ROBO SOCCER

INTRODUCTION:

The fight for the FIFA World Cup has begun. This time, it is just not a football game it is the battle to score a goal between the two great legends, Cristiano Ronaldo and Lionel Messi, who are against each other for the trophy, with their respective and best goalie to stop the goal. This time Effulgence presents you with the thrill of FIFA World Cup in the scopes of Robotics. One side, it is the bot Ronaldo with another bot as goalie, to face bot Messi, with his bot as goalie. Now, it is to be determined who is going to win the cup for the football tournament.

This event is a platform for participants to showcase their robotics talents and also to bring alive the football spirit.

TASK:

To build two manually controlled bots (striker and goal keeper), capable of playing soccer on an arena specially designed for robotic soccer match. The event is aimed at testing flipping and hitting of ball and bot control. The team with maximum goals at the completion of the match will emerge as the winner.

TEAM SPECIFICATIONS:

- A team can consist of a minimum of 3 and a maximum of six members.
- Students from different educational institutions can form a team.
- Participants must have a valid identity card of their respective educational institution.
- Teams can also use three cell lithium polymer or lithium ion batteries for power supply.
- Use of an IC engine in any form is not allowed.

BOT SPECIFICATIONS:

- Two bots have to be made for the soccer team. One bot will act as a goalie and the other bot will act as the attacker.
- Maximum allowable dimensions of each of the bot will be 35cm x 35cm x 35cm (l x w x h)
- The bot can be wired or wireless (preference to be given to wireless bot in case of a tie).
- The weight of each bot should not exceed five kg. It includes the weight of all external control devices.
- The speed of the motors used must not exceed 500 RPM.
- 12 V and 2 amp (max) DC supply will be provided to the teams during the event.
- The bot must in no condition trap the ball. So bots should not have any kind of grabbing mechanisms.

ARENA SPECIFICATIONS:

- The arena is similar to a soccer field with dimensions of 4m x 2.5m. Each half field is 2m long.
- Plastic (tennis) ball will be used.
- A center circle will be drawn on the field. It is 80 cm in diameter. It is a thin black marker line.
- In front of each goal there is a 60 cm wide and 120 cm long penalty area. A robot is considered inside the Penalty Area when it is completely inside.
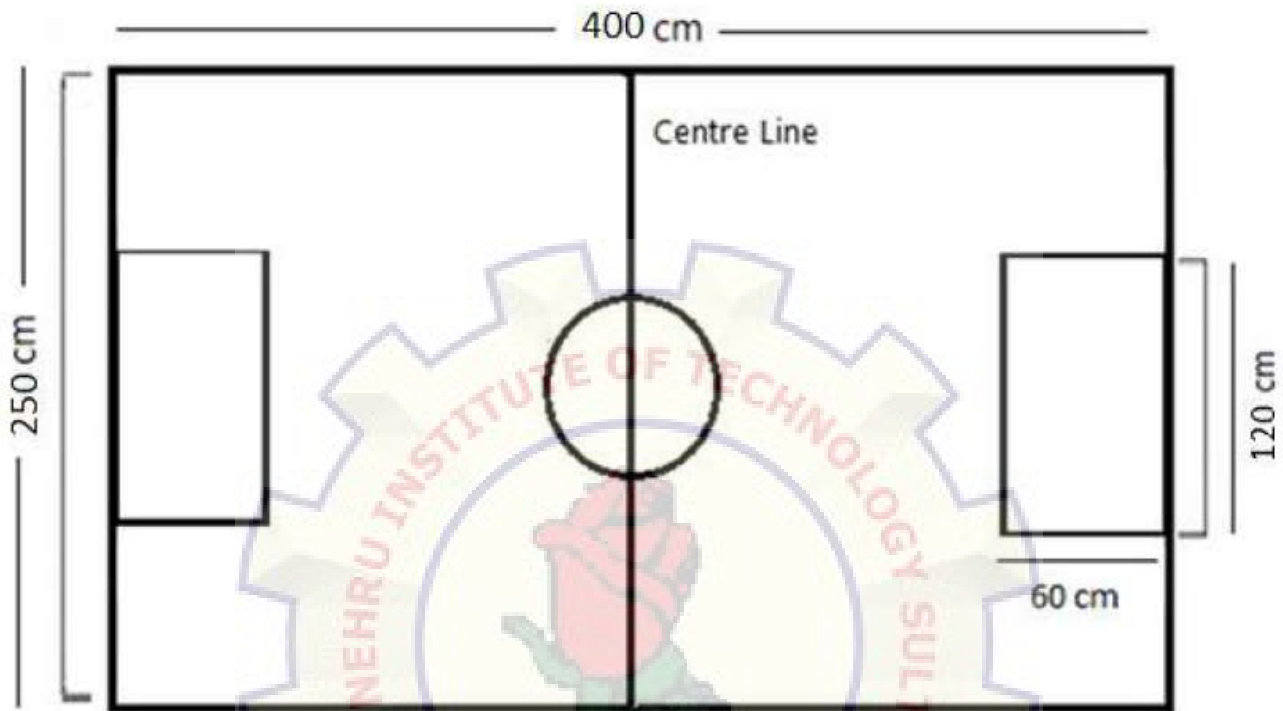- The goal post has the dimensions 100cm x 50cm x 50cm.

NOTE: The arena shown in the figure is only a sample version. Actual arena may differ slightly in dimensions from the one shown in figure.

