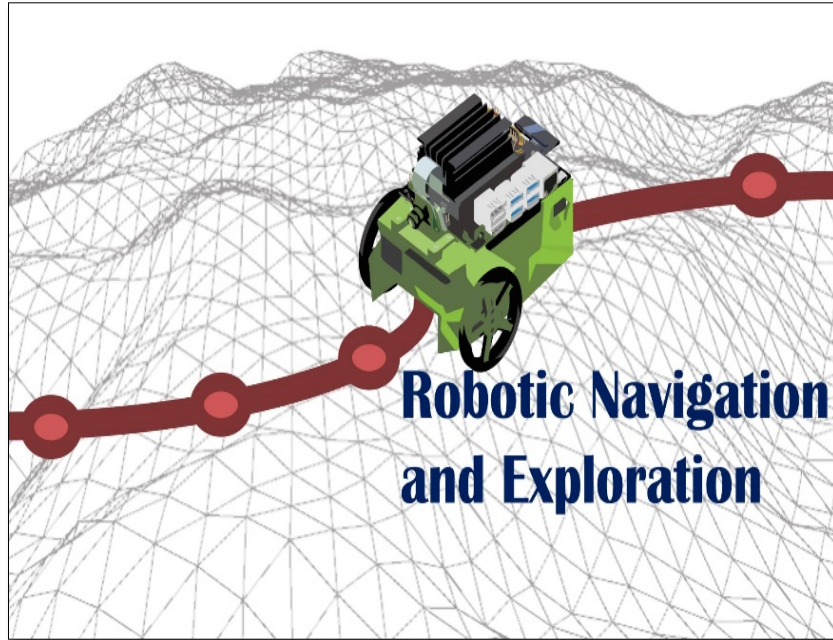


# CS562000 Robotic Navigation and Exploration

## HW1 Navigation



In the last two labs, we had learned how to do “path tracking” and “path planning” in different ways. Now, is the time to combine these two tasks and move forward!

You will need to complete lab1 and lab2 first, then use part of them to finish this assignment.

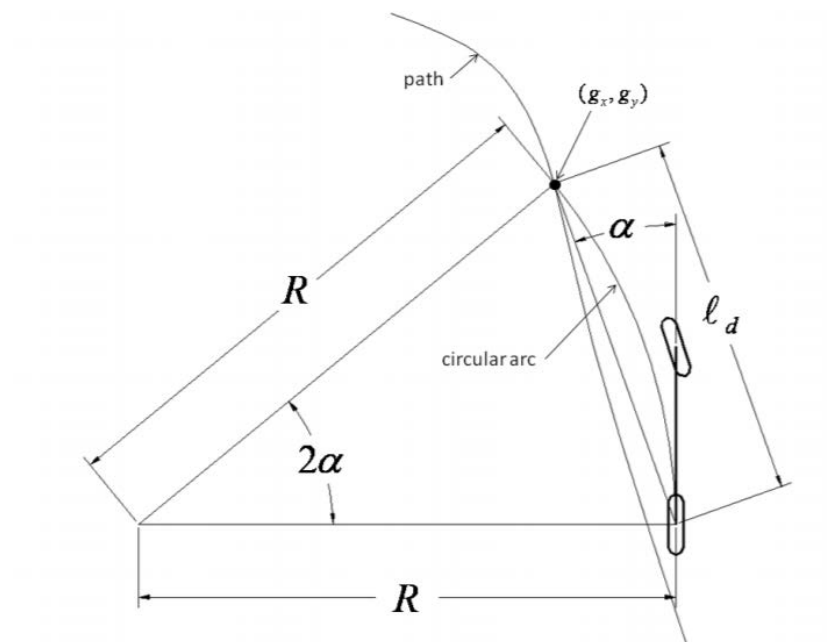
Please do the following tasks:

