School of Computer Science

CPS 813/DG8010 –Human Robot Interaction
Lab 3 – Learning about Manipulation, Interaction and Time Pressure through Robot Soccer Penalty Shots
(Winter 2017)

The Environment and Concepts:
There exists a "pitch" facilitating "rounds" of soccer between two wirelessly robots. One robot is the "kicker", the other is the "goalie". Each robot must have a human operator.

Pitch

The soccer "pitch" or field is shown to the right. There are 5 round dots that represent balls that are temporarily affixed to the surface until they are retrieved by a kicker.

Rounds

Points can be scored when a round has started. Each round is 3 minutes long.

Kicker

Points are scored by a kicker when a ball is caused to move into a scoring area (points awarded as shown). The kicker must stay on the left of the pitch and cannot cross the "shoot line".

Goalie

A goalie starts out with 10 points. Points are deducted based on the amount of points earned by the kicker for a shot (-1 or -2). If, however, the goalie is successful in stopping all balls, 2 additional points will be awarded. If the goalie fails to stop all balls a penalty of -2 points will be applied. The goalie must stay on the right side of the pitch and cannot cross the shoot line.

Operator

The operator operates a robot using its human interface. The operator cannot see the pitch directly.

Required:
Each group must use the same robot as both kicker and goalie. The robot must occupy a space no larger than a 10" cube when deployed but may expand afterward.

Each robot must complete each of the 3 rounds described below (in any order).

1) Kicker round--A kicker robot is alone on the pitch and must score as many points as possible. (max 10 points)
2) Kicker Meet Goalie round--A kicker robot is on the pitch with a goalie robot facing it. (max 10 points)
3) Goalie Meet Kicker round--A goalie robot is on the pitch with a kicker robot facing it. (max 10 + 2 points)

Scoring:
The lab will be marked out of 20 (Note that there are 32 points that can be scored per robot). Marks will be allocated as follows:

- 0.5 marks: 8.5 in x 11 in printed sheet with the title "CPS813/DG8010 Lab 3". The sheet will indicate the name and student numbers of each member of the group and the name of your robot.
- 0.5 mark: Submit an edited video file named "`CPS818DG8010Lab3<robotname>.mov`" no longer than 2 minutes showing the performance of your robot performing in the 3 rounds.
- 19 marks: based on performance with scaling points to fit available marks.