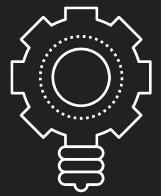
PoC Presentation and Demo

Company 2



LifeAutomation

AUTOMATE THE WAY YOU LIVE

Overview

- POC Video
- Technical Case
- Business Case
- Schedule and Plan for 440
- Self Reflection
- Test Plan
- Demo

POC Video

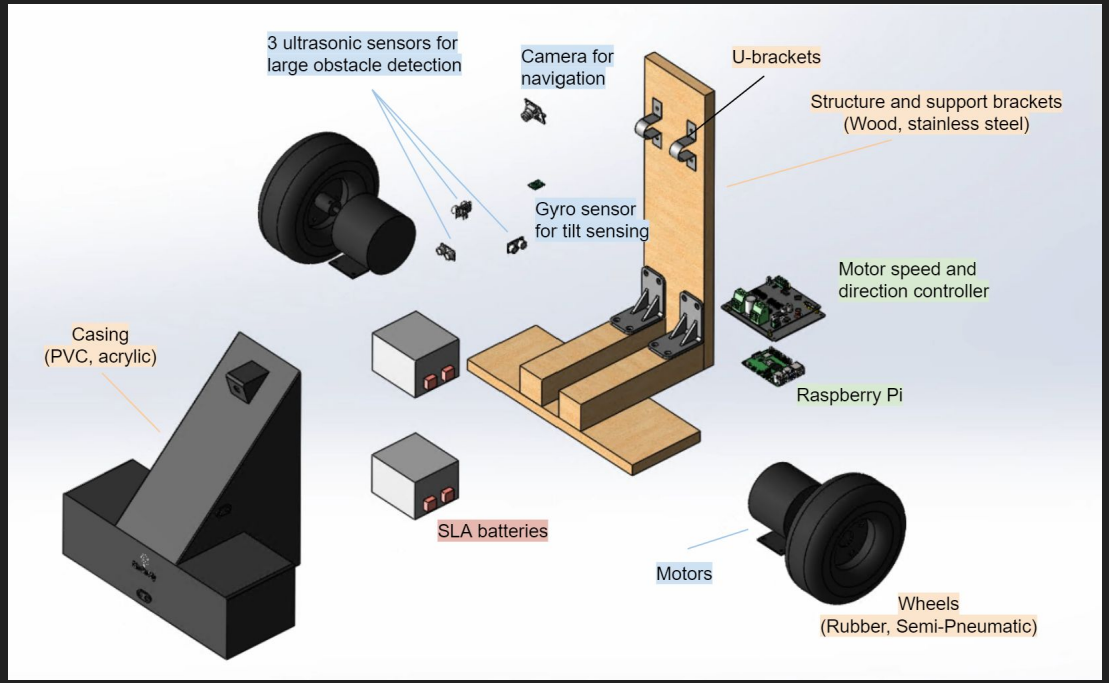
Technical Case

Main functions

- Mobility
- Navigation
- Tilt detection
- Obstacle detection
- App scheduling
- Battery powered

Project Modules and Materials

Structure and Casing
Sensors and Actuators
Computation and control
Power



Technical Case

Electrical

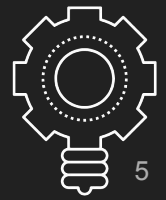
- CSA C22.2 No. 0.23-15 (R2020): General requirements for battery-powered appliances [1]

Safety

- CAN/CSA-C22.2 No. 94.2-07 (R2012) Enclosures for Electrical Equipment, Environmental Considerations [2]
- CAN/CSA-C22.2 No. 60529:16 Degrees of protection provided by enclosures (IP Code) [3]

