



# TASK 0 - SYSTEM EXPLORATION

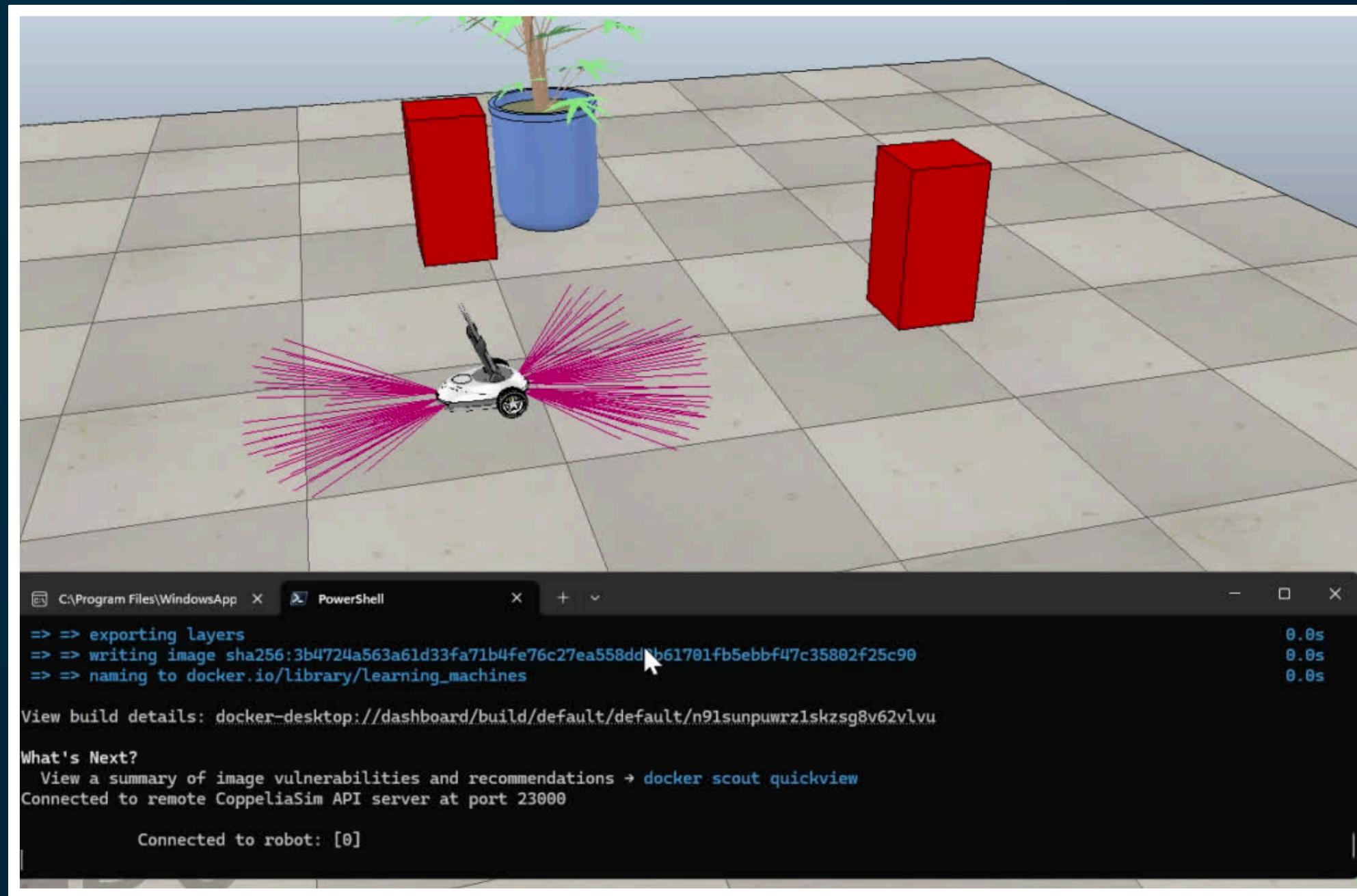
## LEARNING MACHINES Robobo

GROUP 14

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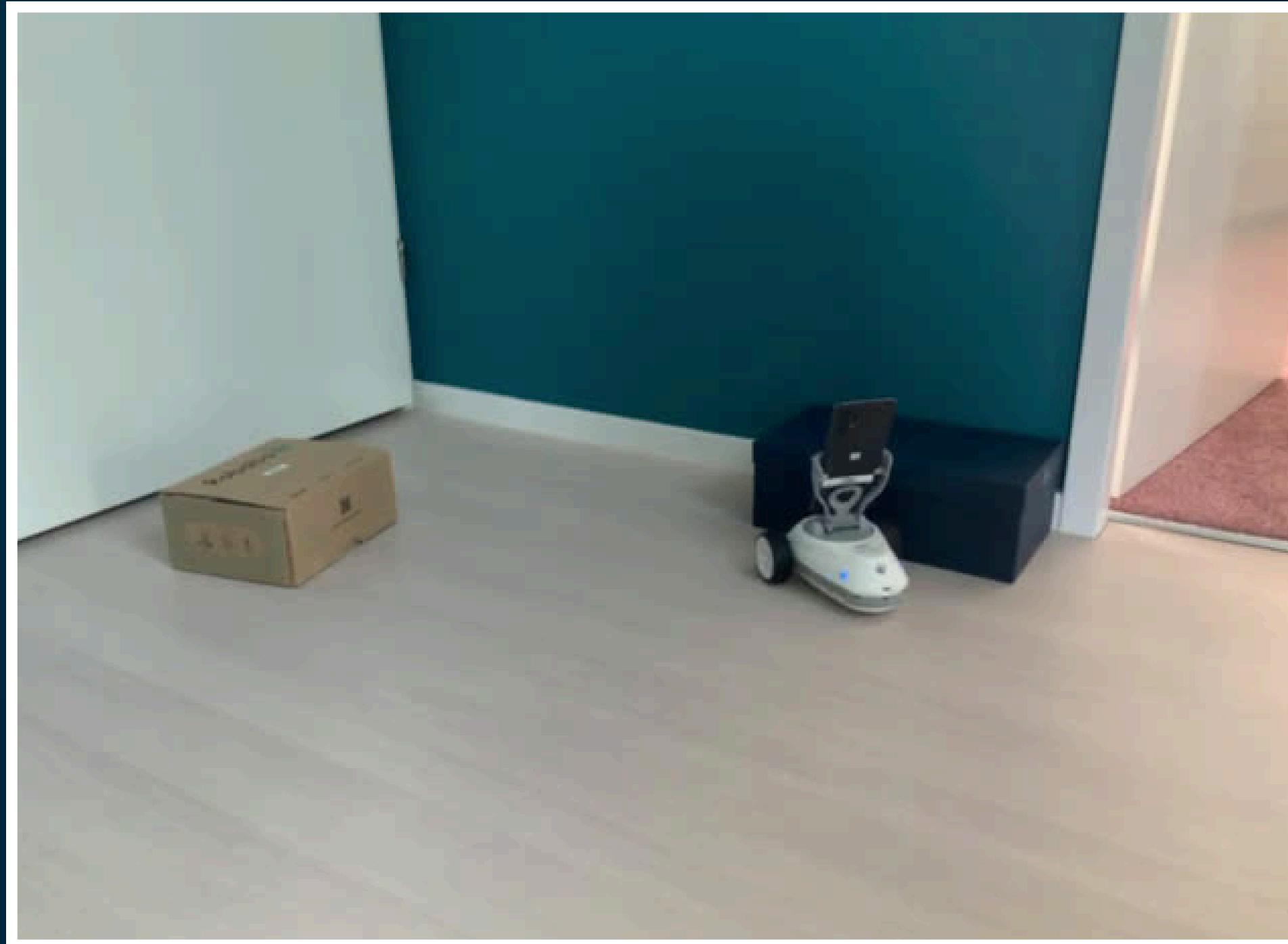
# SIMULATION DEMO

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# HARDWARE DEMO

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# PROBLEM & MOTIVATION

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- **Problem:** Comprehensive exploration and understanding of the system's architecture and functionalities.
- **Motivation:** Essential for successfully executing upcoming tasks and ensuring robust system performance.



