

Project: Part 3

24-677 Special Topics: Modern Control - Theory and Design

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Due: Nov 16, 2023, 11:59 pm.

P3: Problems

Exercise 1

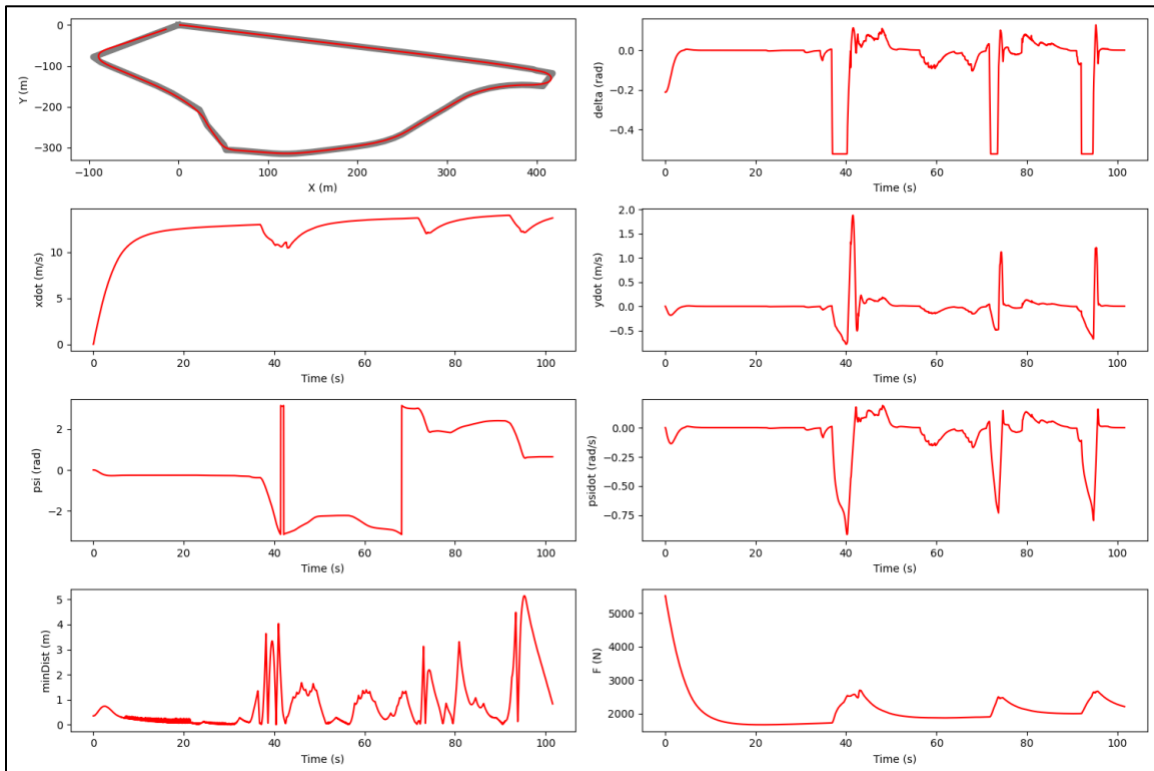


Figure 1. The final completion plot using my LQR controller.

```
Evaluating...
Score for completing the loop: 30.0/30.0
Score for average distance: 30.0/30.0
Score for maximum distance: 30.0/30.0
Your time is 101.536
Your total score is : 100.0/100.0
total steps: 101536
maxMinDist: 5.140777021230266
avgMinDist: 0.8281291182830609
INFO: 'main' controller exited successfully.
```

Figure 2. The final score message from Webots simulation using my LQR controller.

