MECHANICAL BOOTS

MIGUEL GUERRERO

OUTLINE

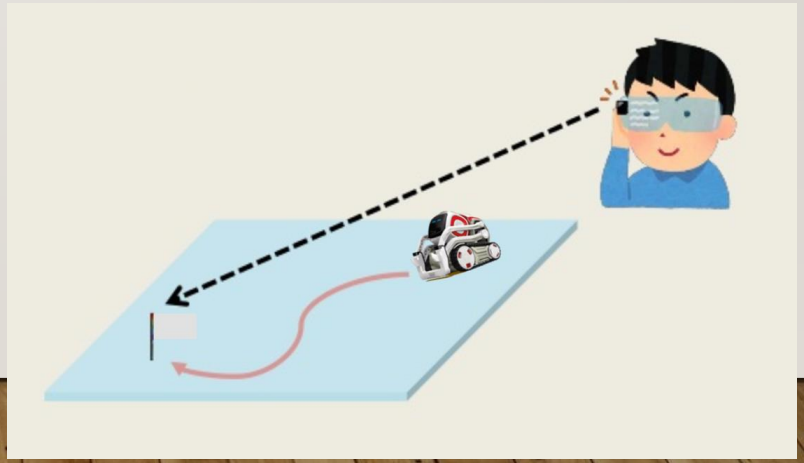
- Background
- The problem
- The solution
- Methods
- Results
- Going forward

BACKGROUND

- Ankis Cozmo is a AI-powerd robot with a personality that evolves the more you spent time with it. At its core it's a toy, but it has a well documented software development kit (SDK) that allows people to program the robot in Python.
- Microsoft HoloLens is an Augmented reality headset that allows the user to see the physical environment with 3D holographic models overlade.

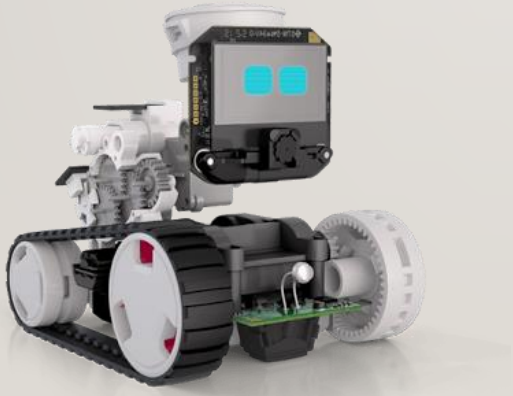
THE PROBLEM

- In the event of a natural disaster saving human lives is the first priority and robots could be used to assist these efforts.
- I want to be able to determine the practicality of reporting a communication from Cozmo to the headset. Successful results would be the worn hololens receiving live time and visual feedback from Cozmo for the user to be able to make decisions.



THE SOLUTION

- We can use the capabilities and the hardware of robots to better navigate the environment when it's too dangerous for living beings.
- Robots can serve as scouts, or boots on the ground, for pre and post environment disasters denoting hazards and safety concerns.



TOOLS

COZMO

- Cozmo SDK
- Python
- Laptop
- Smart phone
- Ubuntu
- ROS Melodic
- Docker

docker

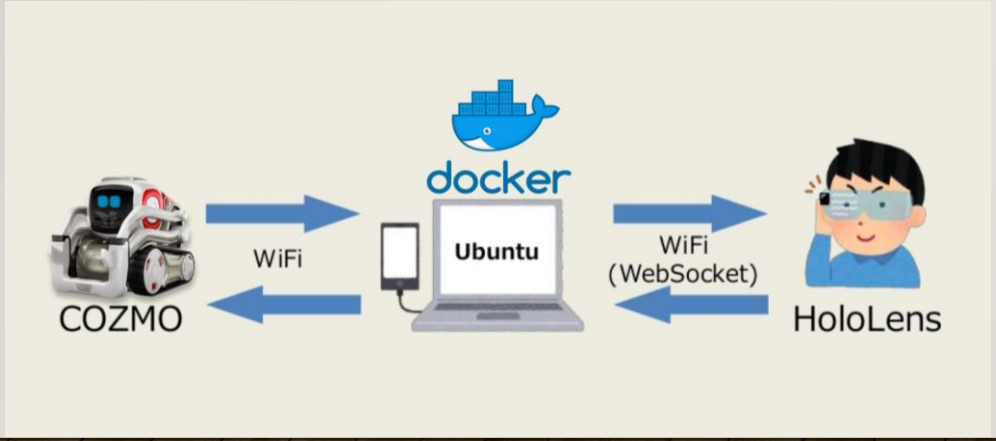
HOLOLENS

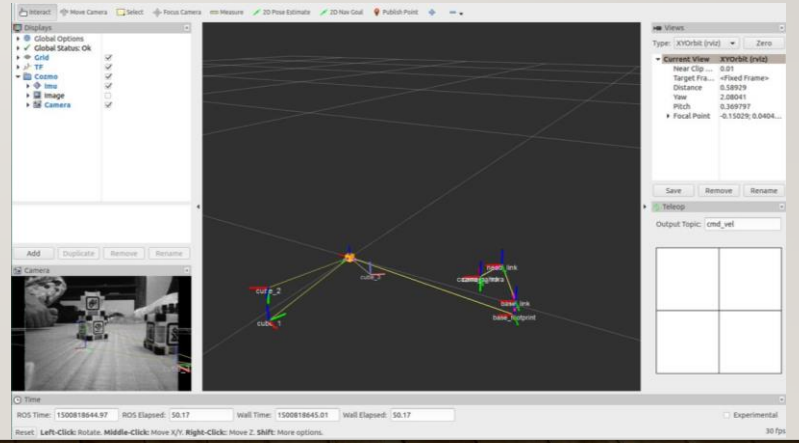
- WebSocket for Universal Windows Platform
- Unity

