

## **OUSL ROBO MANIA 2012**

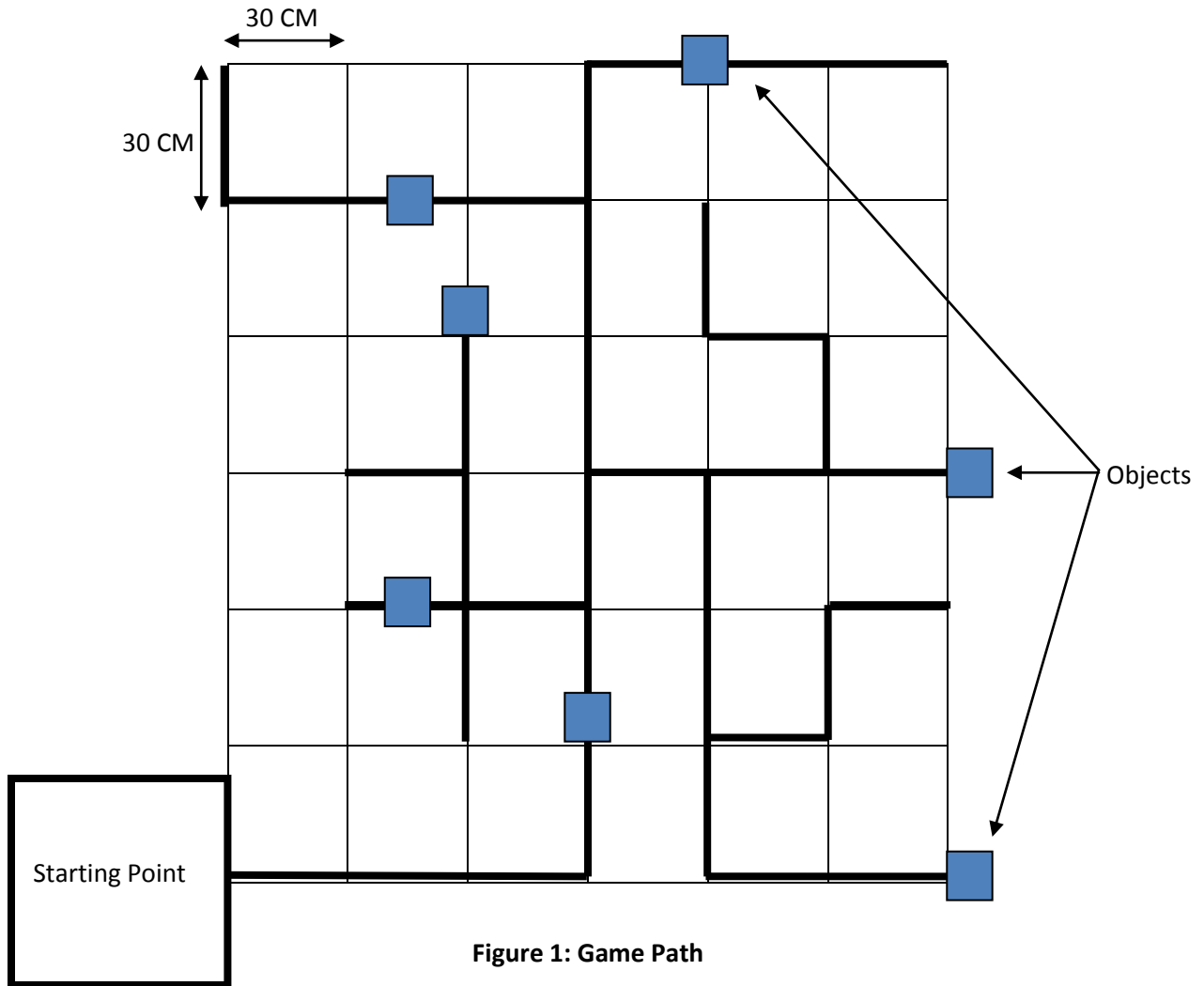
This competition is open for registered students of the Open University of Sri Lanka. Each team must comprise of minimum 2 members and maximum 3 members. The teams must design and build a robot that must navigate a playing field by collecting the objects on the path and following lines. The contest will consist of a preliminary round, in which 10 finalists will be selected, and the final round, in which certificates and a trophy will be awarded.

