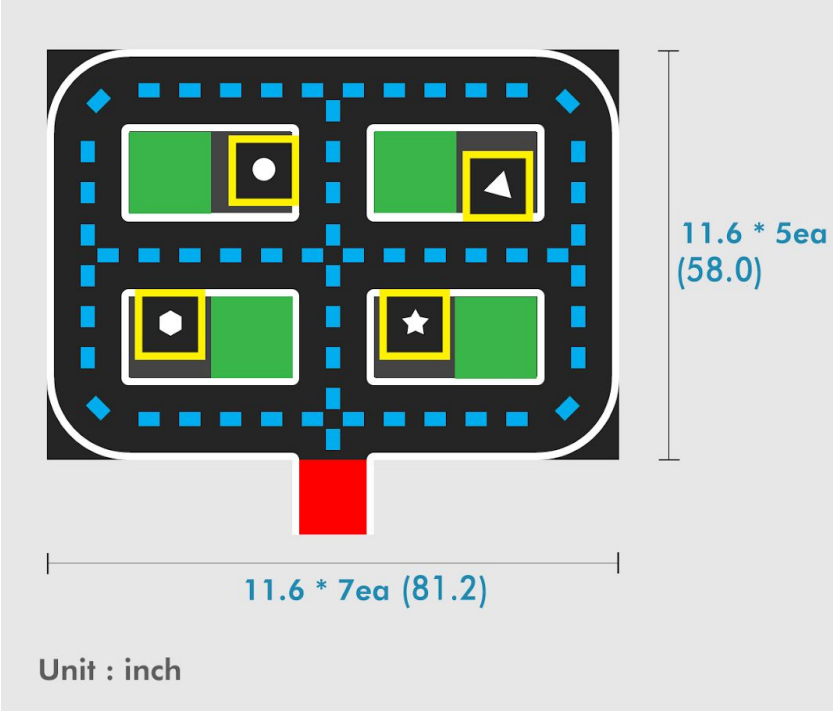
Autonomous Car Challenge: Competition Rules

Goal: “*Pick up and drop off passengers”* in under 2 minutes.

- Follow Lanes to drive around the mini city
- Park inside of designated parking locations.
- ”Honk” to notify passenger.
- Go to passengers “desired” Location and park there.
- Repeat.

The Field

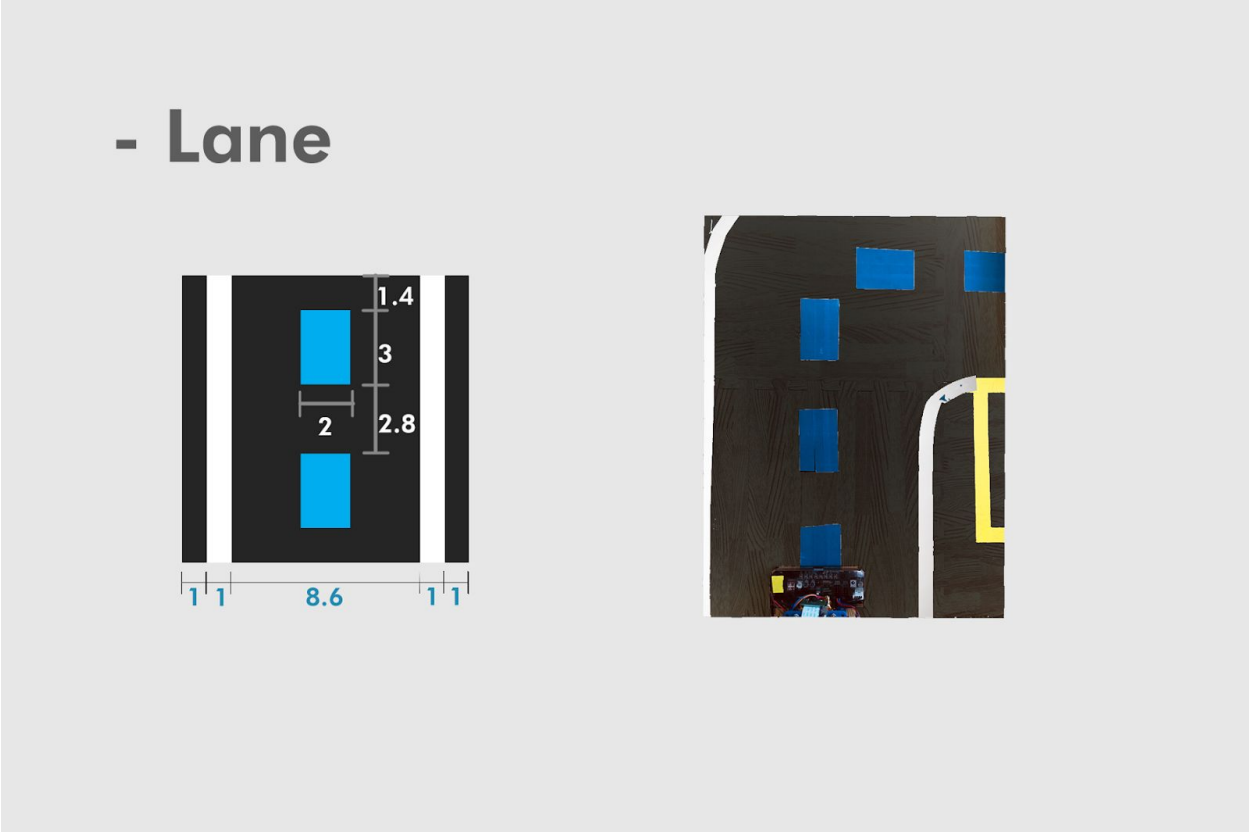
Will be a colorful arena that will allow students to rely on OpenCV and basic color detection. The actual field will have four building with parking spots. Each building will be marked with a shape, circle, triangle, star and pentagon. Start point is the red spot(Gas station)



