

Test Project

Module D Navigation and Localization

Autonomous Mobile Robotics

Independent Test project Designer: Derek Murphy, James Taylor

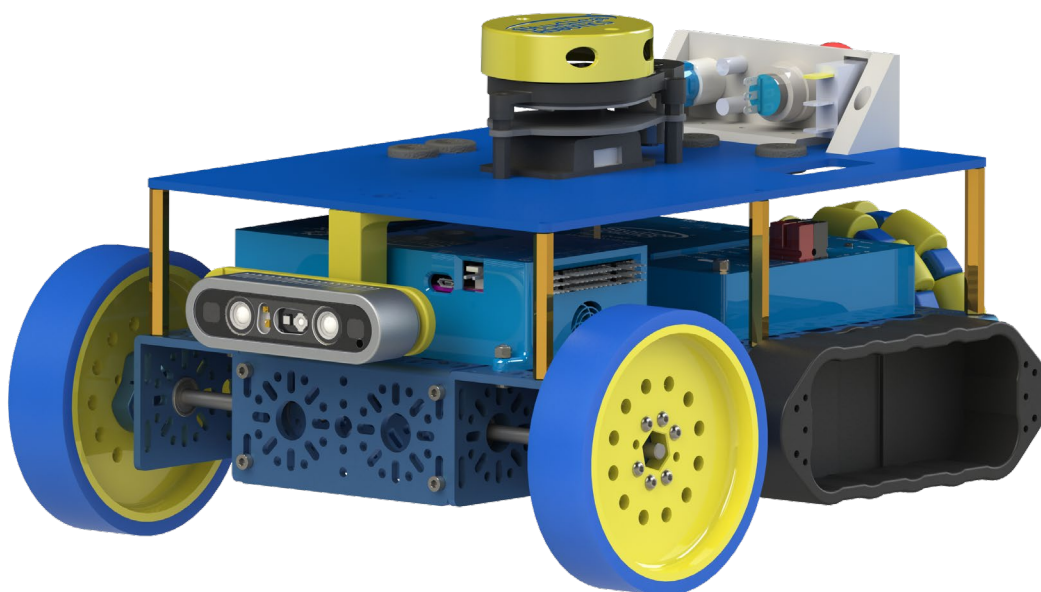
Independent Test Project Validator: Johan Benade

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Introduction

The navigation and localization module focuses on the Competitor's skill to navigate and traverse an unknown area. For this module Competitors will be provided with a robot that has two independently driven wheels in the rear/front, one unpowered omnidirectional wheel in the front/rear. This robot type was chosen via a random draw by the SMT. The robot will only have the provided sensors and systems.

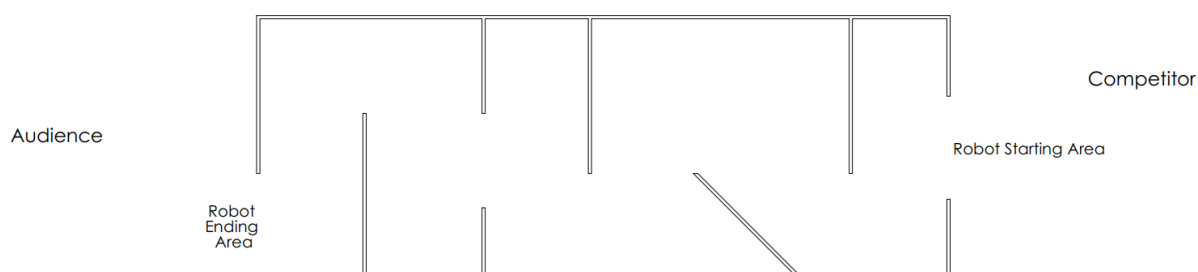


The robot will only be allowed to be programmed in Java or C++. A base project template has been provided for competitor use. Competitors may only use libraries for the code if the code has already been submitted beforehand to the GitHub repo. This code will be publicly available on GitHub repo: <https://github.com/Studica-Robotics/navigation-module-template>.

Description of project and tasks

Teams will be provided with the required robot two hours before their required test run. Competitors will also be provided with a separate login for their computer which will allow the use of the sample programming template to work from. All programming must be done using this login, **no notes or other computer access is allowed**. Competitors are not allowed access to the court except for the evaluated run. The robot must be calibrated and tested in their work area or one of the main module H courts. During an evaluation run the robot is placed in the start position (outside the outer plane of the wall opening) and must end in the end position. No code modification is allowed once the robot enters the test area. The run is considered ended when any part of the robot crosses the plane of the outer wall in the exit area.

Navigation Court



Floor is venue floor
Walls are 300mm High
Walls are 19mm Thick

NO DIMENSIONS ARE PROVIDED

Instructions to the Competitor

Once Competitors have been provided with their robot and separate login they will ONLY WORK on the navigation module task. They are not allowed to login any other account on the programming computer/computers.

Competitors are not allowed access to the court except for the evaluated run. The robot must be calibrated and tested in their work area or one of the main module H courts. During an evaluation run the robot is placed in the start position and must end in the end position (Cross the plane of the outer – wall line). No code modification is allowed once the robot enters the test area.

Robot code should be loaded onto the robot prior to entering the testing room, the robot should be started by a Competitor pressing the start button.



All code must be downloaded to the robot prior to entering the navigation run test room.

Typical test Run

1. Competitors enter the Navigation Run Room.
2. Competitors place the robot anywhere within the Start Area (Plane of outer wall).
3. Competitors must use the start button to run the robot.
4. Robot completes the navigation task; the task is considered complete when any portion of the robot touches any part of the plane of the robot ending area (plane of outer wall).
5. Competitors hit the stop button.
6. Competitors pickup their robot and leave the room.

There is a total of 15 minutes allowed to complete all the steps above. The run itself will be time from the pressing of the start button to when the robot crosses into the red area.

Robots that complete a test run (start to finish) within 600 seconds or faster will receive time marks.

Other

Remember that you have 15 minutes to complete all the steps in the task. Time marks are only a bonus.