



ROBO GOLF

Task

- Teams have to build an autonomous robot.
- The robot should have a built-in club to hit the golf ball.
- The decision-making should be autonomously accomplished using Image processing.
- An overhead camera (a standard webcam, specifications will be revealed later) fixed at the game arena should be used to grab images and process them for decision making.
- Laptops/Desktops may be used for image acquisition and processing.
- The communication between the laptop/desktop can be wired or wireless.
- The robot has to autonomously hit the ball into the hole with minimum number of strokes.
- A can consist of 4 members at max.

I. Robot Specifications:

1. Each team is allowed to have only one golfer robot.
2. The robot must fit into a cube of **250 mm x 250 mm x 250 mm (lxbxh)** at all times. It may not expand at any point during its run beyond these dimensions.
3. The max potential difference between any two points should not exceed 24 V.
4. The robot must be fully independent, with powering and motoring mechanisms self-contained.
5. The robotic equipment is to be fully autonomous. Human operators are not permitted to enter any information into the equipment during a run. The human operator should not directly control the motion of their robots with a joystick or by keyboard commands under any circumstances. However a laptop/Desktop used for image processing can autonomously send signals to the robot to control its motion.
6. Should have a built-in club for hitting the ball.
7. The use of a "tee" is not permitted.
8. The robot cannot be constructed using ready-made Lego kits or any ready-made mechanism.
9. Any microcontroller/microprocessor can be used to make the robot.
10. Any type of sensors can be used by the robot.

II. Laptop/Desktop Specifications:

1. Each team should bring their own laptops or desktops.
2. The laptops or desktops should in no way cause any hindrance to the gameplay.
3. Standard power source will be provided for laptops/desktops.
4. Any type and model of laptop/desktop can be used.

5. Any software or programming libraries can be used for image acquisition and processing using the provided over-head camera.
6. All methods of wired and wireless communication are allowed between the golfer robot and the computer.

III. Stipulations Related with the Game arena

1. The game arena will be a plane solid green coloured surface.
2. The dimensions of the arena will be 2mx1m (l x b).
3. There will be only one hole in the arena.
4. The arena will be fenced on all sides of the arena
5. The exact image from the over-head camera will be revealed later.
6. Refer to Annexure - 1 for schematic images of the arena.

IV. Referee and Technical Judgment

The entire event is divided into two phases: qualifying round and the final competition. The qualifying round and the final competition will be carried out by the organizing committee of the event. A Racing Executive Committee will be setup with subordinate technical group, referee group and arbitration committee to solve various issues encountered during the racing. The referee and technical judgment method should be determined by the organizing committee in accordance with the stipulations mentioned above.

V. Racing Rules for Qualifying round and the Final

Preliminary and the final competition use same golfing rules. Racing teams of each group will be ranked separately.

1. Rules for Preliminary Competition

- a) 15 minutes will be given to tune the parameters of the golfer robot and the image processing system.
- b) Each team will get 2 chances to hit the ball into the hole using single or multiple strokes.
- c) Each change will have a time limit of 2:00 minutes.
- d) Successful completion of the task will qualify the team into the final round.

2. Rules for Final Competition

- a) 10 minutes will be given to tune the parameters of the golfer robot and the image processing system.
- b) Teams will be playing golf using the knock out method.
- c) The robot with the least time to hit ball into the hole into the hole winning the round.
- d) Each finalist can only compete for one time.
- e) Score of the preliminary will not be included in score of the final; it is used only for selection and to determine participating order in final. Racing teams failing to participate or appear in time will be disqualified from the final.

Forbidden Behaviours:

- No auxiliary lighting equipment or other auxiliary sensors are allowed around the game arena;
- After entering the playing field, players cannot modify any hardware and software except for changing battery;

- Only referee and 2 player per team are allowed in the playing field;
- Any behaviour that might interfere with movement of the arena is not allowed;
- No copying is allowed in the algorithm and software used in the car. Software Used in the robot models of different teams of same university should be different clearly.

Inspection and Display:

- Before commencement of game, each team can test the game environment prior to the event, details of which will be announced later.
- During the racing, technical group of the organizing committee will perform technical inspection for all car models participating in the competition. In the event of any violations, the organizing committee is entitled to cancel qualification of corresponding team.

