

IESL ROBOGAMES 2015

UNIVERSITY CATEGORY TASK SPECIFICATION

Eligibility

- Participants are advised to form a team of up to 5 undergraduates. Any number of teams from a university can enroll in the competition.
- All the team members should be undergraduates of same university at the time of their participation in the competition.
- Each team should provide valid identification document from the university on the competition day to prove the eligibility to participate in the competition.

Robot Specifications

- Dimensions of the robot must not exceed 25 cm × 20 cm (length × width).
- Robot must be completely built by the team itself with their own design ideas.
- Robot should have a clearly indicated "ON/OFF" or "START" switch.
- Once the robot is switched on, it should be self-navigating. Wireless communication and remote controlled robots are not allowed in the competition.
- No off-the-shelf kits are allowed except processing boards (ie. Arduino or equivalent, Raspberry Pi, etc.), sensor modules and drive gears. If you have any doubt, contact the organizing team.
- After starting an attempt, the only interaction of the participants with the robot should be starting and stopping if necessary. A penalty will be given for any other interaction with the robot.

- Robot must be wheeled and it should not cause any damage to the platform. Any robot with the potential threat of damaging the game platform will not be allowed to compete.
- Robots should work under any ambient light condition.
- *Task specific: The robot should have either an array of 7 segment displays or an LCD/OLED display to display the area readings (see Challenge).*

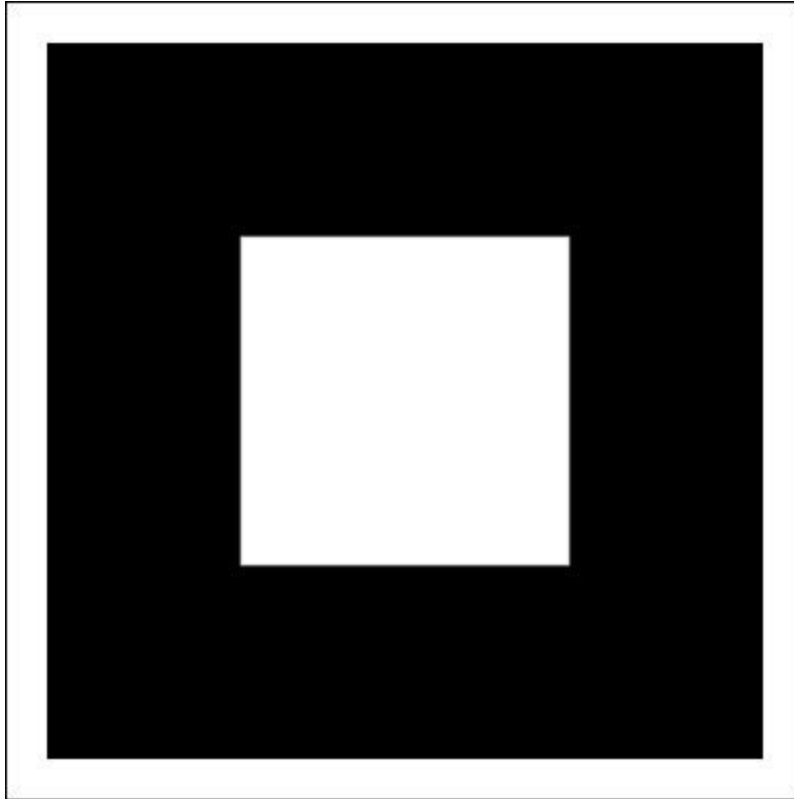
Platform

- Dimensions of the platform will be 8ft x 8ft. Please refer the view of platform.
- Surface of the platform will be black and matt finished. The white grid, area measurement subjects (triangles, rectangles) will be matte white. Thickness of the white lines will be 3 cm.
- There will be a clearance of at least 10 cm between any white line/white area and the edge of the platform.
- The platform will not be perfectly flat, so be ready to face little imperfections.

