experience using HTML, CSS, and JS.