

Lab #1 Report

Tyler Southwick, Taylor Southwick

1 Potential Fields

1.1 Usage

We ended up using reflective fields around the obstacles as they seemed to work better than the tangential fields. At first, we had a guy moving really slow and he followed the fields exactly. But, as we speed him up, we found that he could get caught in the tangential fields on the four l's world. By having the walls repulsive with $\beta = 1$ and s equal to the `maxDistance` from the center of the obstacle to the furthest out edge, making a disk, plus 5 ($s = \text{maxDistance} + 5$) the agent could successfully navigate through the obstacles.

1.2 four_ls

Figure 1: Potential field towards flag or base

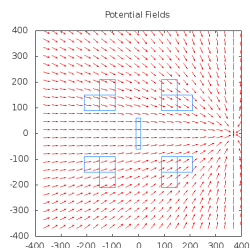
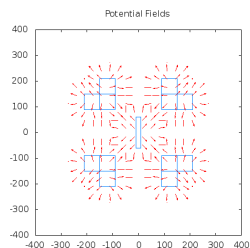


Figure 2: Potential fields away from obstacles



1.3 rotated squares

2 Tests

We tested our agent against Daniel Brown and Ryan Hintze's agent. Our PF agent lost against theirs. We had our PF agent going really slow to guarantee that he followed the field path. After we ran the tests, we tweaked the values of the different fields as well as our controller and were significantly able to increase speed.

Figure 3: Potential fields around obstacles (Tangential)

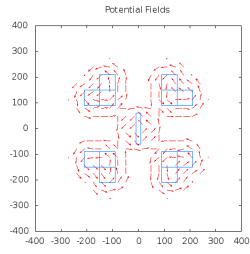


Figure 4: Potential field towards flag or base and away from obstacles

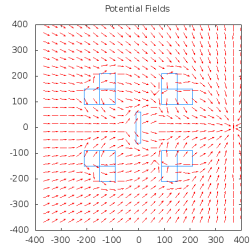


Figure 5: Potential field towards flag or base

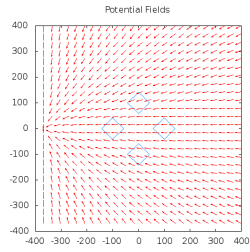


Figure 6: Potential fields away from obstacles

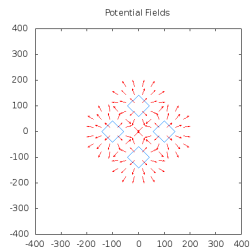


Figure 7: Potential fields around obstacles (Tangential)

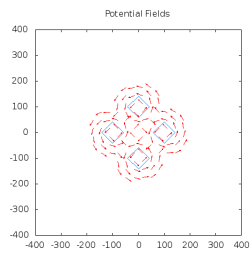


Figure 8: Potential field towards flag or base and away from obstacles