This picture below shows ¼ of the field outline. The material of field will be soft foam puzzle mat.

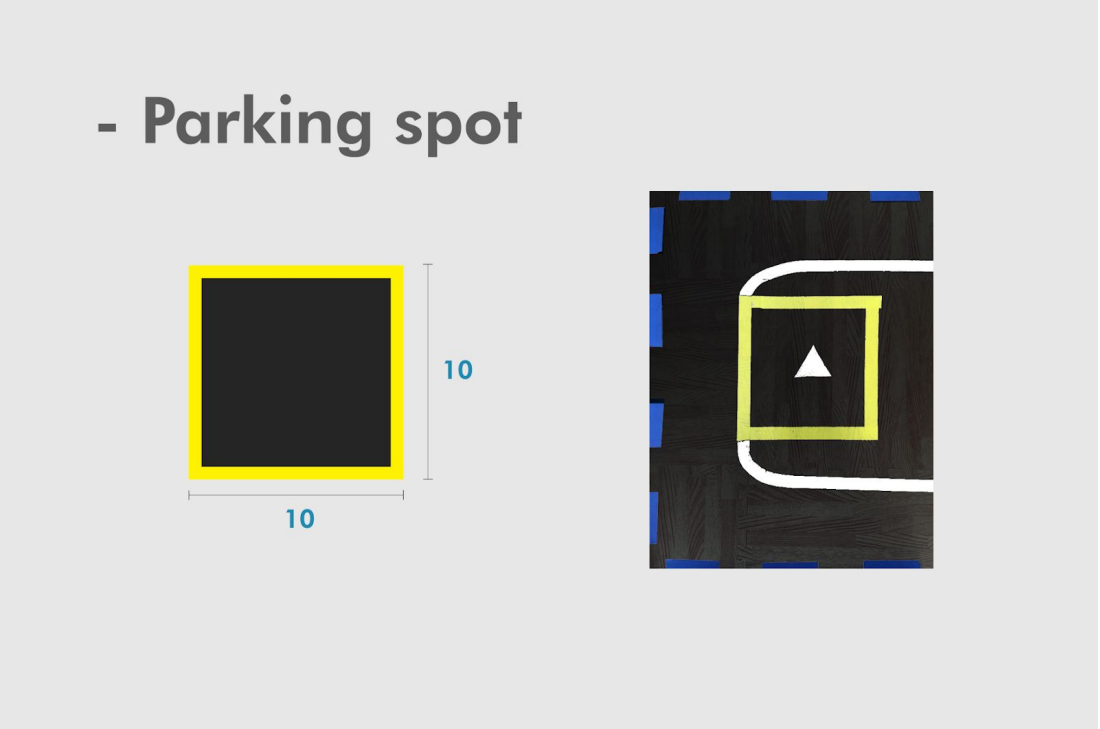
Lane Following

There will be lanes that will be easy to detect using color detection, the participant can use these marker to follow the road. In this case they are blue painters tape.

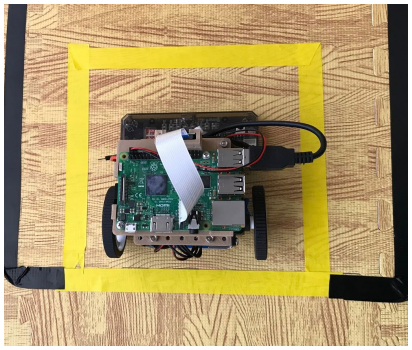


Parking Spot

The participant will be required to park in the marked locations, there will be a black shape in the center of the colored parking spot which can be used to distinguish the “building” it will be either a **triangle**, **circle**, **square** and **pentagon**.