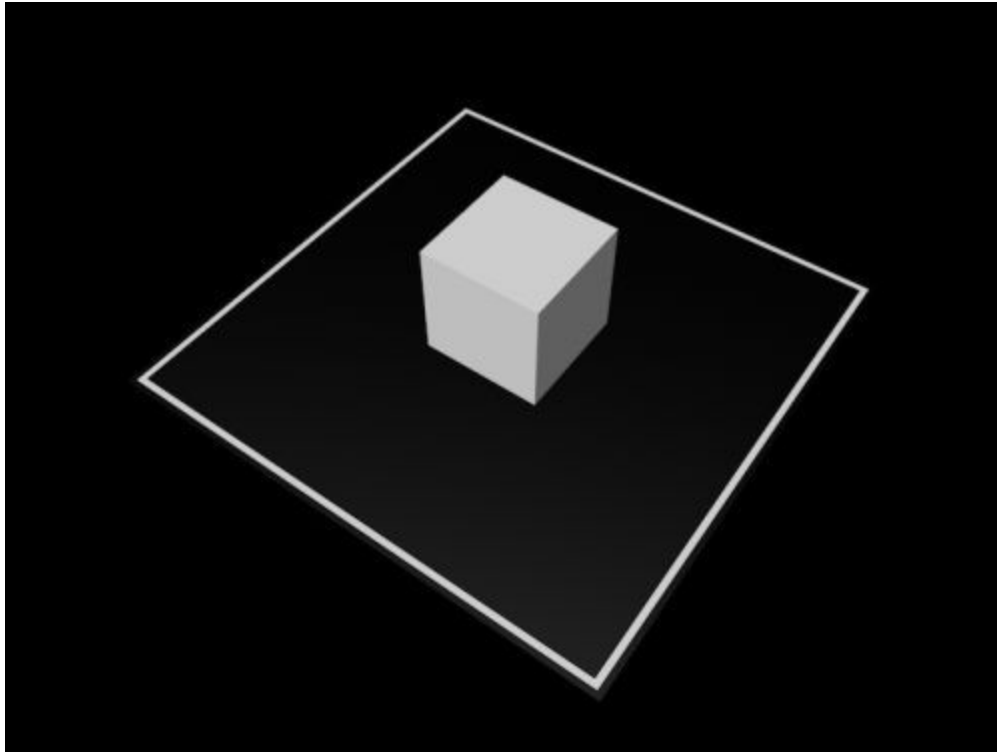
View of the platform

Show below are the views of the platforms when the object to be measure is a cuboid. Other objects include prisms.

Top View



3d View



Challenge

“This year’s Robogames University Challenge will be to build an autonomous robot that measures the volume of an object on the arena.”

Each robot is expected to measure the area of a single object placed at the center of the arena. The object will be either a right-angled triangle cross sectioned prism or a cuboid.

Arena Description

The arena will be marked with a white 2cm border. No object in the area will be placed less than 10cm close to the border.

Task Procedure

STEP 1: Choose the object randomly

The team will choose a number via a raffle. The corresponding object for the number will be placed at the center for the task.

STEP 2: Place the robot

The robot can be placed anywhere on the arena.

STEP 3: Start the task

The robot's start button is pressed and the robot should locate the object and measure its volume and then do a full stop and display the readings.

Start Point

- Teams are given the chance to place their robot at any point on the arena. Points awarded will depend on the position the robot is placed.

End Point

- There is no specific end point for the task. When the robot stops moving and stays still for 5 seconds the task is assumed to be finished.

Timing Measurements

- The task will be timed from the time the ON button of the robot is pressed to the time when the robot comes to a full stop. Timing will be compensated for the last 5 second which the robot is required to be still.



Details about shapes

There will be two types of objects,

- Cuboids
- Right angled prisms

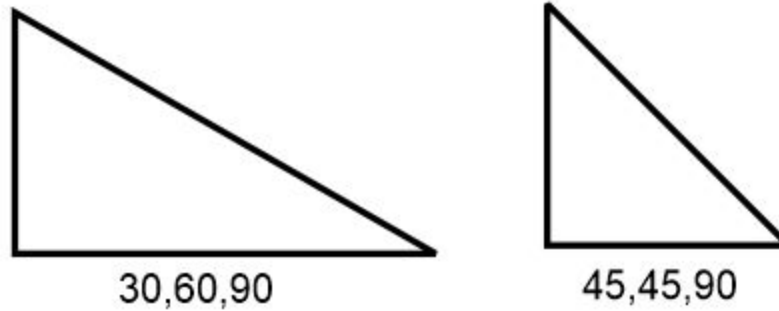
There will be two types of right angled Prisms,

- With acute angles of 45 degrees
- With acute angles of 30 and 60 degrees

Placement of the objects,

The objects will be placed with their cross-sections facing upwards. In the case of the prism the triangular cross section will face upwards as shown below.

Examples for prism cross sections



The shapes will have a maximum dimension of 100 cm and minimum of 30 cm (with a tolerance of 0.2cm).

The heights of the objects will range from 5cm to 20cm with a tolerance of 0.2cm.

The material for the shapes will be of the same material used for marking the lines (matte finished white surfaces)

Displaying the Measurements

- All measurements should be displayed in cm
- Use a LCD display or an array of 7 segment displays on the robot to display the measurements
- **Results should be displayed in cm³**