ARENA : Robo Soccer

Area of arena: 400cm X 250cm
Goal Dimension: 100cm(width) X 50cm(height) X 50cm(depth)

GAME PLAY:

- Teams will have to play a football match against other team. Teams will be divided into pools details of which will be provided at the starting of event.
- 5 minutes of setup time will be provided to each team for pre-game setup and testing.
- Each match will consist of two halves of 4.5 minutes each.
- Ball will be placed at the centre of the arena at the starting of the match.
- At the start of the first half of the game, a referee will toss a coin. The team mentioned first in the draw shall call the coin. The winner of the toss can choose either which end to kick to, or to kick off first. The loser of the toss will settle for the other option. After the first half, teams will switch sides. The team not   kicking off in the first half of the game will kick off to begin the second half of the game.
- Each half of the game begins with a kick-off. All robots must be located on their own side of the field. All robots must be halted. The ball is positioned by a referee in the center of the field. The team kicking off places their robots on the field first. Robots cannot be placed nor remain behind the goal line or in the outer area. Robots cannot be repositioned once they have been placed. The team not kicking off will now place their robots on the defensive end of the field. On the referee's command all robots will be started immediately by each captain. Any robots that are started early will be removed by the referee from the field and treated as a damaged robot.
- A robot cannot hold a ball. Holding a ball means taking full control of the ball by removing all of its degrees of freedom. Examples for ball holding include fixing a ball to the robot's body, surrounding a ball using the robot's body to prevent access by others, encircling the ball or somehow trapping the ball with any part of the robot's body. If a ball stops rolling while a robot is moving or a ball does not rebound when rolled into a robot, it is a good indication that the ball is trapped.
- The robot moving first into the penalty area on a team's defending side completely (with every part of it) is designated as goalie until a part of it leaves the penalty area.
- Within the penalty area, the goalie has priority. Attacking robots are not supposed to push the goalie in any way. If the attacker and the goalie touch each other and at least one of them has physical contact with the ball, the ball will be moved to the nearest unoccupied neutral spot immediately. If a goal is scored as a result of this pushed-situation, it will not be granted.
- Lack of progress occurs if there is no progress in the gameplay for a reasonable period of time and the situation is not likely to change. Typical lack of progress situations are when the ball is stuck between robots, when there is no change in ball and robot's positions, or when the ball is beyond detection or reach capability of all robots on the field. After a visible and loud count, a referee will call "lack of progress" and will move the ball to the nearest unoccupied neutral spot. If this does not solve the lack of progress, the referee can move the ball to different neutral spots.
- If a robot's entire body moves out beyond the white line of the field completely, it will be called for
- being out of bounds. When this situation arises, the robot is given a one-minute penalty, and the team is
- asked to remove the robot from the field. There is no time stoppage for the game itself. The robot is
- allowed to return if a kickoff occurs before the penalty has elapsed.
- In principle, a game will not be stopped. A referee can stop the game if there is a situation on or around the field which the referee wants to discuss with an official of the tournament or if the ball malfunctions and a replacement is not readily available.

- In case of tie 3 min extra time will be given. The team to score first goal during the extra time will win the match. If no goal is scored during extra time, winner will be decided by penalty shoot outs during which 2 penalty shoots will be given to each team in turn. The better of two penalties will be considered to decide the winner.
- During Penalty shoots, only one bot (i.e. the striker) will be placed in arena and ball will be placed at the centre of the arena. The team to score a goal in lesser time will be considered winner.
- After the first half, goals will be swapped.

Scoring

A goal is scored when the ball strikes or touches the back wall of the goal. Goals scored either by an attacking or defending robot have the same end result: they give one goal to the team on the opposite side. After a goal, game will be restarted with a kick-off from the team who received the goal against. Before a kick-off, all damaged or out of-bounds robots are allowed to return to the playing field immediately if they are ready and fully functional.

Rules for Fouls

- Any kind of intentional damage caused to opponent team's bot will be considered as foul. Intentional grabbing of the ball so as to make it impossible for other team to get the control of the ball will also be considered as foul.
- A free kick will be given to other team in case of fouls during which bots of the team committing the foul will be freezed for 10 seconds and ball will be given to the other team.
- In case of repeated fouls yellow card and red cards will be given. If yellow card is given the bot will not be allowed to play rest of the match whereas the in case of red card it will not be allowed to play current as well as the next match.
- If a foul is committed inside the D-area, penalty will be given.
- Decision of the referee will be final and binding.

Penalty areas:

In front of each goal there is a 60 cm wide and 120 cm long penalty area. A robot is considered inside the Penalty Area when it is completely inside.

Disqualification

- Following cases will attract immediate disqualification:
- If a team fails to adhere to size specifications.
- If a team damages the arena in any way.
- If a team commits repeated fouls.
- If a team fails to report in time.
- If a team tries to intervene the gameplay without permission of the referee

GENERAL RULES:

1. Teams will have to report at least 15 minutes before thetime slot allotted to them at the beginning of the event, failing to do so may result in disqualification.
2. The team will be disqualified if its bot fails to fulfill the given bot specifications.
3. The team will be disqualified if its bot is found to be damaging the opponent team's bot or the arena.
4. The bot will be checked for the safety of the opponent's team and the arena, and would be disqualified if found unsafe.
5. LEGO kits or any other similar kits are not allowed.
6. Flying of bot using air foil, helium balloons, etc. is not allowed.
7. No last minute repairs will be allowed in the arena. However, each team can take a time-out of 2 minutes once during a match.
8. The organizers reserve the right to change any or all of the above rules as they deem fit. The decision of organizers will be final and binding on all.
9. Teams misbehaving with any of organizers will disqualified and in the case of any dispute decision of Event Head will be final.

CONTACTS:

Event co-ordinators:-

Raghav Singh(Final year)

Tapan Kesarwani(09389188185)
Email ID- tapan.kesarwani@yahoo.com

Pragati Gupta(07355171807)
Email ID- gahoipragati46@gmail.com