Software Notes

# Overall To-Do list:

* Get Dummy team to move to specific “initial positions” for testing
* Find out how to get past a single defender
* Teach offense to make a good shot
* Find out how close we need to be to make an effective shot on goal
* Find the ideal “shootable” spot
  + Ideal = closest, furthest from defenders, best shot on goal

## Things to Fix:

## Things to Improve (working, but needs enhancement):

* Have defender move to ball when it’s open
* Robot avoidance - handle different cases. Currently it is too hesitant to get the ball because it’s trying to avoid robots
* Have offense give defense some room to kick it forward
* Ball Intercept/prediction
  + Try calculating acceleration and use that
  + Try splitting the state call back functions into each seperate topic instead of multiplexing
  + Don’t calculate “bounces” off the goals
  + Fix velocity jumps when the ball is manually replaced on the screen

## Things to Finish Implementing:

* Kicking play

## Things to Try:

* Use open zone functions to determine where to pass the ball
* Find ways to release ball when stuck
  + Spin (?)
  + Turn and swipe (?)
* Double offense
* Double defense

## Other problems to solve:

* Ball gets stuck
* Robot collisions
  + Teammate blocking

## 

## Brainstorming

### Offensive Skills:

* Get control of the ball
  + Simple: Position behind ball facing next destination
  + Advanced: Maximize control of the ball
    - Decide where we want to go with the ball
      * (?) Find the largest open spot at first opponent’s x
      * (?) Find closest shot spot…
        + ?? How far can we shoot effectively?
      * Plan an optimal path to that spot
    - Ball is free - just get behind and head to destination
    - Ball is in their possession - hit it away, then use “ball is free” method
    - Ball is stuck -
      * Spin robot? Put spin on ball?
      * Kick (but don’t kick robots or the wall!)
      * Back away, then reclaim possession
* Get to an open spot
  + Avoid opponents when we have possession
  + Kick or dribble ball away when they are close
    - Maybe use open spot finder
    - Maybe tell path planner to do spline curve when we have possession.
* Make a shot
  + Move towards ball in kicking direction
  + When ball is against kicker, KICK HARD!

### What to do once we get to the ball

* We have the ball in the open
  + Dribble the ball to somewhere we can make a shot
* The opponent is close and fighting for the ball
  + Kick the ball into an open spot and race to get it first
  + Kick the ball off the wall to an open spot, hoping they will follow it the wrong way and create an opening
  + Spin the ball out from between robots
    - Maybe have small stubs on the corners to allow us to spin and toss the ball out of a sticky situation.

Use this bash function to publish destinations to the system.

publish\_destination() {

X=$1

Y=$2

THETA=$3

echo "publishing destination at x=$X, y=$Y, theta=$THETA"

rostopic pub -1 /slash\_dash\_bang\_hash\_home/ally1/ally1\_destination slash\_dash\_bang\_hash/State "{x: $X, y: $Y, theta: $THETA, xhat: 0.0, yhat: 0.0, thetahat: 0.0, xdot: 0.0, ydot: 0.0,

thetadot: 0.0}"

}