Assignment 6: Goalie and Penalty Kick Tournament
CS 393R: Autonomous Robots
Due Date: 9:00 AM Thursday, October 29, 2015

Your task: Compete in the Penalty Kick Tournament. Each game will involve two robots. One robot will be take on the role of goalkeeper and the other robot the role of attacker. Teams will take turns attacking and defending, with 30 seconds of setup time before starting the round and 30 seconds of setup time when switching from attacking to defending or vice versa. Thus each round proceeds per the following table:

Setup Period	30 seconds
Home team attacks, Away team defends	90 seconds
Home team attacks, Away team defends	90 seconds
Setup Period	30 seconds
Away team attacks, Home team defends	90 seconds
Away team attacks, Home team defends	90 seconds

It is **strongly** recommended that you use button presses for transitioning between attacking and defending. For example, see the `ButtonModule` for code that handles chest button presses and state transitions:

https://github.com/utaustinvilla/robotics/blob/master/core/sensor/ButtonModule.cpp#L112-L139

A team wins the round if they win a majority of the games. For placement in the semifinals, teams will be ranked on accumulated points. Winning a round is worth 3 points, and a tie is worth 1 point. Note that points for the purposes of placement differ from points rewarded for grading.

Attackers will start on the left or right side of the ball relative to the goal, facing in the ball's general direction. The attacker must walk to the ball, turn approximately 90 degrees toward the goal, and then shoot. You may reposition the ball if you want, but you must shoot the ball from outside the goal box.

The goalie will start out positioned at the center of the goal and must stay within the goal box. The goalie may execute blocks, but no diving is allowed. The goalie may only block for 5 seconds, and may not repeatedly and excessively execute blocks. Some blocks are available here:

https://github.com/utaustinvilla/robotics/blob/master/core/python/pose.py#L167-L203

The attacking team wins if they are able to score a goal within 90 seconds. The goalie wins if the timer expires, if the goalie stops the ball from entering the goal, or if 30 seconds pass without the attacker touching the ball.

Landmarks will include beacons along the sides of the field, the blue goal, and a white goal box. The complete field configuration is specified at the following link.

http://www.cs.utexas.edu/~pstone/Courses/393Rfall15/assignments/tournament_fields.png

Do not forget to write a short but professional memo (one memo from each team, co-authored by all team members), concisely but clearly describing what you did, what problems you encountered, how you overcame them, and how successful you were in the end. Also be sure to briefly describe the contributions that each team member made to the final outcome.

Checklist:

1. [_____] (4 points) Win all 4 placement rounds in the tournament (1 point per win, 0.5 points per tie).

2. [_____] (2 points) Perform a shot on goal in the correct direction from outside the goal box.

3. [_____] (2 points) Move the keeper within the goal box so that it stays between the ball and the goal.

4. [_____] (2 points) Clarity and quality of your memo.

Extra Credit:

5. [_____] (.5 points) Make it to the semifinals.

6. [_____] (.5 points) Make it to the championship game.

7. [_____] (1 point) Win the championship.

Tournament Schedule

Round	Field A				Field B			
	Home	Wins (G/D)	Away	Wins (G/D)	Home	Wins (G/D)	Away	Wins (G/D)
1	Team 05		Team 01		Team 10		Team 08	
2	Team 12		Team 02		Team 06		Team 03	
3	Team 10		Team 07		Team 09		Team 01	
4	Team 06		Team 08		Team 05		Team 12	
5	Team 09		Team 03		Team 07		Team 02	
6	Team 12		Team 09		Team 06		Team 02	
7	Team 01		Team 03		Team 05		Team 07	
8	Team 08		Team 02		Team 10		Team 09	
9	Team 07		Team 06		Team 01		Team 12	
10	Team 05		Team 10		Team 03		Team 08	
Semi								
3rd Place								
1st Place								

Team Points

Team 01	Team 02	Team 03	Team 05	Team 06

Team 07	Team 08	Team 09	Team 10	Team 12