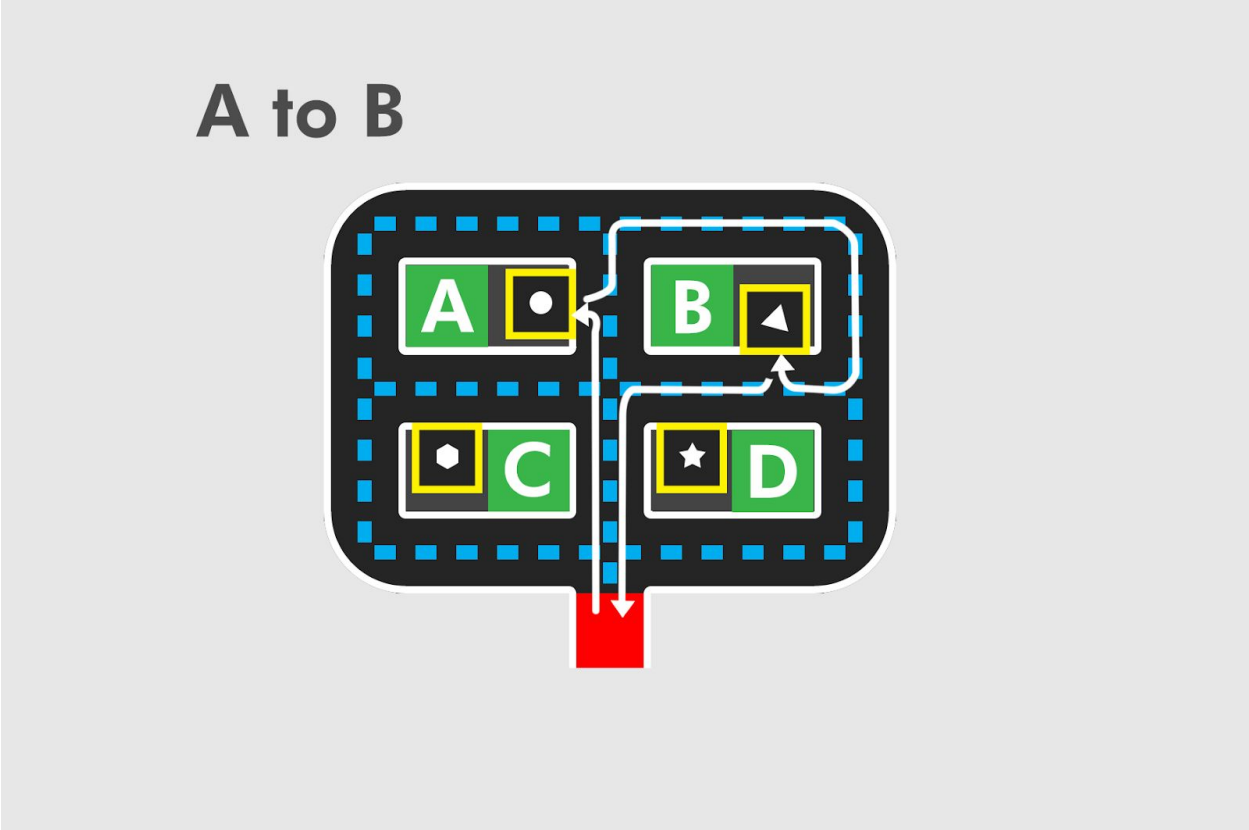
Actual size looks like the picture below. Every building has a different entrance.



Pick up passengers

A qualifying parking will counted if the user can “park” within the marked parking spot. Once inside they must stop and **buzz** for **1 second** to “honk” at the passenger. In this case the parking spot is marked with yellow tape. When they buzz the referee will send an IR message with a remote control which the RoPi should be programmed to detect. This message will

contain the next building they must go to. The message will be 1 of the other three building randomized.



Rules

ROUND 1
Autonomous Car
Within 1 minute 30 seconds

The mini city will be colorful to help younger students use color detection.
All of the marking will be on the floor so the camera will be able to detect them.

There will be four blocks with parking spots marked yellow (color may change). The student will have to park the car in the area and “pick up the intended passenger”.

Once they pick someone up they must drop them off at another one of the boxes.

- When they pick someone up a “text message” actually an IR code (Referee with IR remote will press the buttons) will be sent to the robot that the rokit onboards IR receiver can detect and now go the designated block.
- Center of parking spot will have a white shape (triangle or pentago) which can be detected with the bottom IR sensor.
- The robot will have park and stop moving for 1 seconds and then buzz for that duration to notify the referee that the student has parked, the referee will then send the IR code during this period.

ROUND 2
Controller
Within 20 seconds

- Buzz as much as possible within 20 seconds. You can’t get the points from same parking lot.

Points

	points
Each Parking Buzz	+10
Come back to the gas station	+5

Each Controller Buzz	+5
Each touching the lane	-1