Handheld AR Device

Group 09

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- Paperwork and Paper Formatting

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- Tasks completed: Aruco Marker recognition and homography

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- Configured camera with the raspberry pi to enable video capture

Project Partner - Dr. Joseph Louis

- Professor at OSU
  - Teaches Civil Engineering

- Stakeholders would be Construction companies

Project Partner's Goals

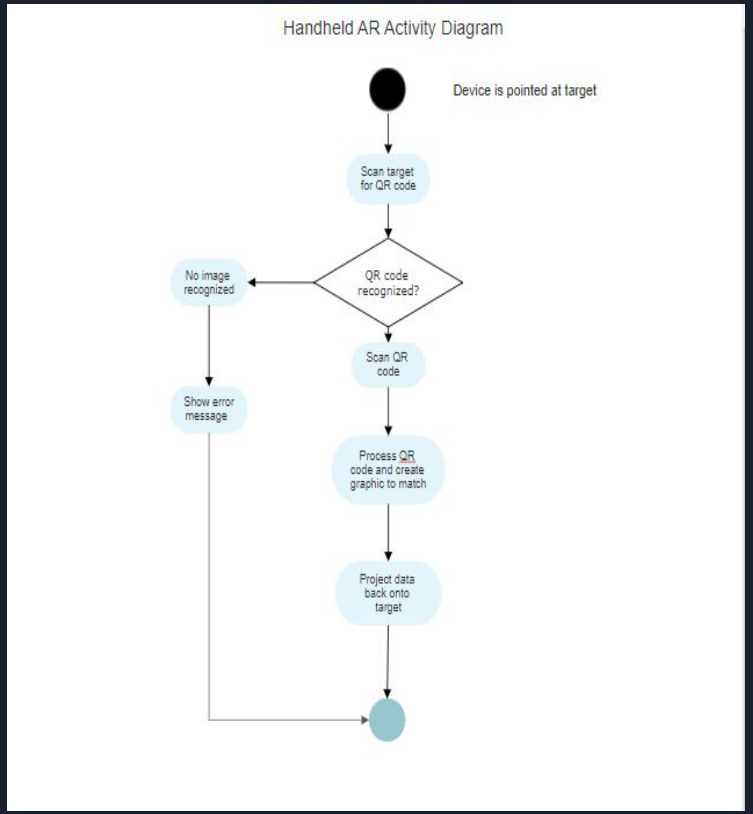
- Use the Raspberry Pi Camera Module to take in visual input
- Use OpenCV and Raspberry Pi to find AR Markers in the visual input
- Use the AR markers to find the orientation of the camera
- Project a 3D object is a set location relative to the AR marker

Project Overview

- Develop AR device that is able to
  - Take in visual input through a camera
  - Use OpenCV with the visual input to recognize what is being seen
    - We are using OpenCV ArUco markers as input to detect what we are trying to create
  - Find relevant data corresponding with what is being seen
  - Display new graphics over the existing images to represent that data.