Software

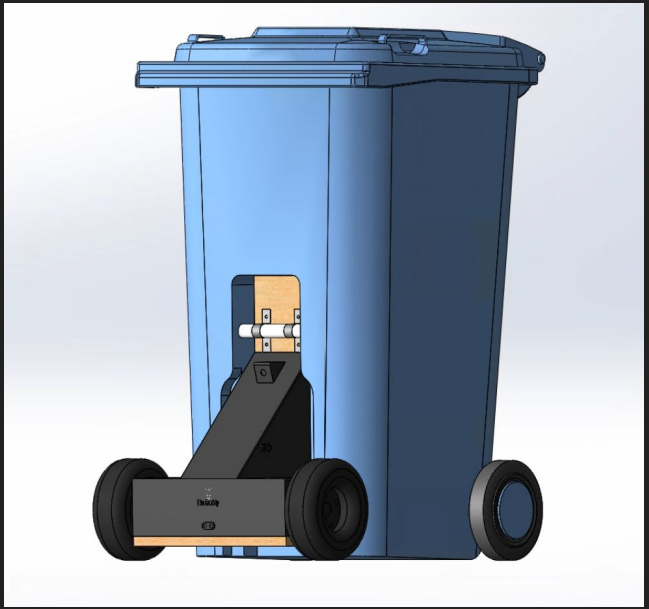
- IEEE 802.15.4-2003 - IEEE Standard for Telecommunications and Information Exchange Between Systems [4]



Technical Case

Changes in scope, design and functionality of PoC prototype

- Steering structure to improve turns
- User-friendly bin attachment system



Business Case

Ideal Customer

People living in standalone houses with simple driveways

Elderly/disabled people with accessibility needs

Considerations

Power consumption

Easy device calibration and assembly

Weatherproof

Prototype Development Cost

~$600

Funding

- ESSEF
- Wighton Fund

Expected Market Price

Base Cost: $300-500

Maintenance Cost: Charging batteries, potential replacement costs from wear and tear

Target Market

Lower Mainland

1,099,698 private dwellings [5]

senior population: 18% [6]

