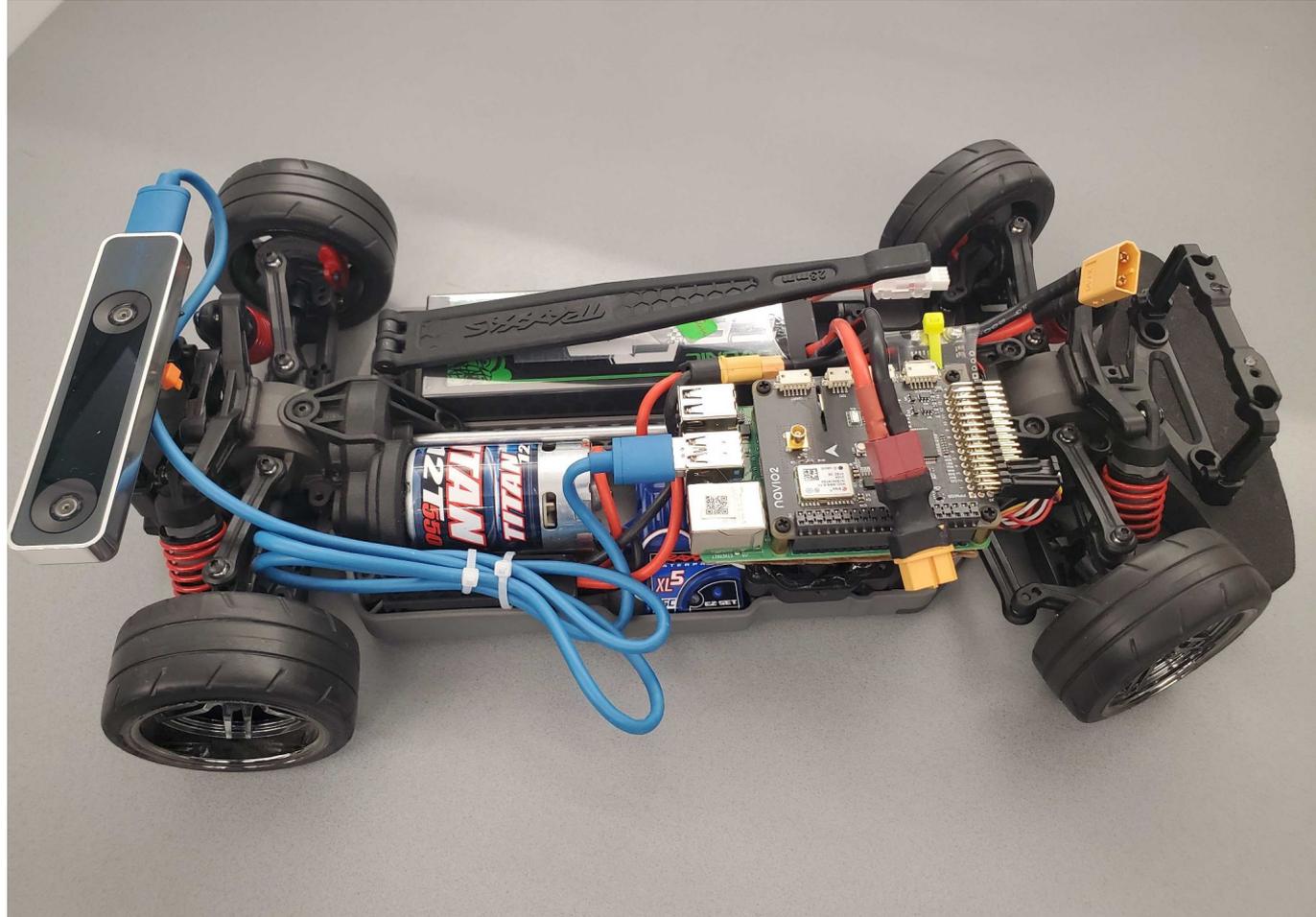# MP 4

CSCI 6907/3907 | Fall 2022 Term
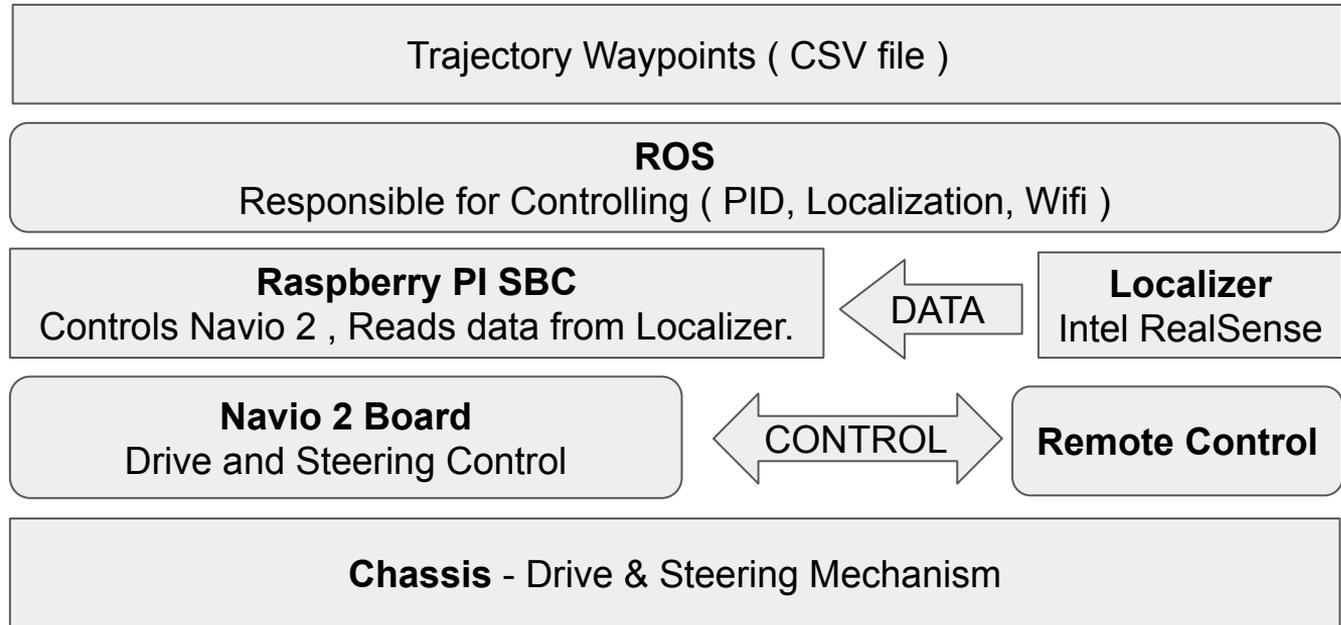
Objective

- Get accustomed to the hardware. (Rover)
- Launch an attack against the rover.

The Rover

Getting to know the hardware.

Trajectory Waypoints (CSV file)

ROS
Responsible for Controlling (PID, Localization, Wifi)

Raspberry PI SBC
Controls Navio 2 , Reads data from Localizer.

DATA

Localizer
Intel RealSense

Navio 2 Board
Drive and Steering Control

CONTROL

Remote Control

Chassis - Drive & Steering Mechanism

Accessing the rover.

- You'll be given terminal access to the rover's SBC. (Raspberry Pi, with root privileges.)
- You'll be given a radio controller to manually control the rover and switch between different trajectories. E.g. Square, Figure 8, Circle.

Attacking the ROVER

The Rover does few basic trajectories. E.g Square, Circle, and the Figure 8.

- **Creating new Trajectory:** Make a new Trajectory for the rover. The shape will be mentioned in the MP statement. *(Bonus points for mathematically proving that the rover can reach the points)*
- **Controller Attack:** Attack the Controller (PID) to make the rover Misbehave from a Certain trajectory. (Bonus points if you can make the rover make a different shape just by changing control parameters.)
- **Timing attack:** Make the Rover Misbehave by making it miss temporal deadlines.

Taking Care of the Rover

- The rover has Li-Polymer batteries which are dangerous if not handled properly. The instructions to take care of the batteries will be given in the MP. It is very Important that you follow these.
- There is a order by which the controls for the rover should be started and stopped.

Submission

- You'll be working in groups, each group will have access to the rover for a specific time window under the TA's supervision.
- Just show the TA that you've accomplished the objectives.