

22nd March - 2025

Goal : Make their robot work (Autonomous)

1st Issue Faced : Need to get ROS-1

We are using : ArUco marker Detection

### Problem Statement:

- Autonomous follow-the-leader
- Make your bot follow leader bot using ArUco marker-based tracking
- The bot should maintain constant distance.

### Main Objectives :

- Leader detection
- Distance Maintenance
- Dynamic Path Adjustment
- Collision Avoidance

## Hardware Doubts

→ yaw & Quaternions?

Getting all data from odom

→ Getting odom data from a topic → `uoltra_controller/odom`

→ No IMU

→ LiDAR FOV is not constrained

Disregarding certain parts in RViz directly.

## Aruco Markers

- Camera calibration.
- Get intrinsic params (focal length, etc).
- Pose estimation using OpenCV.
- Getting translational & rotational vectors.

## Pathing

- Used LiDAR data for obstacle avoidance (proximity sensor)
- To maintain distance: we will be using a PID controller.
- Using values received from Aruco marker

detection, we will follow the location  
of the leader bot.