

Sensing

Grand Challenge Design Specifications

Challenge Description:

The Grand Challenge is designed to reinforce behavior-based programming and the engineering process. It is a teacher-designed course which is not revealed to students until the day of the competition.

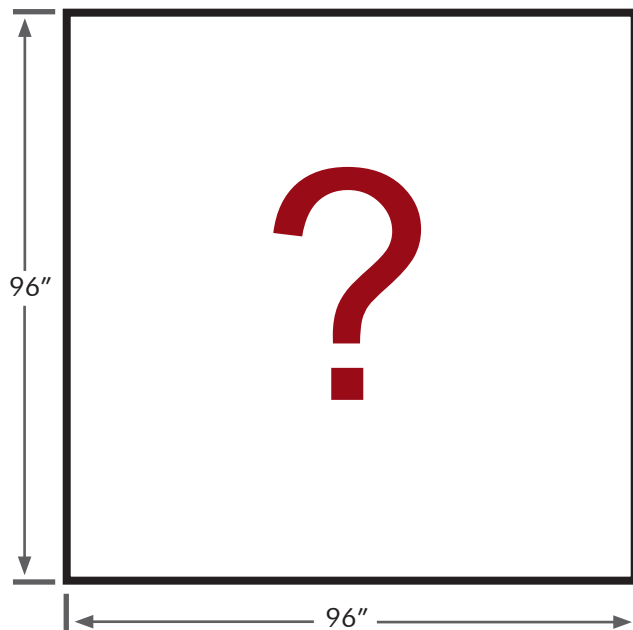
Before the competition, students are provided with a list of conditions and situations to prepare for (width of the robot's path, 30-degree ramps, line following, obstacle detection, ect). On the day of the competition, the student's programming knowledge and preparation are put to the test as they work to traverse the course in a limited amount of time. The robot that makes the most progress without stalling out or deviating from the course wins!

Ideas for Course Elements:

- Ramps (both up and down)
- Line Tracking
- Maze / Complex Path
- Obstacle Course
- Object Scoring

Suggested Materials:

- Black and red electrical tape
- Scissors (or cutting tool)
- Ruler (or straight edge)
- Tissue boxes for obstacles
- Wooden ramps (~18" wide)
- Wooden walls (~8" high)
- PVC piping for score posts
- Scoreable 3" play-pen balls



Possible Robot Behaviors to Prepare:

- Moving Straight (Autonomous)
- Precise Turning (Autonomous)
- Obstacle Detection (Autonomous)
- Line Following (Autonomous)
- Object Scoring (Autonomous & User Control)
- Remote Control (User Control)
- Ability to traverse ramps (Autonomous)

Additional Rules:

- All robots must start in a designated start zone.
- Physical contact with the robot as it traverses the course disqualifies that run.
- Participants may attempt as many runs on the course as time and the staff allow.
- The robot that traverses the course the furthest wins.
- If multiple robots complete the course, the fastest of them wins.
- Scoring an object, if applicable, can result in a staff-defined time reduction.