Exercise 2

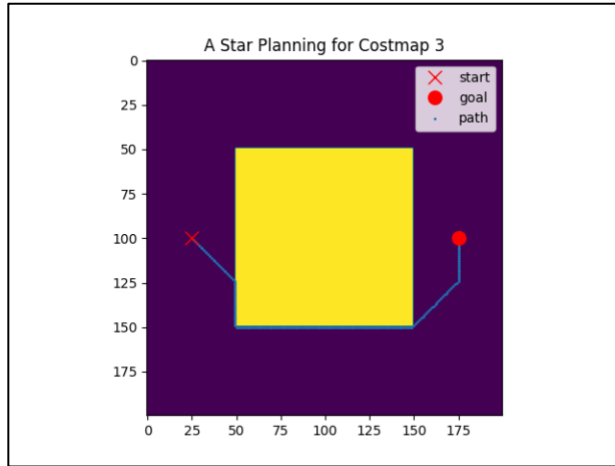


Figure 3. The path planning results from my Astar_script.py.

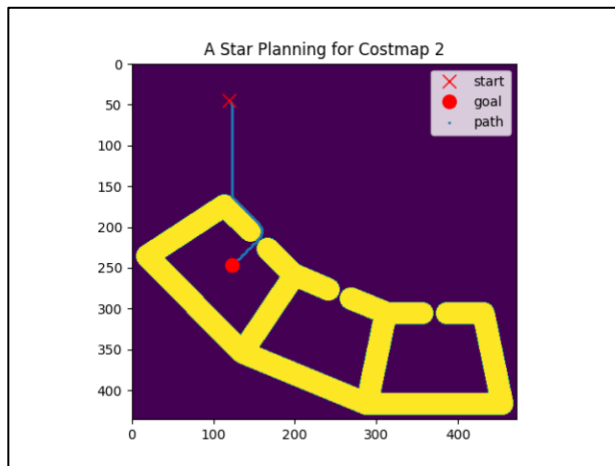


Figure 4. The path planning results from my Astar_script.py.

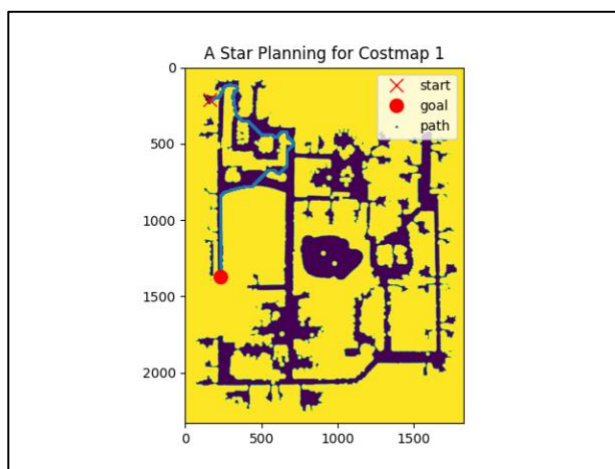


Figure 5. The path planning results from my Astar_script.py.

