

Verification 2: Experimental

The experiment verification is a test of whether you have experimentally adjusted a mechanical or control parameter for your robot in order to optimize its performance.

A presentation of your experimental verification will take place during your lab section. Please read the checklist carefully, and make sure your presentation is 3 minutes or less.

Experimental test (3 points)

Make a brief PowerPoint presentation to the TA with the following elements:

Define what single aspect of the robot's performance you worked to optimize (e.g. speed, steering accuracy, etc.) (1 point).

Describe how you varied a mechanical (e.g. piston angle) or control parameter (e.g. proportional feedback gain) to optimize the chosen aspect of robot performance. Note, you should have performed experiments testing 5 or more values for that parameter, with at least 10 runs for each value of the parameter. Ideally, you tried enough values of the parameter so that you can show there is one value that worked better than the other ones (1 point).

Show a graph of the robot performance (e.g. speed or accuracy) as a function of the mechanical or control parameter, and the location of the optimum (minimum or maximum) on the graph (1 point). Show the mean and standard deviation of the performance across runs on the graph.

Practical Demonstration (1 point)

Show videos of your robot working at both optimal and suboptimal values of the mechanical or control parameter you experimentally investigated.

Presentation (1 point)

You made a brief Powerpoint presentation (3 minutes or less) with the videos embedded. You presented your experimental study on time and within the allotted time given. You convinced the TAs that you have an optimized, autonomous robot.

Note, you may not use this material for your final project report. Your team will need to show experimental optimization of another parameter (i.e. an additional parameter besides the one you presented in this verification).