Business Case - Competitors

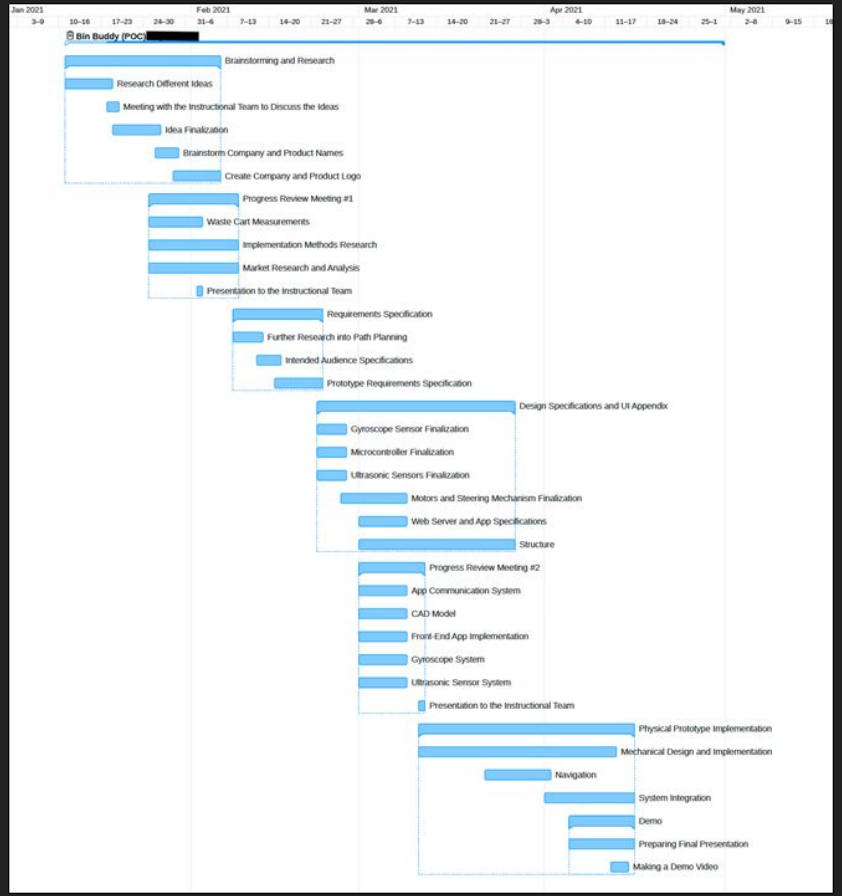
Rezzi SmartCan

- Compact design
- Good steering

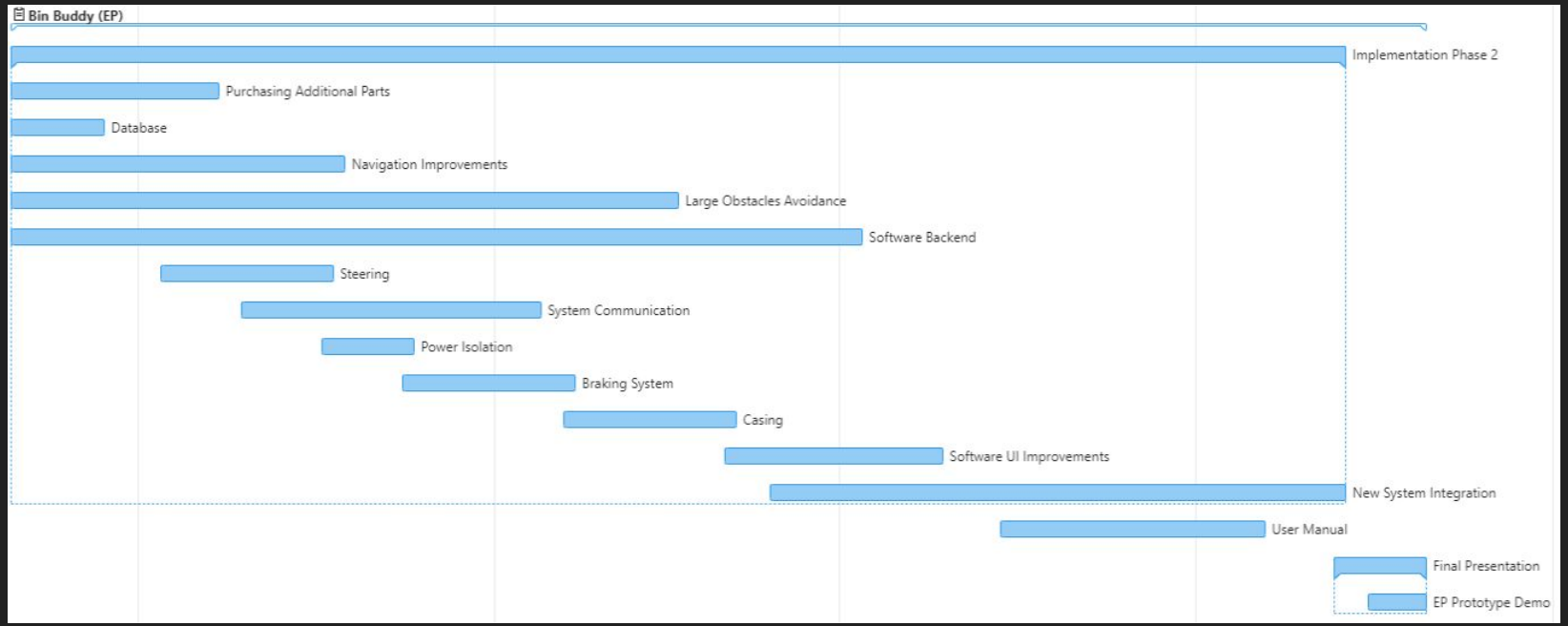
LifeAutomation BinBuddy

- More stable design
- Obstacle detection
- Bigger wheels can roll over small obstacles

Schedule to Date

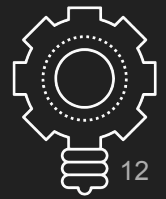


Plan for 440


Bin Buddy (EP)
Implementation Phase 2
Purchasing Additional Parts
Database
Navigation Improvements
Large Obstacles Avoidance
Software Backend
Steering
System Communication
Power Isolation
Braking System
Casing
Software UI Improvements
New System Integration
User Manual
Final Presentation
EP Prototype Demo

Self Reflection

What We Have Learned	Changes to Development Process
- Time management and having backup plans - Subsystem integration - Software, electronics, and hardware - Web Server/Websockets - Project documentation	- Start system integration as soon as possible - Purchase components early - Have efficient weekly team meetings with clearly defined goals and tasks

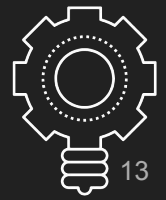


Test Plan

- System Communication
- Line Following
- Obstacle Detection
- Empty Cart Detection
- Load
- Stability
- Clamp
- Steering

