

Demo 2 Instructions*

EENG450AB: Systems Exploration, Engineering, and Design Laboratory

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1 Demonstration Period 2

Demo period will start April 9th and end April 16th. Teams that complete their runs on April 9th will receive 100% of their score. Teams that complete on April 11th will receive 90% of their performance score. Teams that complete on April 16th will receive 70% of their performance score. Teams that do not complete by April 16th will receive a zero for their performance score.

In the second demo, the robot must be able to detect two beacons, use these beacons to determine the starting location of the robot, and then move to a second specified location (relative to the beacons). Each team will have 4 trials. If the robot does not move to the specified location within 30 seconds, a restart is charged. If the robot moves but fails to stop, a restart is charged.

2 Performance Scoring

The performance metrics for the robot are

- Number of required restarts before completing all tests
- Average error between estimated and actual starting position
- Average error between desired and actual final position
- Average time to complete a run

The score for each category is determined as follows:

- Best score in category (B): 55 points
- Other scores (S):
 - Time and distance: $\frac{B}{S} \times 50$
 - Failures: $50 - (S - B) \times 10$

The best score is determined on the first day that a team successfully completes a demo, and only teams that achieve this score on that day receive 55 points. Teams that complete their demos later have a max of 50 points in each category. Teams earn the sum over all available categories, up to a max of 100 points. The final score is then multiplied by the relevant percentage for the day that the team completes the demo.

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3 Documentation

Team should provide documentation relevant to their design and implementation, along with a discussion of expected performance.

All reflection logs are to be uploaded to Canvas weekly. The following documentation should be saved in a directory called "Demo 2 Documentation" in your team files on Canvas before the demos begin.

- Team contract
- Weekly work log
- Well organized record of all models created in Simulink.
- Well organized Arduino sketches with detailed comments.
- Well organized Python code with detailed comments.

4 Design Scenario Assignment

Part of your Demo 2 score grade will come from your completion of a short design scenario assignment. In this assignment, you will be presented with a design case study, and asked to present a plan for coming up with a successful design. More details will be forthcoming.