

MICHIGAN STATE

UNIVERSITY

Beta Presentation

Test Platforms for Self-Driving Race Cars

The Capstone Experience

Team Michigan State University CSE SDRC

Andrew Nguyen

Jacob Youngerman

Ricardo Flores

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Spring 2025



*From Students...
...to Professionals*

Project Overview

- Allow testing of self-driving systems
- Control a 1:10 scale car
- Gather data while operating
- Display data on a local website



Team Member's Technical Tasks

Technical Tasks Assigned

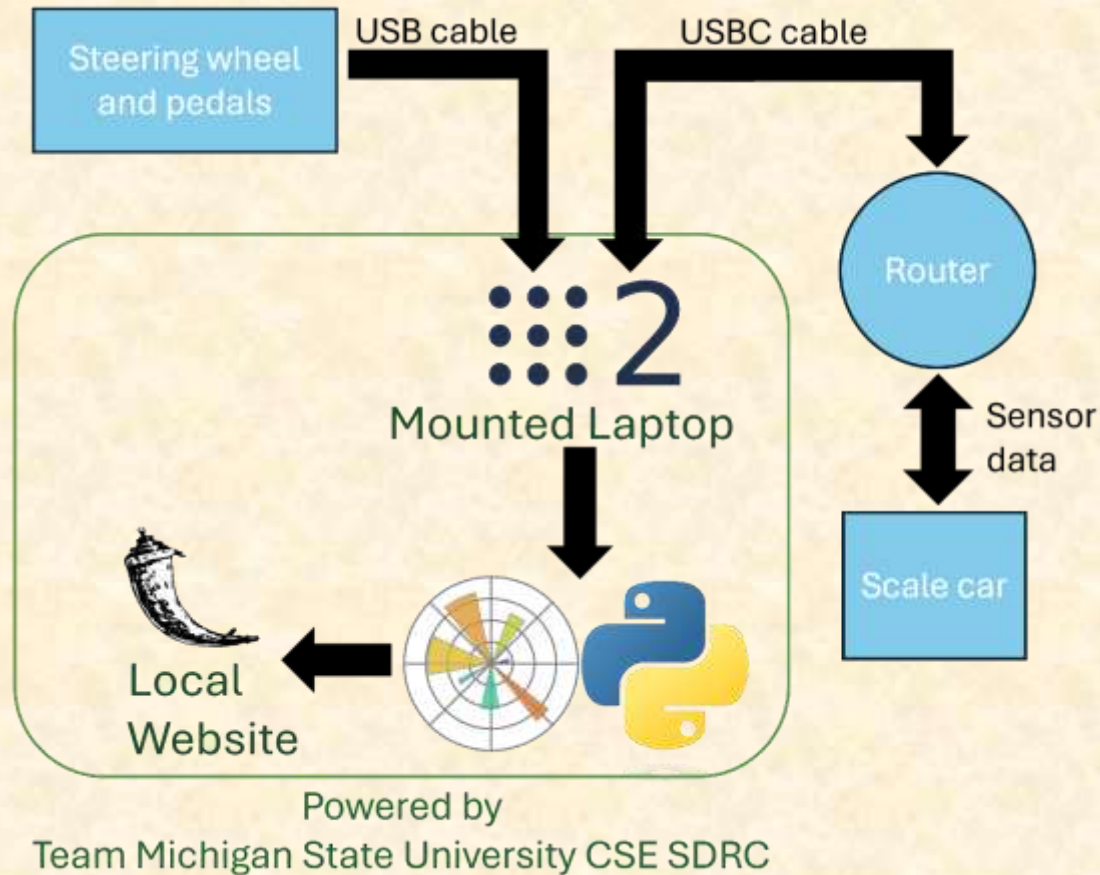
- Andrew Nguyen
 - Brake/Throttle telemetry for the website
 - Start/Stop button for all the website rosbridge commands
 - Swapping between the RGB and depth sensor camera modes
- Jacob Youngerman
 - Vehicle control via steering wheel and pedals
 - Hardware configuration and fixing various hardware issues with the Nvidia Jetson Orin and the VESC
 - Start/Stop button backend implementation
- Ricardo Flores
 - Base Local Website User Interface
 - File selection functionality for replay button
 - ROS2 Nodes and functionalities for RGB and depth cameras.
- Toby Wright
 - Loopback status, steering, and other stats on the website
 - ROS nodes to record data for storage on the laptop
 - 3D lidar node
- Vu Phi
 - Sensor configuration and initial code
 - Base ROS2 sensor nodes for IMU, Lidar and camera
 - Hardware configuration and hardware fixes, including the base station and the Jetson on the car
- Yuxuan Li
 - ROS2 Node for GNSS (GPS)
 - Functions to visualize the raw data from GNSS and IMU
 - Recording and replaying ongoing data flow from front end