### Main.py:

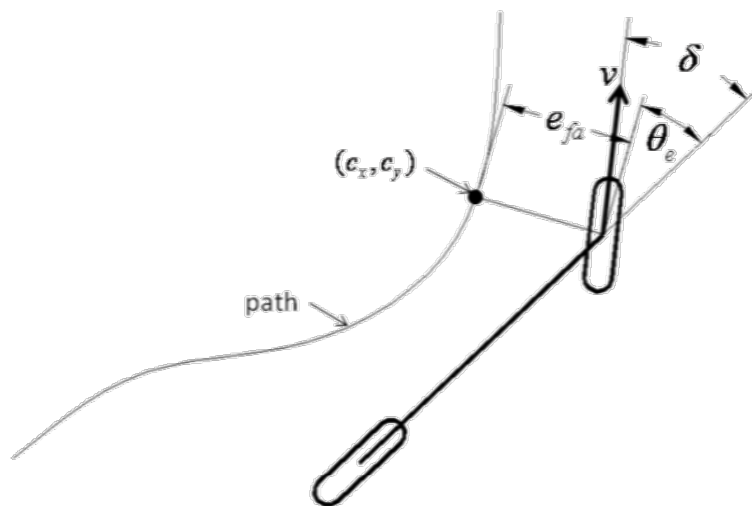
You need to call path tracking and path planning function here, you can design your own command to demo, just remember to write a readme.md file to tell your TAs how to execute your code.

## Path tracking (50%):

### 1. bicycle\_pure\_pursuit.py (25%):

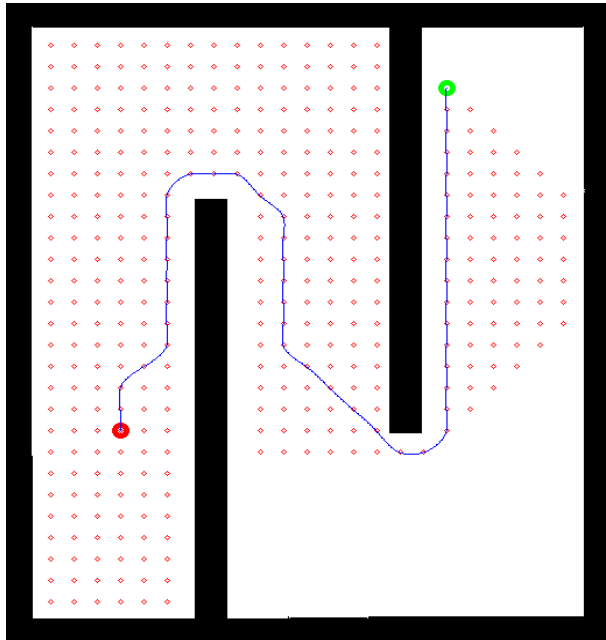


### 2. bicycle\_stanley.py (25%)

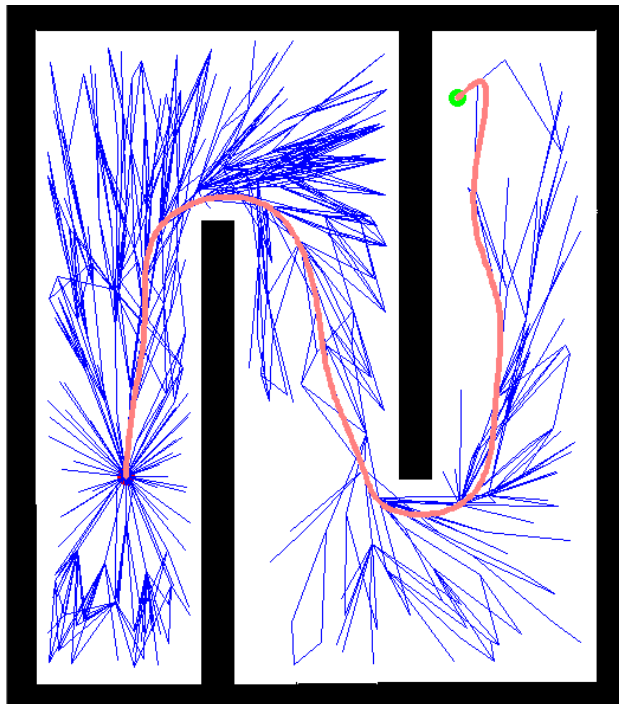


## Path planning (50%):

1. `dijkstra.py` (25%) (You will need to convert Dijkstra to A\* in this code)



2. `rrt_star.py` (25%)



## Bonus (10%):

### 1. Collision handling (10%)

Path planning only considers the location of the car, so initially, the orientation of the car may not face directly to the destination. Thus, a large turn is required for the car to correct the orientation. Please design a feedback control to recover from collision, or instead, try to ensure that the car will not collide with any obstacles.

---

### Request:

1. Please upload hw1 file in format “AS1\_studentID.zip”.
  2. Don't forget to write a Readme.md to tell your TAs how to execute your code.
- 

**Attention!! You will get no grades if you offend this.**

1. No cheat.
2. No delay.
3. No plagiarize.

**The result may look like this.**

<https://www.youtube.com/watch?v=R4RHRWTZcnc&feature=youtu.be>