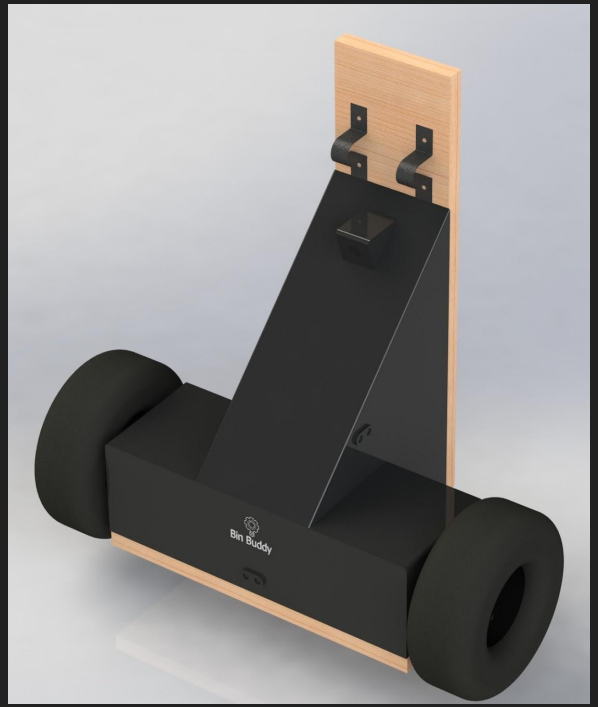
Test Name: Line Following	**Date:**
Test Description: Press “Start Bin Buddy” on the mobile application, ensuring there are no obstacles obstructing the expected path.	
Expected outcome: The Bin Buddy device will begin moving within 1 second and continue to follow the line provided.	
Actual Outcome:	

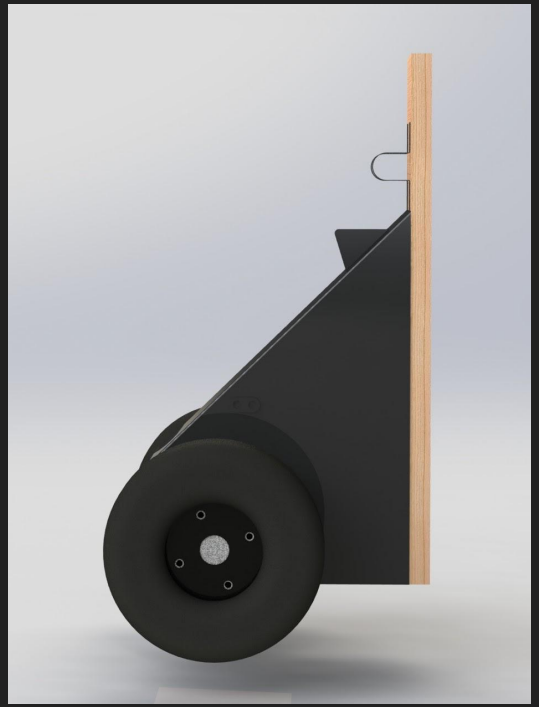
Test Name: Stability - Obstacles	**Date:**
Test Description: Place multiple small obstacles along the expected path, then press “Start Bin Buddy” on the mobile application.	
Expected outcome: The device should easily roll over small obstacles without tipping over.	
Actual Outcome:	