### **Robot Specifications**

1. The robot must conform to the maximum dimensions 25cm X 30 cm (width and length). Participants are free to decide the height of their robot.
2. It must be self-navigating, without the use of a remote control.
3. The robot may be wheeled, belt etc. However it should not be harmed to the playing field and the objects.
4. It must be designed and built by the competitors alone. No off-the shelf kits are allowed expect the following.
  - a. Drive gear (wheels, gear box. motor)
  - b. Sensor module (IR, Sonar, etc.)
5. The robot's power supply must be internal (no external power is allowed), and the voltage at any given point of the robot cannot exceed 24V.
6. It must include a start switch that will activate the robot, to be activated at the start of the contest. After the switch is turned on, no human interaction with the robot will be allowed until the end of the round.
7. The robot must be able to detect the objects, and detect and follow lines along the playing field.
8. The robot may be decorated in any way the team sees fit, as long as the maximum dimensions are not exceeded.
9. The robot should work under any ambient light conditions available in the play field.

## Playing Field/Tasks

The playing field is shown in below.



### Track:

Track will be a black color line which has 3cm width

### Objects:

Maximum object size must be 5cm X 5cm X 5cm and cube that not exceed 60 grams of weight

### **Task:**

- There will be 8 boxes on the track as shown in the figure1.
- Main task is to deposit all the eight boxes to the starting point. Robots can carry or push the objects.
- Boxes will be placed on the line as the center point of a box will align with the center of the line.
- Within 10 minutes the robot should replace all the boxes to the starting point.

### **Competition Rules**

1. Consists of 2 rounds
  - a. Preliminary round
  - b. Final battle
2. A 'Group Number' will be given to the teams in the order of their registration. After the preliminary round, teams will be allowed to make modifications to their robot for a period of 2 hours and at the end of the time the robot should be submitted to the steering committee.
3. Only one team member is allowed to handover the robot and once they place the robot in the displaying area they are not allowed to touch those robots. The Robot must be handed over 1 hour prior to starting time of the game and there will be no late submissions.
4. The order of the competitors will be decided randomly by the judging panel on the competition day itself
5. The Game time will be 10 minutes.
6. Extra time of 2 minutes (maximum) will be given for calibration prior to the competition.
7. One member of a group cannot represent any other group.

#### **8. Picking of Objects**

- (a) The robot may pick and collect all objects and then finally deposit all objects into the box on its return journey.

OR

- (b) The robot can pick one object at a time and deposit it into the box and return to the next one.

OR

- (c) The robot can push the object or objects to the starting point as well.

## 9. Weight of the object

The weight of the object may range from 20g to 60g. (The exact weight of the object will be provided during the workshop).

## 10. Finishing Journey

When the robot is on the return to its starting point the robot must stop exactly at the starting point or else marks will be deducted.

## 11. Grace or allowance for external errors

In case the robot gets stuck after picking one object then 3 attempts / chances will be provide with a conditional limit of a maximum of 10 minutes. If the 3 attempts / chances do not materialize within these 10 minutes then the robot will get disqualified from the competition.

## Scoring Criteria

Symbol	Description
AFLF	Average Forward Line Following (100 Points Maximum)
ABLF	Average Backward Line Following (100 Points Maximum)
OPF	Out of Playing Field Penalty (100 Points Maximum)
RST	Restart Penalty (100 Points Maximum)
GT	Game Time in seconds (Max 10 minutes)
COB	Collected Objects (10 Points for each collected object)
OCON	Overall Construction (100 Points Maximum)

$$\text{Total Score} = \{(AFLF) + (ABLF) - (OPF) - (RST) + (GT) + (COB) + (OCON)\}$$

References:

<http://www.sliit.lk/robofest/PDF/ROBOFEST-university.pdf>

<http://www.techcert.lk/robogames/>