# METHODOLOGY

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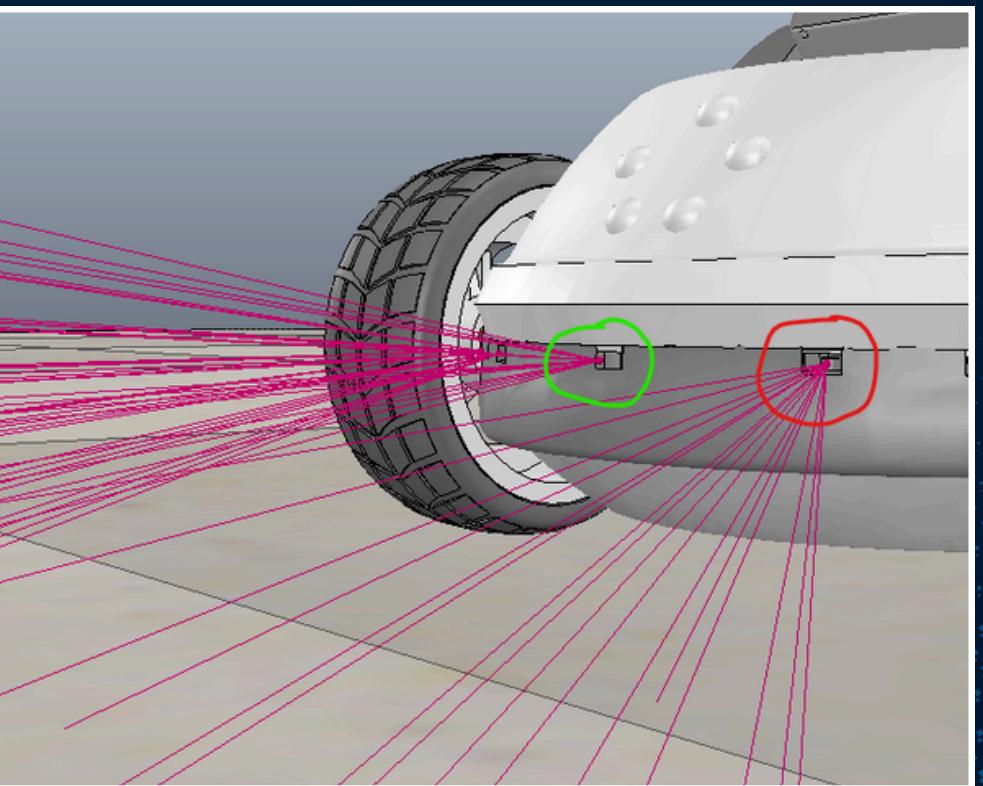
- Starting simulation.
- Moving forward until an object is detected by the front-central infrared (IR) sensor.
- If the sensor detects an object within a specified range (30 to 1500 units), it triggers the next set of actions:
  - Stops to prevent a collision.
  - Switch EMOTION to ‘Surprised’
  - Announces the detection with a phrase, “Oh, object detected!”.
  - Turns left with a speed of -50 for the left wheel and 50 for the right wheel over 800 ms.
  - Repeats this sequence of actions.
  - Communicates the total number of detections: “I detected X objects!”.
- Stopping simulation.