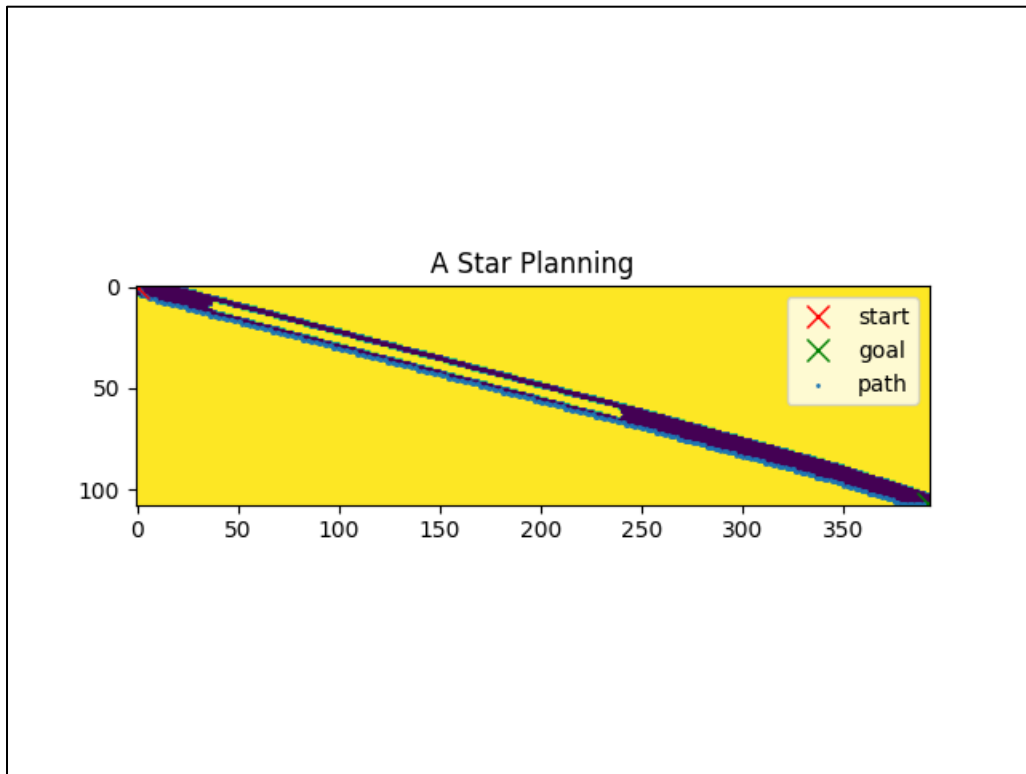


Figure 6. The path planning results from my Astar.py.

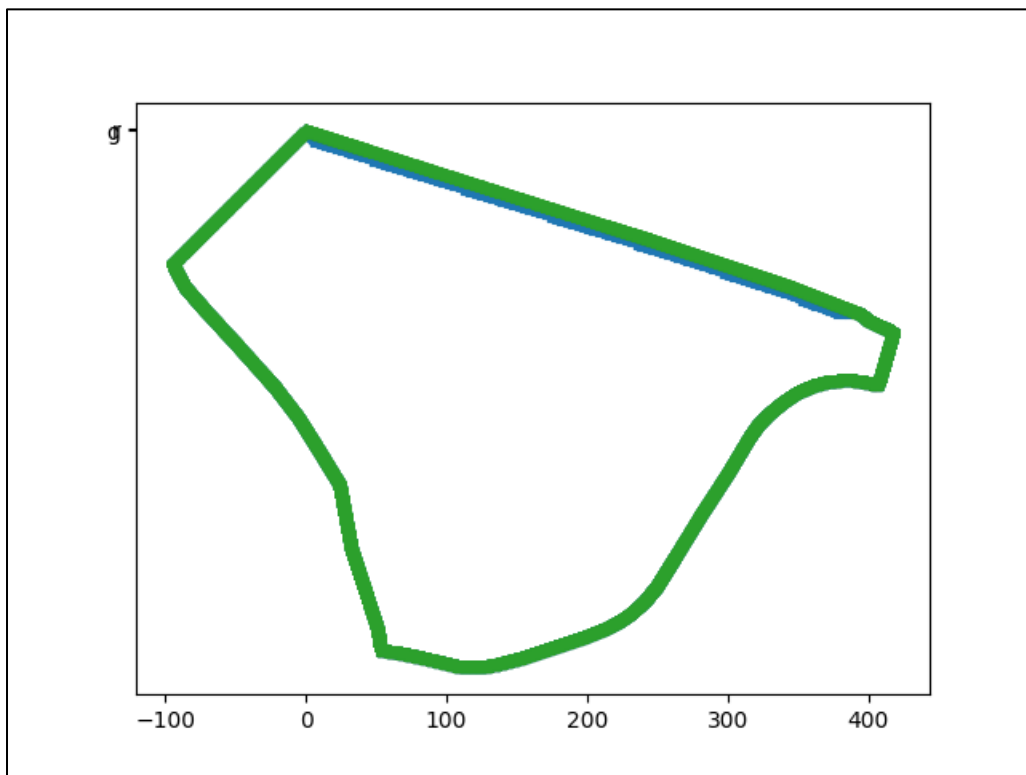


Figure 7. The path planning results from my Astar.py.

