CS 747 Assignment 3

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Contents

1 Agent

- I have taken the positions of white ball in one numpy array and all colored balls into a single numpy array from the ball_pos.
- since in the problem statement they have mentioned that the agent can use the get_next_state around 15 times, I want to see what will be the next state when I hit max(number of color balls, 15) number of color balls.
- So, to hit the each color ball, first I want to select to which hole I am going to hit the selected color ball(say this selected color ball to hit as target ball), I have calculated the distances from this target to all the holes and taken the hole which is nearer to the target.
- After selecting the target color ball and hole , now I have to calculate the at what angle and force should I use so that the target will go into the selected hole.
- For that I have used the diagram given in the problem statement, and found out the what place should I aim so that when I hit, the color ball will go in the direction towards hole in a straight line.

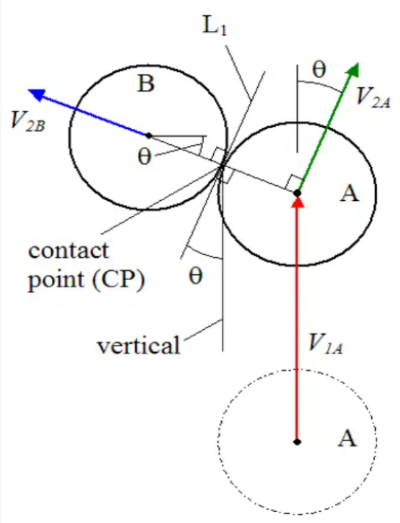

Figure 1: Collision

- Imagine in the above figure the dotted circle A is cue ball before hit and ball B is the target ball(colored ball) we have to hit.
- So after collision the ball B will go in the direction of the blue colored line, so our hole should be in the direction of blue color line. From the hole and colored ball we will get the blue color direction and In that direction if we move from the center of B backward around 2 $\times$ radius distance, we will get the exact center (thick colored A ball) to hit.
- After getting that fake_target where we suppposed to hit so the target will go in the direction of hole, I calculated the angle (direction) to hit the cue ball.
- So, for every colored ball, calculated the angle to hit and for each next state calculated, I choose the state which has number of balls are less then balls present now(that is before shoot ball_pos), and taken that as the best strategy to use(that is atleast one colored ball went to hole) and return the angle in agent.py and I have used fixed force magnitude of 0.75 for the better performance.