# EXPERIMENTAL SETUP

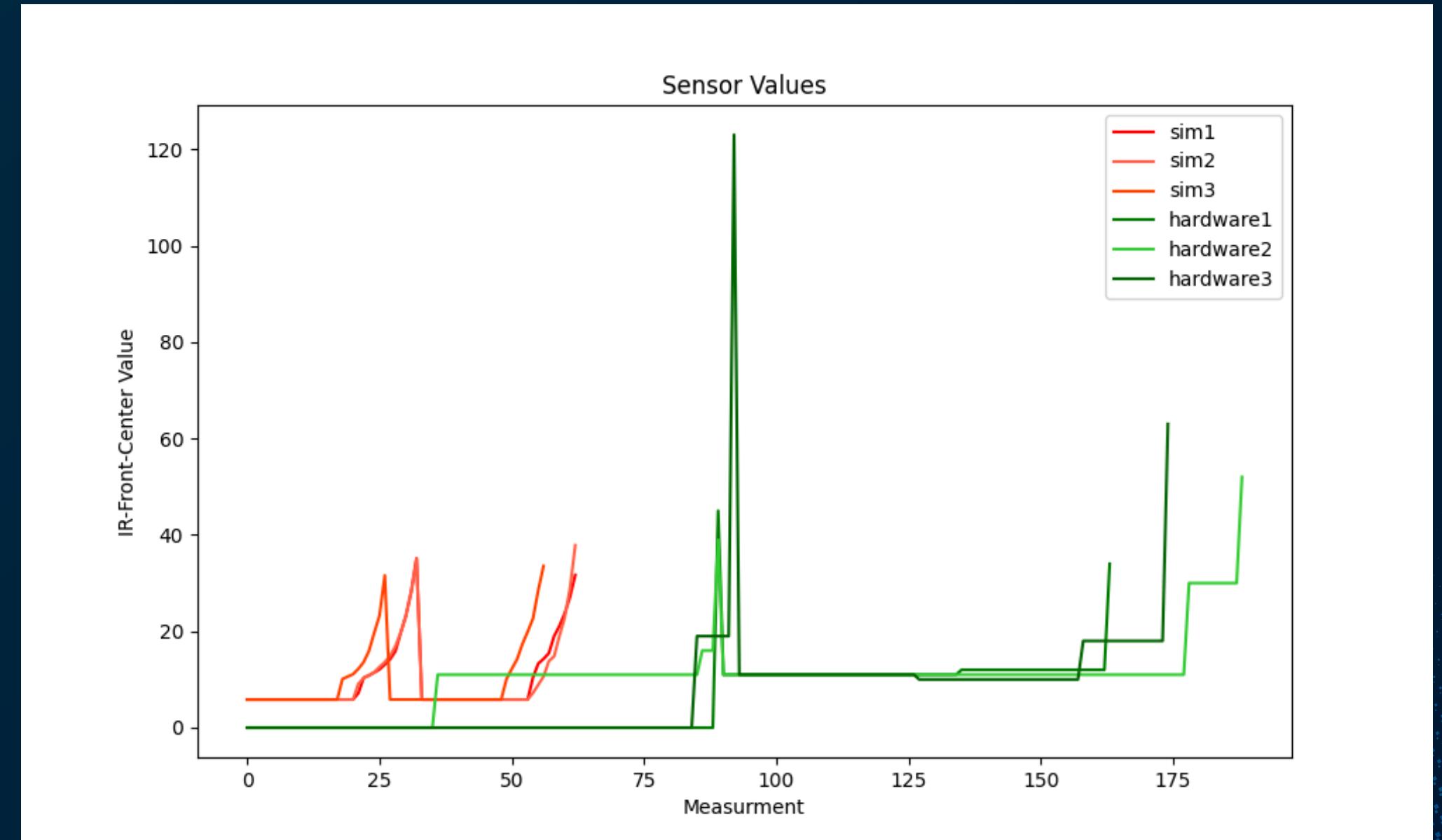
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- Installed the system using the tutorials on Canvas.
  - Explored various concepts before finalizing our chosen one.
  - The concept was developed using Python 3.8 on a Windows 10 platform.
  - Tested the concept three times, both in simulation and on actual hardware.
  - Plotted IR sensor values across time steps.
- **Challenges Encountered:** High sensitivity for Infrared (IR) Sensors.
- **Solution Implemented:** We used only the central front sensor.



# RESULTS

- **Hardware:**
  - Higher values
  - More measurements
  - Lower measurement frequency
- **Simulation:**
  - Controlled starting point
  - Less variability
- **Reality gap:**
  - Robobo collides with objects
  - Difficulty in managing and controlling the scene effectively



# CONCLUSIONS

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- Successfully installed the system and initiated simulations and hardware operations.
- Additional time required to fully understand the robot's functions.
- **Next Week's Goals:**
  - Gain a thorough understanding of the robot's algorithms.
  - Integrate standard functions to improve operational efficiency ('look-for-space', 'move-to', 'move-wheels', 'check-for-object').
  - Brains: algorithms, learning objectives, optimization/training.



# THANK YOU

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QUESTIONS ???

