Vichesta

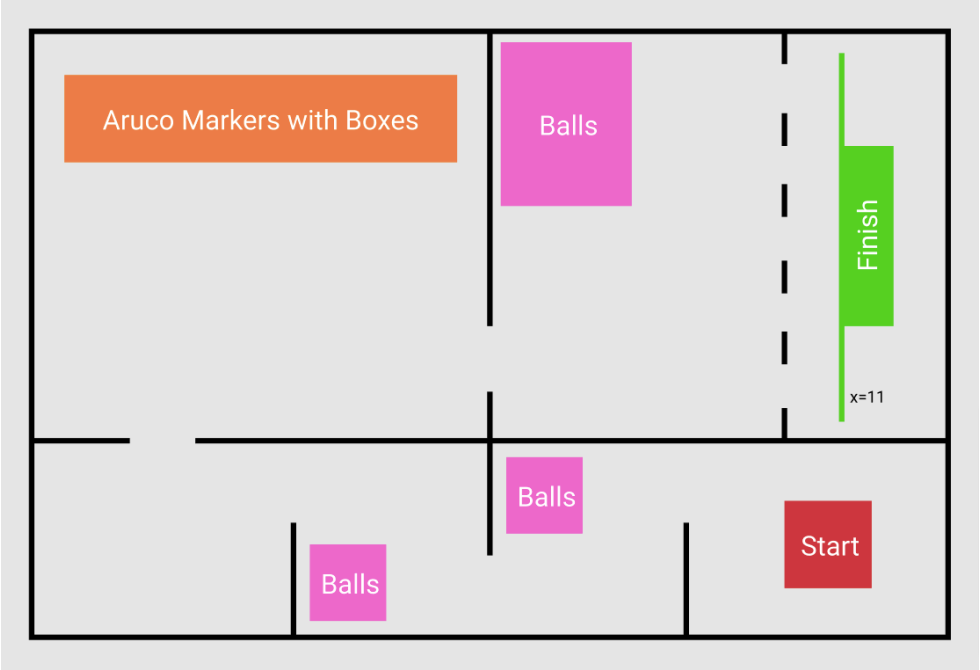
Brief

Before physically assembling a robot it is always a good idea to test whether the concepts you wish to apply, work in theory (Be it structural integrity, stress test). For bots that navigate autonomously, it is a necessity to test the working of their path planning algorithms. The theme of this task is to develop and refine a path planning algorithm that would allow a robot to navigate the given environment. There would be hurdles to avoid and tasks to accomplish before the bot finally reaches the end goal.

Objective / Problem Statement

In this competition, the teams will be provided with a ROS package that contains the simulation environment and a four-wheel robot model. The robot model has the following sensors:

- 2D LIDAR
- Intel Realsense D435i RGBD Camera
- IMU



The environment contains some balls (present only in the marked regions) and has 5 tables on top of which different colored boxes are present. Below each table, an aruco marker with a unique id is placed.

- The bot has to count the total number of balls present in the environment, let say it is X.
- Then you have to calculate Y which is equal to the remainder when X is divided by 5. Mathematically, Y = X % 5, where % represents the modulo operator that gives the remainder when X is divided by 5.
- Then you have to find the aruco marker which has the id Y and store the color of the box placed above that particular marker. Let the color is C.
- Before the finish area, there are some colored doors. The bot has to enter the finish area through the door having the color C.
- The bot has to cross the coordinate line x=11 to finish the task.

Instructions

- You will need to have Ubuntu 18.x LTS (Bionic Beaver) installed to successfully set up the environment
- The installation instructions and the ROS package are present in this Github repo https://github.com/Kartiksaini001/Vichesta-Takshak-2021
- You will need to Fork this repo and then clone it in your local machine
- Then follow the instructions provided in the README file to install all the dependencies

Contest Guidelines

- A team consists of **1-4** members. **Inter-college** teams are allowed.
- Teams will be judged based on the **accuracy** of the tasks completed, **obstacle avoidance**, and the **completion time** to reach the end goal.
- The competition requires you to complete certain tasks, on whose basis points/penalties will be awarded.
- Teams will **submit** their code as a **ROS package**.
- A **presentation** has to be prepared and presented by the **top 10 teams** explaining their idea and approach.