HIVE MIND
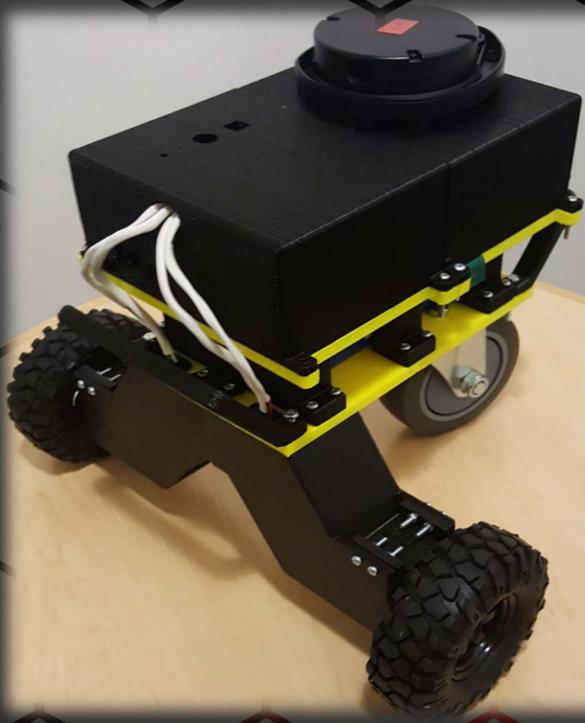

← Lidar

← Housing for Electronics

← Battery

← Sealed Motors

← Rubber High-Traction Tires

Objective:

- To develop a system of robots that can autonomously and efficiently sample a building for toxic gas levels
- Modular system to allow for various sensor types that will fit the customer's specific needs
- Some of the gases the system could sample include:
  - Oxygen (low levels)
  - Natural Gas (Methane, high levels)

Approach and Design Phases:

- Develop one robot (Bee-1) to navigate an environment while tethered to a PC
- Make Bee-1 autonomous (no user input required)
- Integrate information from Bee-1 into a dynamic display
- Enable a second Bee (Bee-2) that can share and receive information with the Bee-1
- Enable Bee-2 to search in conjunction with Bee-1
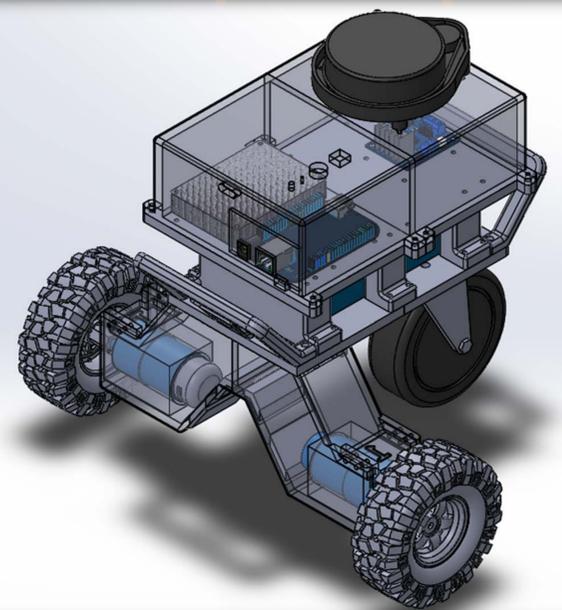
Flow Diagram of Process

- Bees will be placed near or in the entrance to the building

- Bees will separate and begin exploring the building while collecting data

- As the Bees collect data, they will relay the data back to the Hive to be stored and displayed

- The Hive will provide a UI for safety personnel to assess the situation in the building

Project Features:

- Navigates around obstacles autonomously
  - Uses Lidar (laser range finding) to see objects
  - Interprets information into useable data
  - Finds positions in space to move to based on the refined data
- Maps the environment
  - Combines information obtained from Lidar to create and update a visual and comprehensive map
  - Map displays navigational and atmospheric data
- Uses a depth first search algorithm

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