

A decorative graphic on the left side of the slide. It consists of a blue parallelogram and a light green parallelogram, both tilted at an angle. The blue shape is in the foreground, and the green shape is partially behind it. They are set against a dark blue background with faint, larger-scale geometric patterns.

April Bot

Group 9



Who we are

Adam Yaj

Junior

Computer Science

Alexander Wan

Sophomore

Electrical Engineering

Em Kramer

Senior

Computer Science



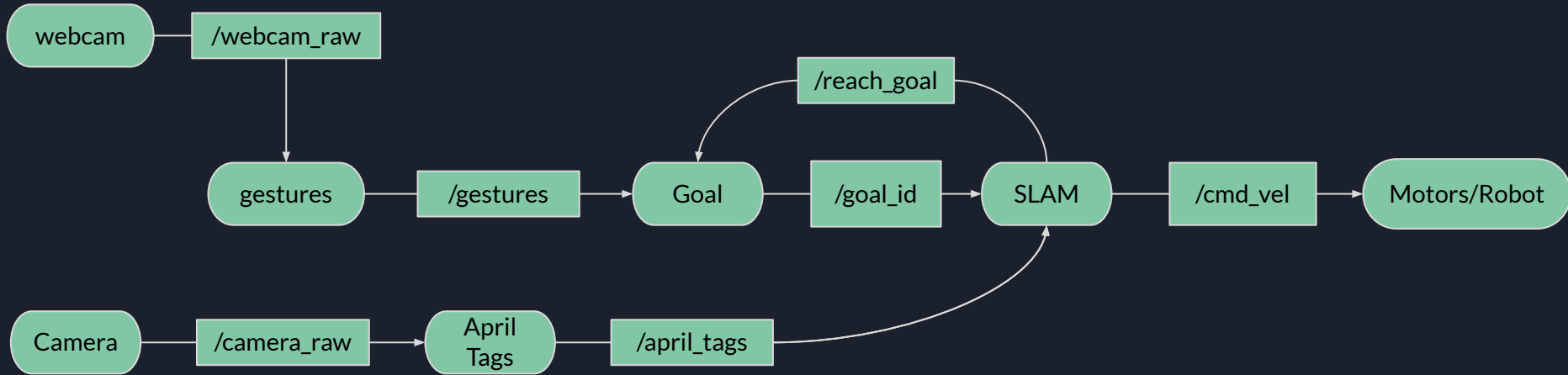
The Problem

Problem: Navigate a static environment to known landmarks when given commands through hand gestures.

Approach: Use April Tags to mark the known landmarks and use robot camera to see them. Use SLAM for localization and mapping. Use web camera to see hand gestures.

Relevance: Uses camera vision to both recognize gestures and see april tags in environment. Uses SLAM to navigate the environment.

ROS2 Systems Diagram





The Plan

Create communication and code repository resources. (Nov. 24)

Get base packages created on ROS2, installed on personal computers. (Nov. 26)

Get Gazebo world package to run a world, add april tags and obstacles. (Dec. 1)

Get hand gesture detection package detecting sign language for 1 through 10. (Dec. 1)

Get april tag detection package detecting april tag location, orientation, and ID. (Dec. 1)

Add robot package to world. (Dec. 3)

Make SLAM package for combining April Tag and LiDAR localization. (Dec. 5)

Finish the Goal package and add a cancel gesture. (Dec. 5)

Merge pull requests and resolve integration issues (Dec. 5)

Fully integrate whole system for a working project (Dec. 8)

Finish writing the full report (Dec. 18)



