MEAM510 2021A

Final Project Assignment

Create a robot that will play the game. In the process you will be graded on 3 aspects
- 15% Design Review Progress and Participation
- 50% Required Functional Performance
- 35% Final Report

Design Review Progress and Participation

Two design reviews will be held during recitation time: Design Review 1 on April 9, and Design Review 2 on April 23.

5% April 9
Design Review 1 is a concept review in which you will present concepts for your approach. Short presentations to the TA/coach and group will be expected. You may submit slides that include a figure that illustrates the robot and it's components. Include a list of all major components and where they will be acquired (major components include all electronic chips/drivers/CPU's, sensors, motors and mechanical components that cost more than $1).

10% April 23
Design Review 2 is a progress review in which you will present your progress and is expected to include videos of any achieved minimum functionality and slides that describe the path forward. Grades will be based on expectation that a fully functioning robot will be ready in time for the grading evaluation period after 11 days.

Required Functional Performance

50% April 4 - April 7
1. Minimum requirements for passing Final Project.
    a. User control of remote mobile base on the field to directed targets
2. Minimum requirements for full marks on Final Project. This will be tested as if during normal game play but with no other robots on the field. Robots will be tested to see if they can achieve the following before the game time expires:
    a. Move at least one can to doubling circle.
    b. Move at least two cans from opposing side to score on your side.
    c. Show at least one autonomous behavior:
        i. Wall following, make full circuit
        ii. Locate and move relative to a beacon or lighthouse

Final report

35% Due April 29, but accepted without penalty up to May 14.
Submit a final report that includes the following sections:

Functionality

- A high level description of your approach to winning the game with an explanation of the design choices you made.
- describe minimal functionality approach
- describe extra components

Mechanical Design

- describe intended approach and actual performance
- include things that you tried but failed (and thus learned from)

Electrical Design

- describe intended approach and actual performance
- include things that you tried but failed (and thus learned from)

Processor architecture and code architecture

- include a block diagram of how MCU's are logically connected
- describe software approach
- include things that you tried but failed (and thus learned from)

Retrospective

- What you feel was most important that you learned
- What was the best parts of the class
- What you had the most trouble with
- What you wish was improved
- Anything else about class.

Appendix

- BOM (Bill of Materials), which list the items and quantities used to construct your robot and controller.
- Schematics of all electronic circuits
- Photo or rendering of full robot
- CAD drawings (or mechanical drawings) highlighting anything special
- All data sheets for all components (either links or copies of data sheets)
- Upload all code to canvas (separately)
- Optional if you have fun competition video links please add.