**Take-Home Exam (Due December 5ᵗʰ)**

Introduction

For the first Take-Home exam you implemented an algorithm to navigate through a maze. Now, you are required to implement a similar algorithm, but this time in C. The maze we want to solve is shown in Figure 1 (please download the maze as a GIF file from the EE289 website). The image is 207×207 pixels; each square is ~18×18 pixels; and the walls are ~1-2 pixels wide. The image is noisy, so you will have to account for "noisy sensor measurements" during navigation.
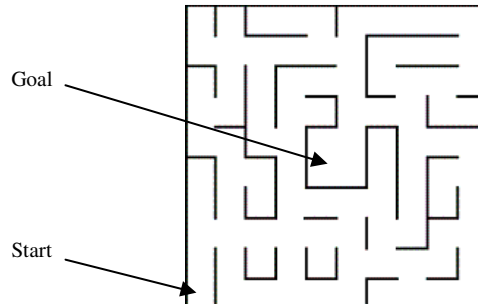
Figure 1 Maze to be solved for the exam.

Take-home requirements

- In this exam you are required to implement a path-planning algorithm in C, to be able to navigate through the maze shown in Fig. 1, from the START position to the GOAL position.
- The program should produce a map of the route found by your algorithm. You also need to provide instructions, or a program, on how to display the maze and the path generated by your program, in MATLAB.
- Your algorithm has to obey the micro-mouse rules set forth by the IEEE (you can find more information at this link: http://ieee.ucsd.edu/files/micromouse-rules.pdf).
- Solve the maze as it is; do not simplify it.   Your algorithm will have to navigate through each pixel from the START to the GOAL position.
- Assume that your virtual mouse is 10 pixels wide, and that it is required to be as close as possible to the center line, and the turns will be 90° so that the mouse does not run into walls.

Items to hand in (by email)

A word document which will contain the following items:
- Name of the student, the project, and the date.
- In subsequent pages you need to include:
    - **(10 %)** A description your algorithm.
    - **(20 %)** A flow chart of your algorithm.
    - **(60 %)** A well documented C program. Use functions as much as possible, and avoid spaghetti code.
    - **(10 %)** A conclusion section that summarizes your comments on the project.
- Include any references in the last page of the document.

A hand-coded solution of the maze in C is unacceptable.

Academic honesty

This is an individual assignment, and every student is expected to demonstrate personal integrity. Students are allowed to consult the internet, textbooks, reference books, and class notes. Exchange of information during this take-home examination is strictly prohibited. Students, who consult resources other than the ones mentioned above, will be penalized heavily. Take-home exams turned in later than the due date will not be accepted.