Division

Adam Yaj

Hand Gesture
Recognition

Integration

Alexander Wan

Creating Gazebo World
Package

Goal Package

Em Kramer

April Tag Detector

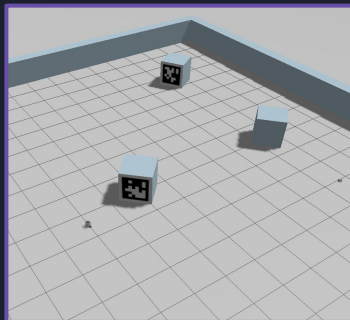
SLAM Navigator

Progress

Working Hand Gesture
Package

Goal Package
Implementation

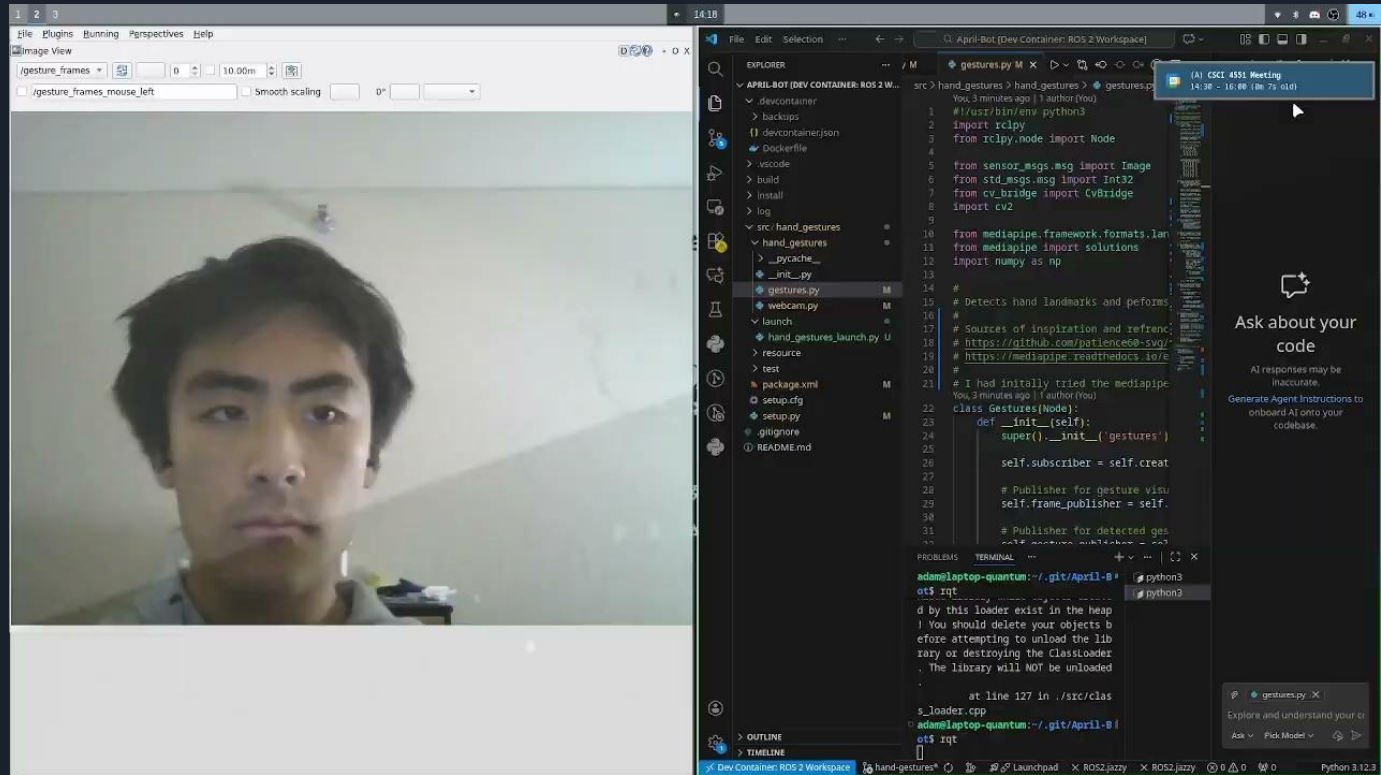
Completed Gazebo
World Package



Completed April Tag
Detector

Working on SLAM
navigator

Hand Gestures





End of Project

- Gesture-controlled robot that navigates through a simulated environment
 - Using April tags
 - LIDAR
 - Odometry
 - SLAM
- The robot will be able to search and find any April tag indicated by the user while avoiding all obstacles



Questions?