Team : BotNet

Members : Josh Powell, Adam Hastings, Yazan Halawa, Brian Russell

Objective: The purpose of team BotNet is to design a team of robots that will play soccer against another team of robots. The robots will be autonomously controlled, and tracked using image processing.

Rules:

1. Robot must fit in an 8 inch diameter can.
2. Robot must not trap the ball. Ball must be approx. 70% visible from all angles.
3. Robots may not be remote controlled.
4. Robots may not hit into or damage other robots.
5. Basic soccer gameplay will be followed

Materials:

1. 2x Nickel Cadmium Bateries 7.2V
2. 2x Roboclaw to drive the motors 5A
3. 5V voltage regulator
4. 12V voltage limiter
5. 3x motors
6. ODroid U3 Board – Ubuntu 14.04
7. 3x wheels
8. Wireless Transmitter

Basic Form:

1. 3 Wheels
2. Body of Aluminum, Plexiglass, or 3D printed
3. Must wear “jersey” for purposes of Image Processing

Movement:

1. Controlled by powerful overhead computer with low latency web cam. Image delay approx. 15ms. Position determined by overhead camera – Error introduced by angle.
2. Each wheel will have 1 motor. Two of the wheels will be controlled by the same “roboclaw”, the other wheel will have a dedicated roboclaw.
3. Use PID controller to control robot movements.
4. Using equally spaced and angled wheels robot should move in any direction.
5. Unequally spaced wheel design could make a robot move faster in one direction, but turn slower. This would lead to the robot having a front.
6. Need for a calibration script to correct for physical differences

Strategy:

1. Basic Plays – Blocking, Rushing, Matching
2. Positions – Offense / Defense

Tools:

1. Simulink – Simulator
2. OpenCV
3. ROS – Robot Operating System