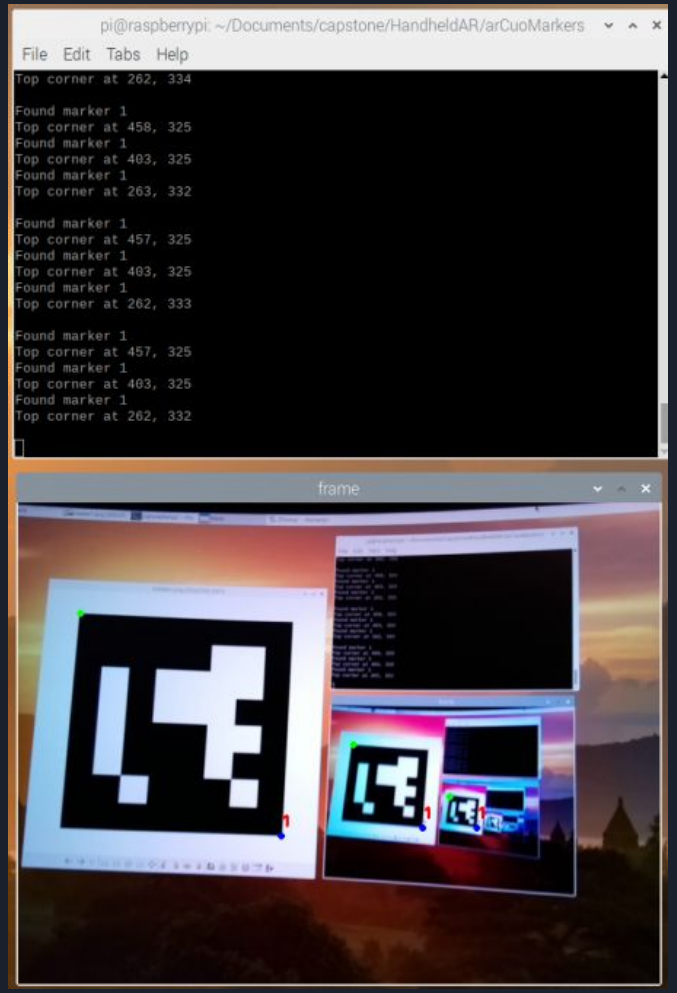
Process Diagram

As we've progressed in this project we have realized we will not be able to get to a point where we can project the graphic back out. This process diagram can still be followed with the only difference being that our image will digitally placed in the environment instead of actually projected.



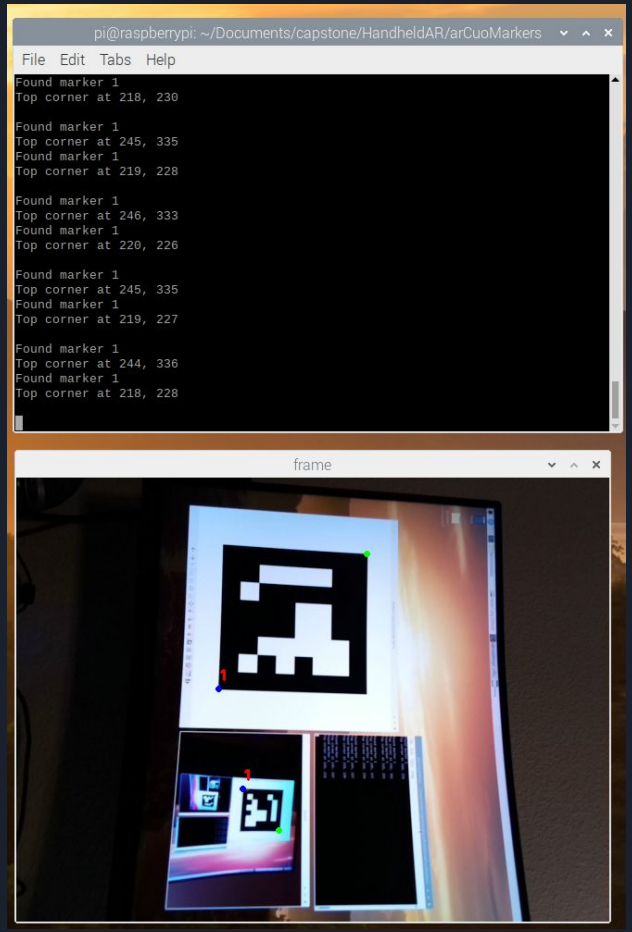
Demo Pt. 1

This image shows the AR marker being correctly identified (multiple times) during a live recording. When the marker is found, the program has drawn a green dot in the top left corner and the AR marker's index number on the bottom right.



Demo Pt. 2 - Homography

The rotated image shows the green and blue dots still mark the same corners.



What is Left?

- Improving the accuracy of reading AR markers
- Create graphics that are positioned relative to AR markers and defined by AR marker index.

- Change in Scope: No more projector