Technical Tasks Completed

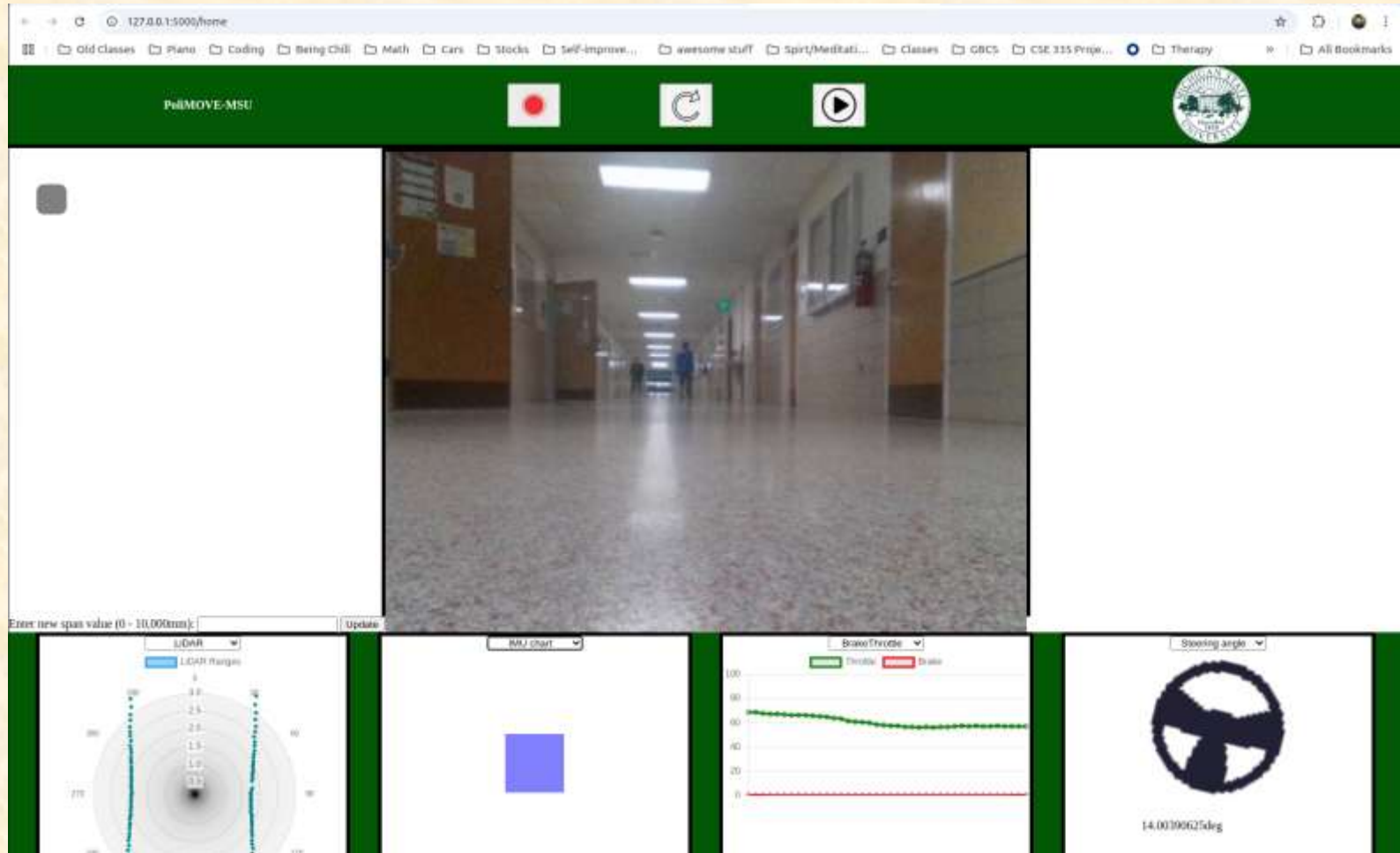
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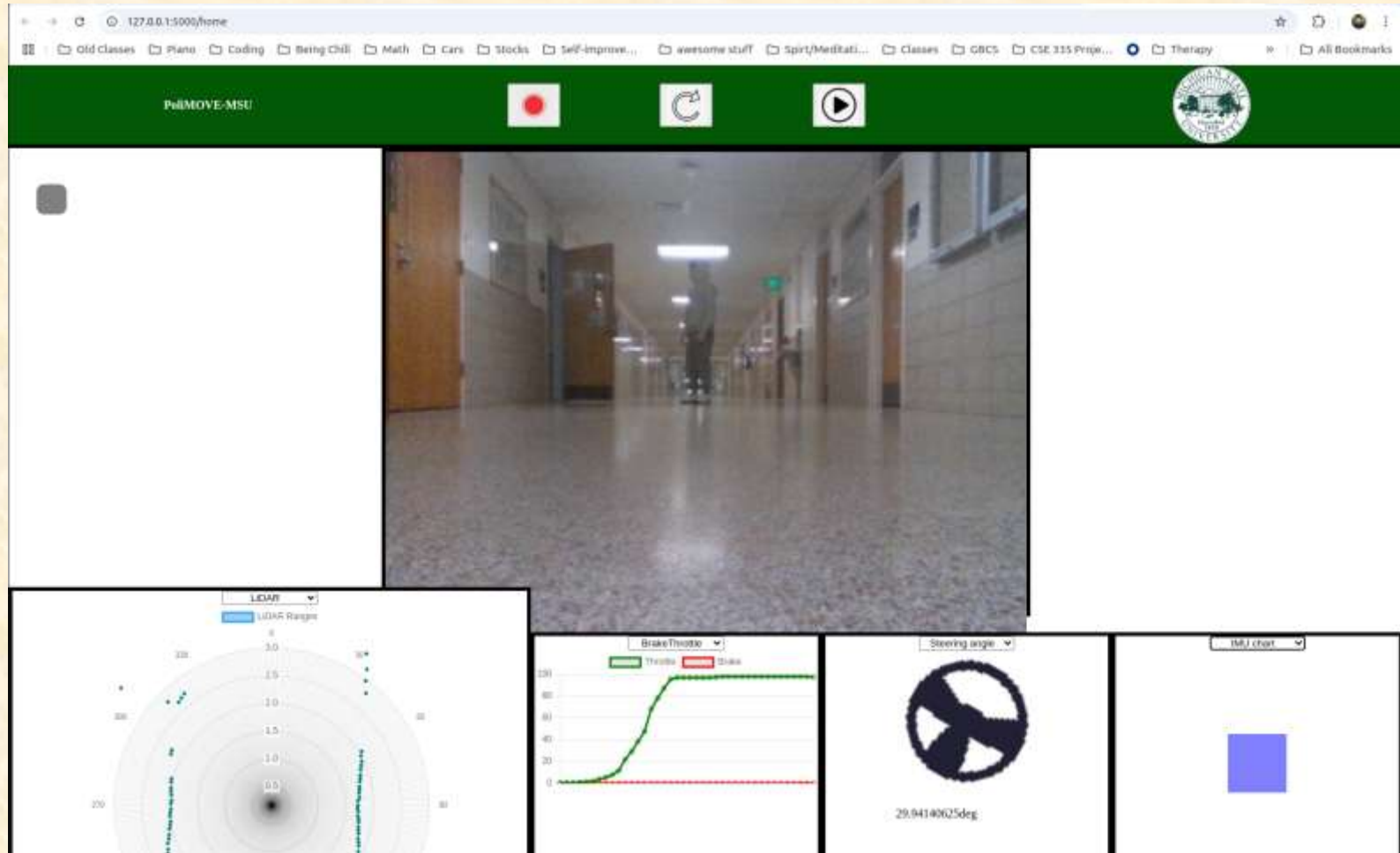
System Architecture



Website Layout (normal mode)



Website Layout (dropdown zoom)



Base Station



1:10th Scale Car



What's left to do?

- Features
- Stretch Goals
- Other Tasks
 - Modernize website UI
 - Testing
 - Clean up temporary files
 - Technical documentation

Questions?

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