Roomba Swarm

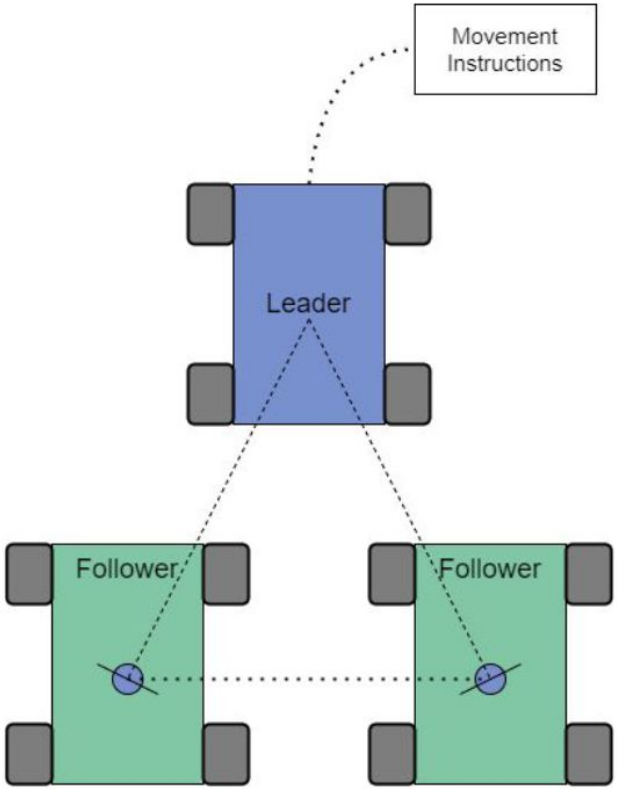
Team: sdmay22-02

Design Context - User Needs

Area	Description	Examples
Public health, safety, and welfare	Fire Rescue Drones	Increased ability to locate fire victims Carry/disperse fire retardants Can function if infrastructure is broken
Global, cultural, and social	National Defence Systems.	Could lead to different types of software in defensive drones
Environmental	Drones which can release fire-fighting chemicals	Increasing ability of drones used to tackle and/or prevent forest fires
Economic	Self Driving Cars	Ease of development of self driving cars could lead to lower costs

Prior Work

We inherited our project from a senior design group last year, they started this project by building a virtual simulation of the Robot flock using the design to the right.



Technical Complexity

Subsystems

- LIDAR
- Servo
- Cliff and Edge sensors
- Wall/Bump sensors

Design Decisions

Sensor Ideation:

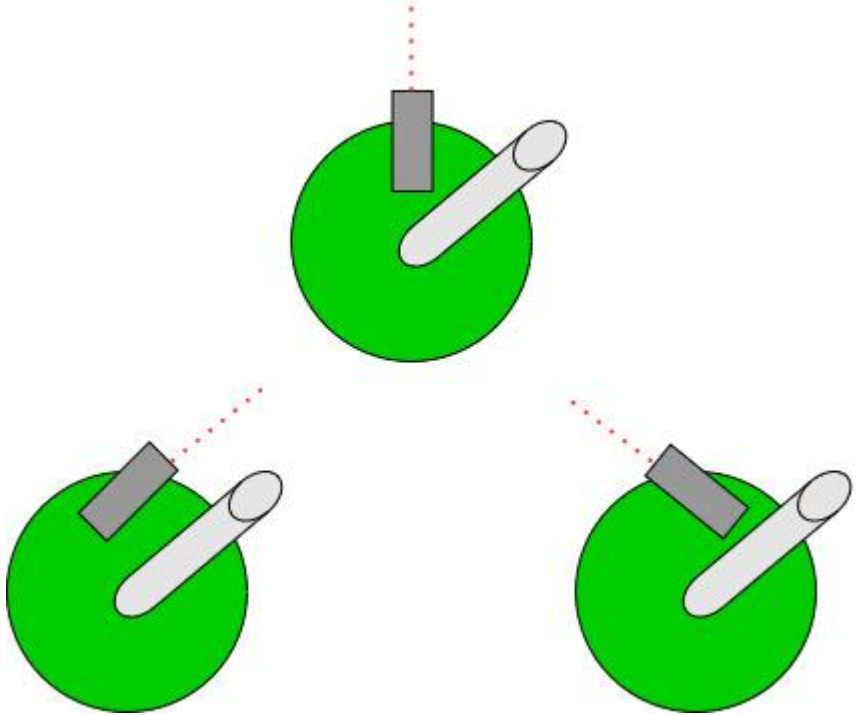
- Use previous project's proposed directional LIDAR
- Use standard CPRE 288 IR and Sonic Sensors
- Wi-Fi strength triangulation
- Camera and vision processing
- Omni-directional LIDAR sensor

Decision: Omni-directional LIDAR

Proposed Design

dark grey boxes = omni-directional LIDAR

Light grey cylinders = pvc pipe



Concerns

Working with new technology: OMNI-directional LIDAR,

- Inherited code developed for directional lidar, will have to modify more

Solution:

- Early testing
- Strong design to minimize software change