DEMO

Appearance Model





Mobile Application 

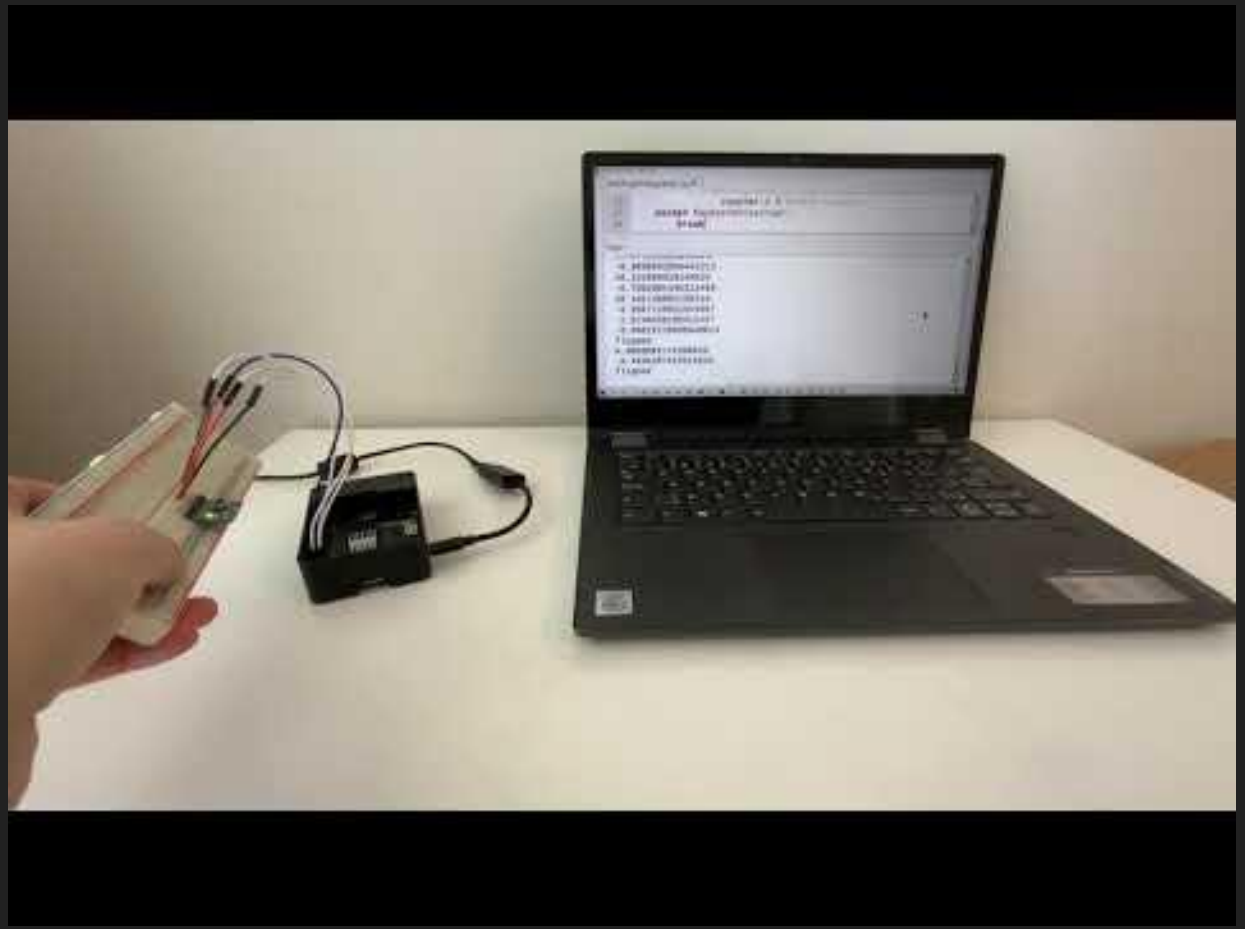
Mobile App Front End

Mobile App Back End

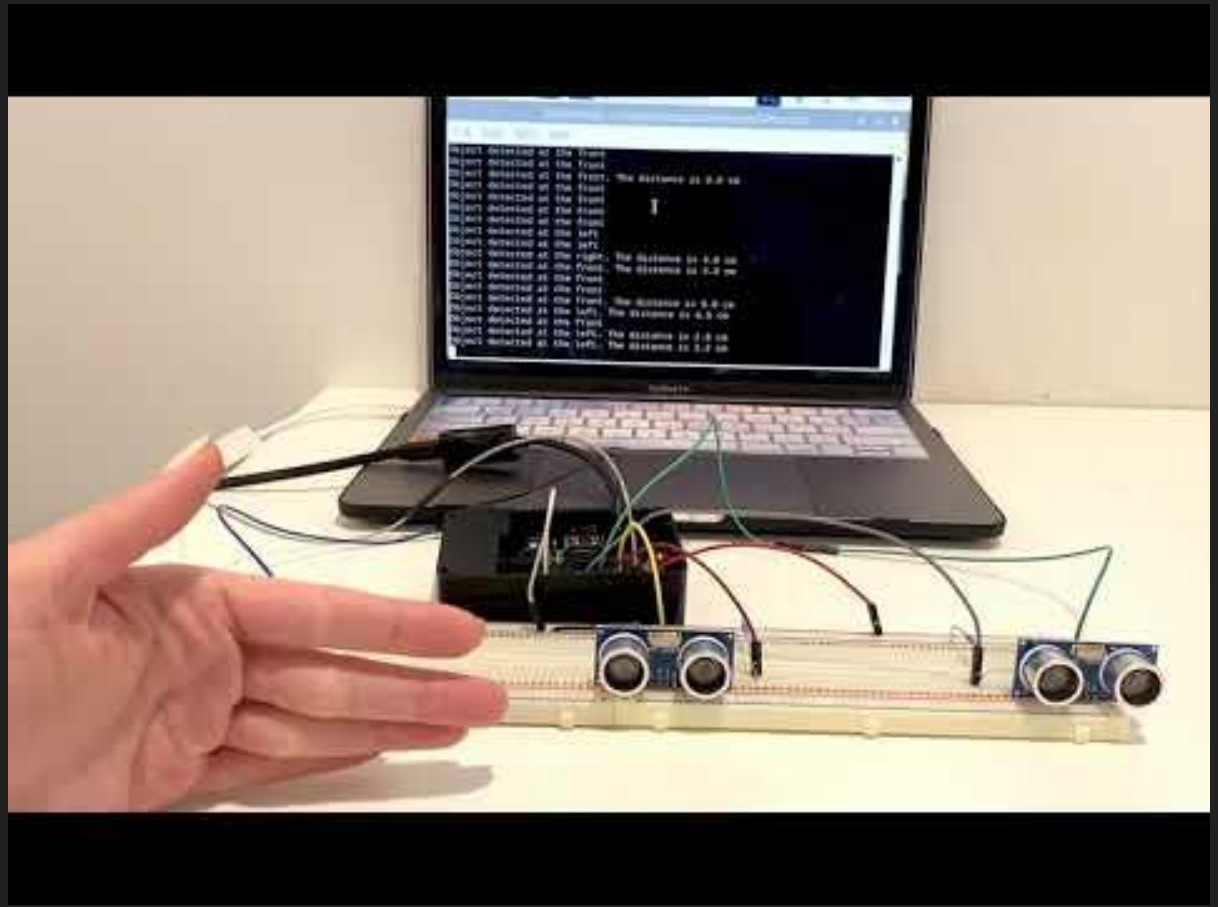
Mobility

Sensors 

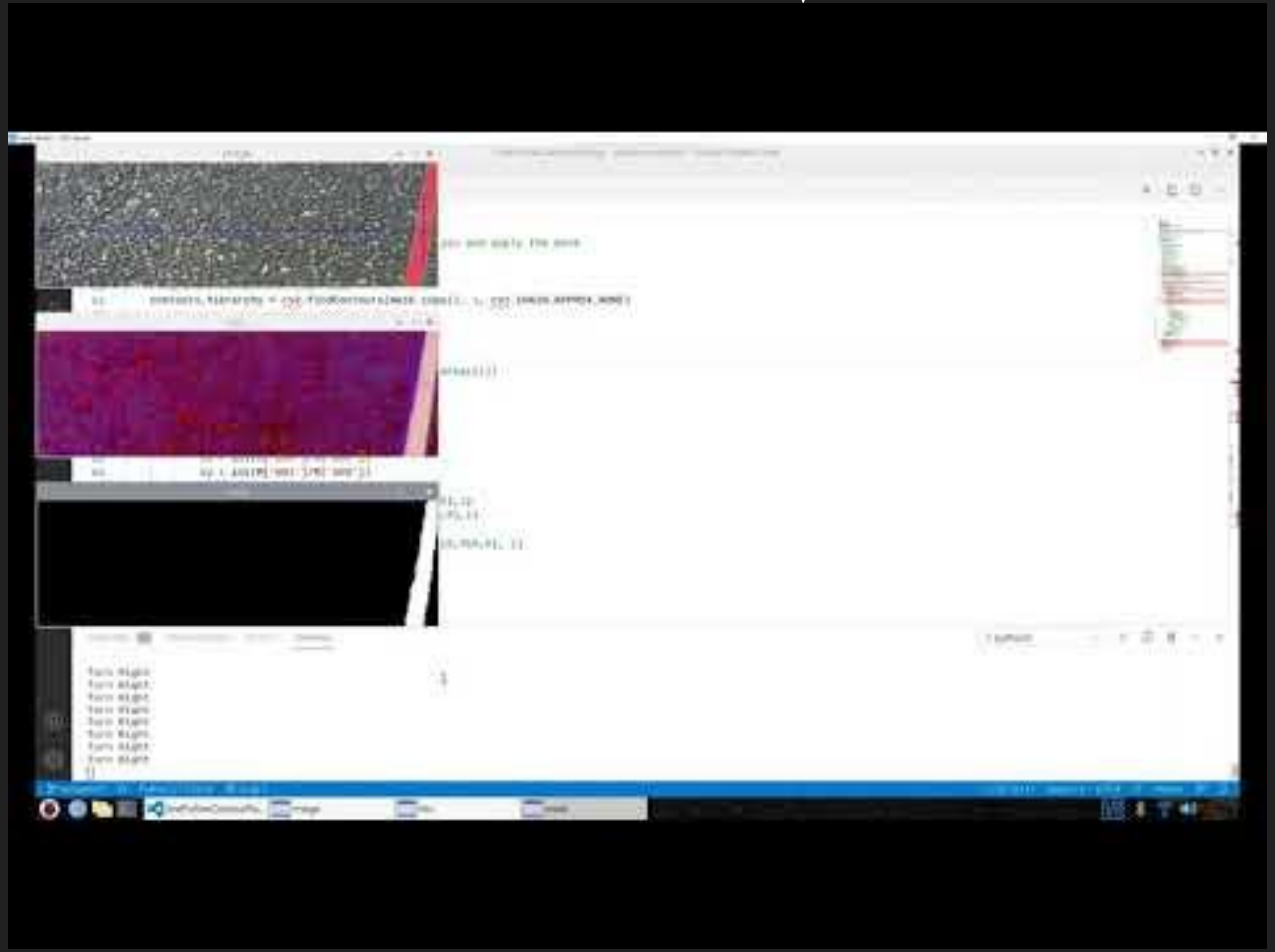
Empty Cart Detection



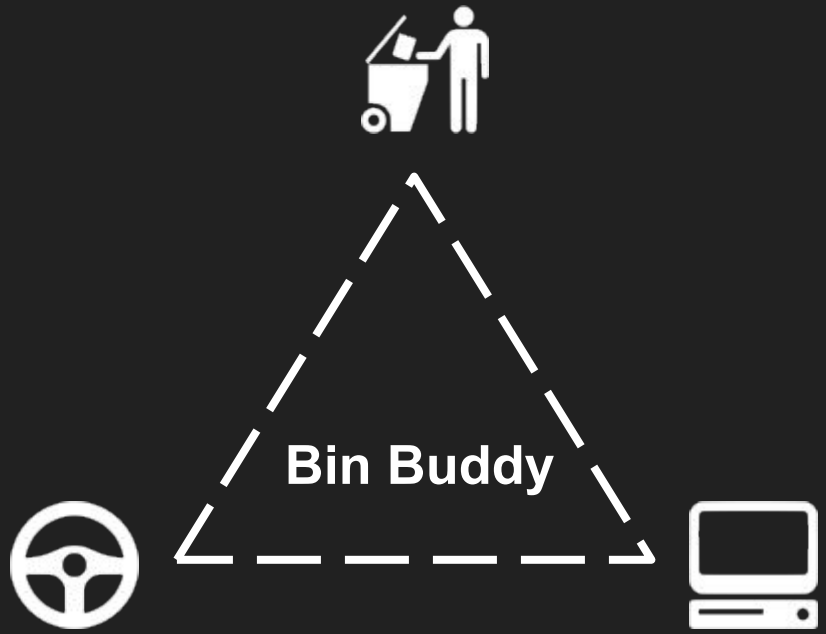
Obstacle Detection (Ultrasonic)



Navigation


turn right
turn right
turn right
turn right
turn right
turn right
turn right
turn right

Conclusion



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- Mike Hegedus
- Chris Hynes

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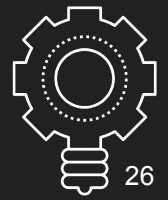
Questions?



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[2] "CAN/CSA-C22.2 No. 94.2-07 (R2012)," [Online]. Available: https://www.scc.ca/en/standardsdb/standards/23524. [Accessed 5 February 2021].

[3] "CAN/CSA-C22.2 No. 60529:16," [Online]. Available: https://www.scc.ca/en/standardsdb/standards/28497. [Accessed 5 February 2021].

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