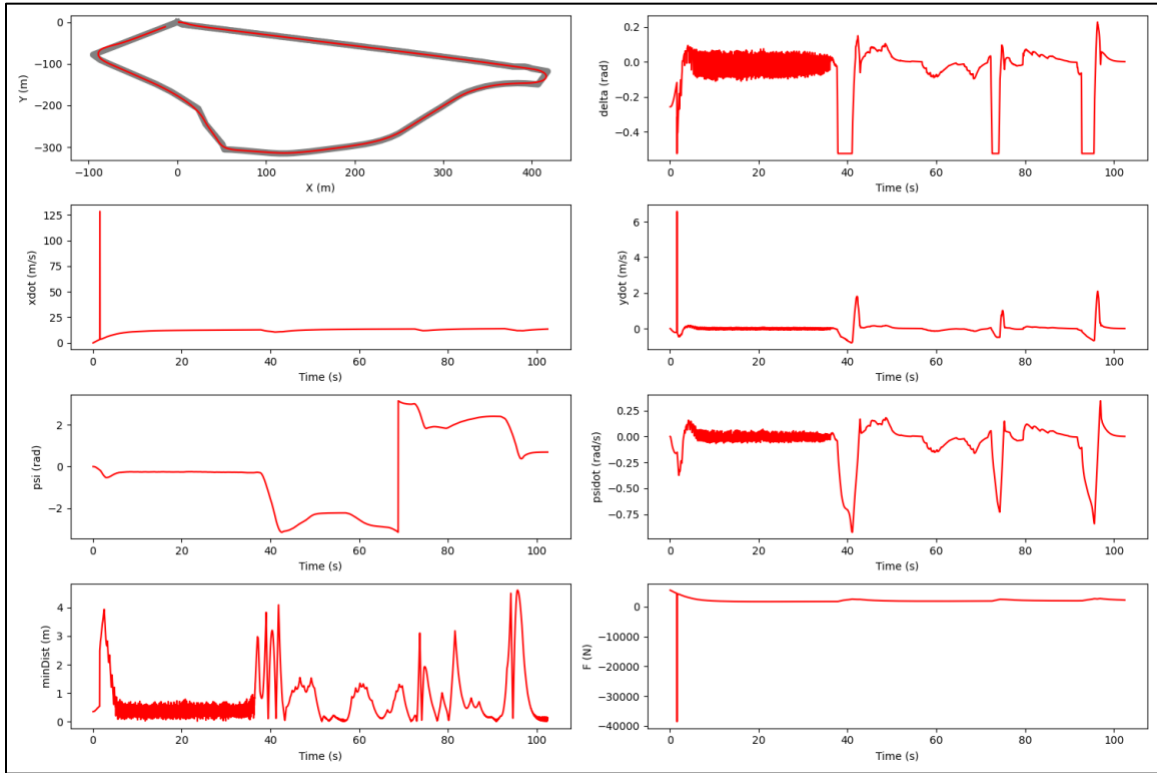


Figure 8. The final completion plot using my A* algorithm & my LQR controller.

```
[[0 0 0 ... 1 1 1]
 [0 0 0 ... 1 1 1]
 [0 0 0 ... 1 1 1]
 ...
 [1 1 1 ... 0 0 0]
 [1 1 1 ... 0 0 0]
 [1 1 1 ... 0 0 0]]
map size (108, 393)
reach goal
path length 393
total steps: 102464
maxMinDist: 4.606402184992135
avgMinDist: 0.8091769190754369
INFO: 'main' controller exited successfully.
```

Figure 9. The final score message from Webots simulation using my A* algorithm & my LQR controller