Miscellaneous:

- Game qualification will be cancelled for any other cheating behaviour during the competition;
- The rules should be interpreted by the organizing committee of the event.

Ball Specifications:

1. The balls would be red in colour.
2. The exact ball specifications in terms of weight and size will be revealed later. However, the ball will have a minimum diameter of 4 cm.

NOTE -

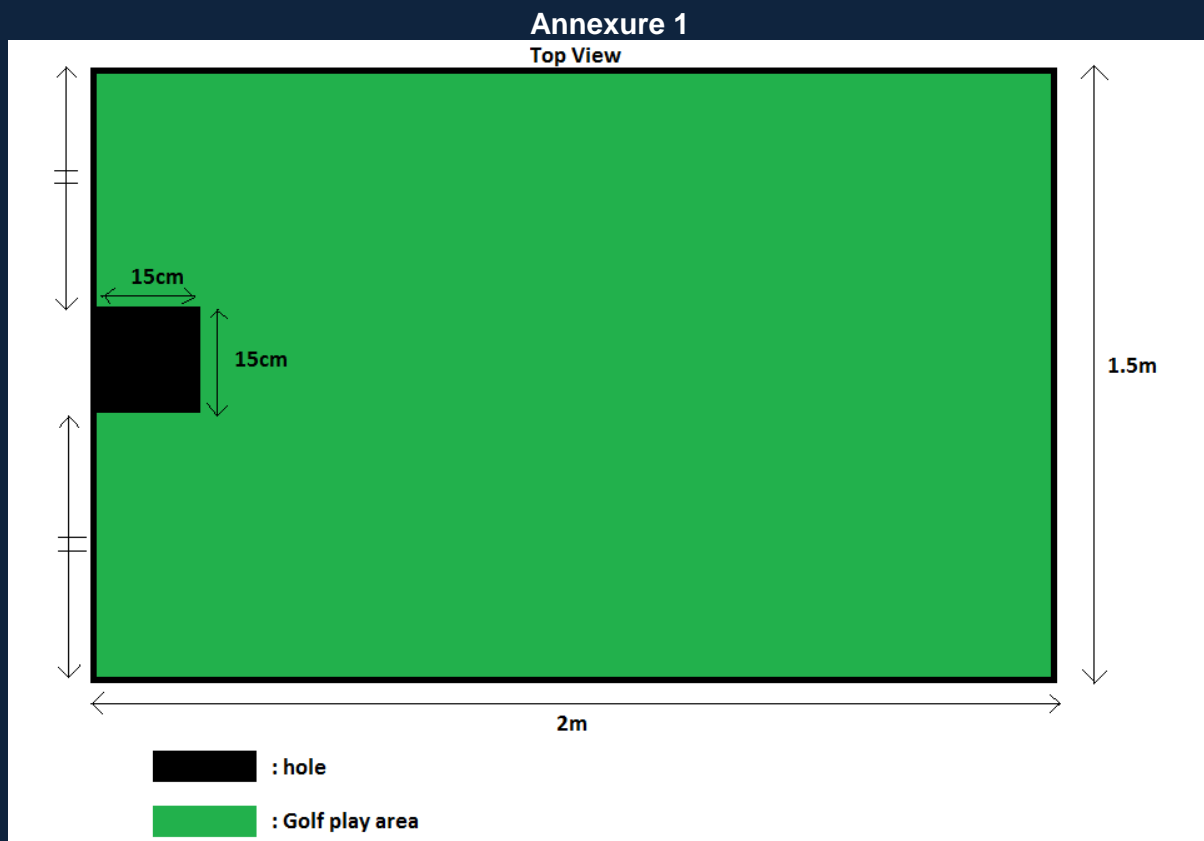
1. The colours of the arena and balls are subject to change. However, any changes made would be specified in bold on the site. So, you are advised to visit the site regularly for such changes.

2. Teams must come to the tournament prepared to calibrate their robots based on the lighting conditions at the venue. Every effort will be made by organisers to place the fields

in a way that the influence by external infrared light is as low as possible.

Camera Specifications:

The exact specifications of the webcam used will be revealed later.



***** The rules and conditions are subject to change by FLUXUS if necessary.
ROBOTICS CLUB, IITI reserves the right in their sole discretion to cancel, suspend
and/or modify The RoboGOLF at any time.***

Kunal Chaudhary
President, Robotics Club
+91-902-907-1191