Object Tracking Robot

EGR 314 Spring 2025:
Embedded Systems Design Project II

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Our Mission

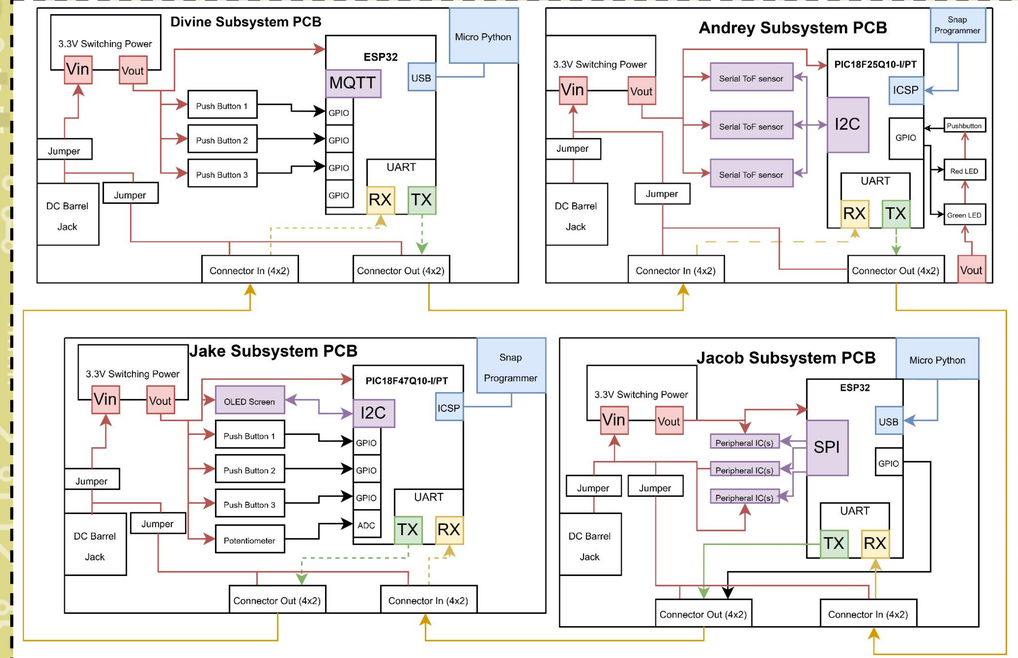
Our team is dedicated to develop **easy-to-maintain solutions** representing different **controllable processes and effects from mechanics** for use by students in **STEM-based classes** as a supportive tool for **interactive learning**

Our teamwork is centered around developing the devices that can provide **interaction with certain physical processes** related to solid and liquid body mechanics, supporting a well-defined **“control-feedback” loop**. As an important part of design process, we will also ensure that our products will be easy to setup and maintain by the sole effort of the end user

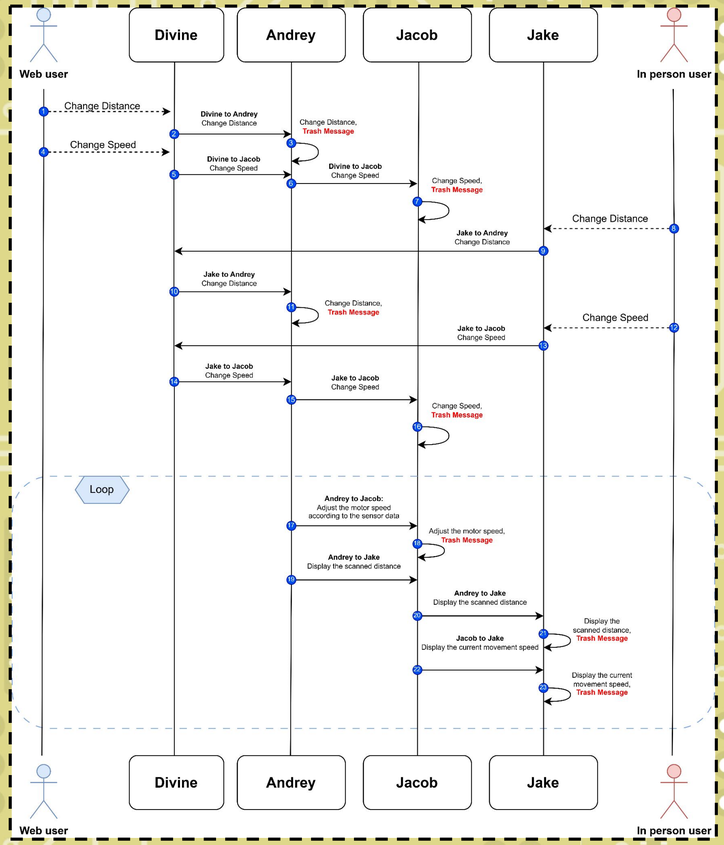
Our primary goal is to **develop a functional prototype of our device**, which we plan to showcase to peers, professors, and target audience at the Innovation Showcase

Our second goal is to maintain **high standards** for **documentation** throughout the semester and in future endeavors

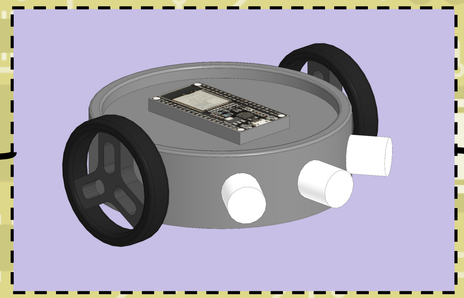
Third, we aim to **embrace a growth mindset** by learning from the mistakes we make along the way. **Mistakes are an inevitable part of any project**, and we believe it is crucial to analyze them to avoid repetition and continuously **improve ourselves**

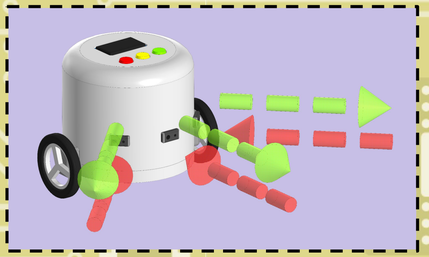


Communication Sequence Outline



Initial concept vs the final outline





Divine’s subsystem: MQTT System
Uses WIFI to connect to the device wirelessly

Andrey’s subsystem: Sensor System
Three distance sensors to detect how far away an object is

Jacob’s subsystem: Actuator System
Two motors to allow the device to drive around

Jake’s subsystem: HMI system
Human Machine Interface with buttons and dial for interactivity, and OLED screen for displaying info

The process diagram outlines the system's **data flow** and interaction between **subsystems**. Each module performs specific tasks—such as **sensor input, data processing, or motor control**—and communicates results to others through **UART**. This ensures coordinated operation across the whole system.

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