unity

METHODS

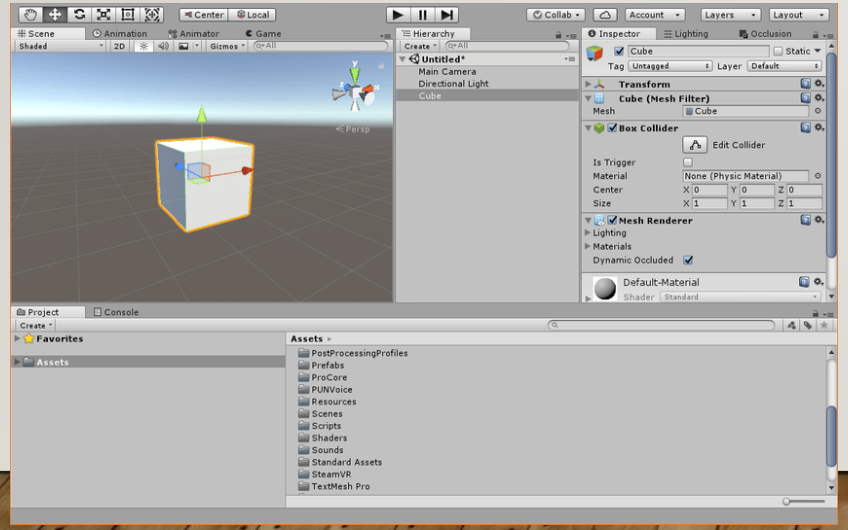
- To get the robot to "talk" to the HoloLens I need to use ROS. ROS is a middle ware that allows the user low-level device control, hardware abstraction, and much more. My use was to get the odometry of the robot to track it and overlay it on a virtual model and to establish a WebSocket connection. This is used in the event that I "lose" Cozmo. The virtual model of Cozmo will still be seen even though I can not see him physically.

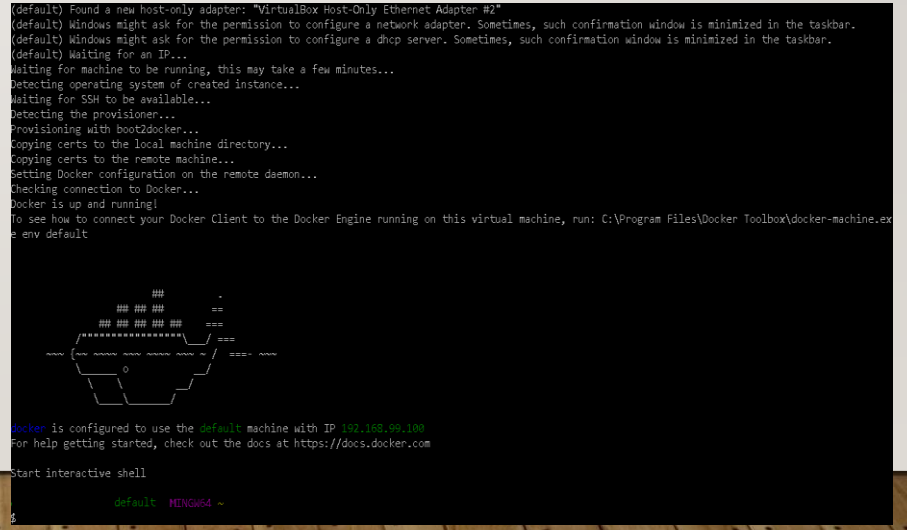




RESULTS

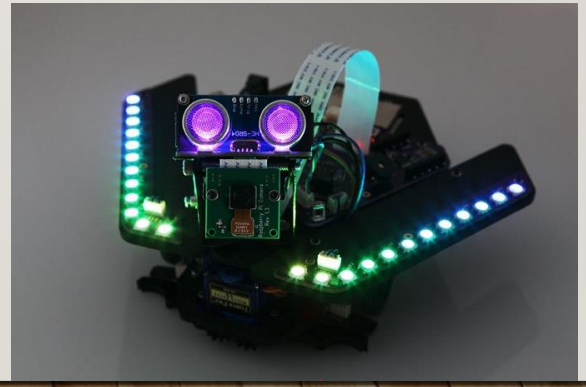
- This project is still in progress. I was able to connect the HoloLens with Unity and display a cube.
- Getting Cozmo to work with ROS was a challenge. But I am now using Docker to facilitate the connection.





GOING FORWARD

- I would like to complete this project and get all the pieces to work together.
- I want to move away from Cozmo and the HoloLens and focus on building my own robot and using Virtual reality rater then Augmented reality.
- The reason for my own robot is to have more control over the hardware and improve when needed.



QUESTIONS?