

Stage-1

Game analysis challenge

The problem statement of Abu robocon 2022 involves designing and building a robot that can do a specific task like in this event. There the theme was lagori which is also known as satoliya.



LAGORI-

Basically it is a game in which two team compete with each other. One team throws a ball at the seven stones or block to break it and then they have to stack them up again. While stacking up the blocks the other team have to grab the ball and hit any one player of the team who threw the ball

And they end up losing the match if they got hit.

There were certain rules too which the teams have to follow to be able to participate in the event.

Firstly the teams have analyse the problem statement and also analyse the field and the whole principle behind the game.



In this photo we can see two different fields on which the robots are tested. On the left side, we can see seven blocks stacked up. Which needs to be broken and then stacked up in certain time limit.

And on the right side, we can see four poles on the corner with a ball on top of each pole and some balls kept at one side of the field. The balls kept at the side is to be collected and brought to the spot and then the robot should aim the balls on the poles and shoot them so that the balls fell off.

Both of the fields required different pair of bots for maximum efficiency. Because there are two tasks in each of the game,

On the left side, one bot should be used to break the blocks and the other to stack them up. On the right side, one bot is meant to collect the balls and bring that to another robot which aims and shoots the balls on the pole.

Rules for the game-

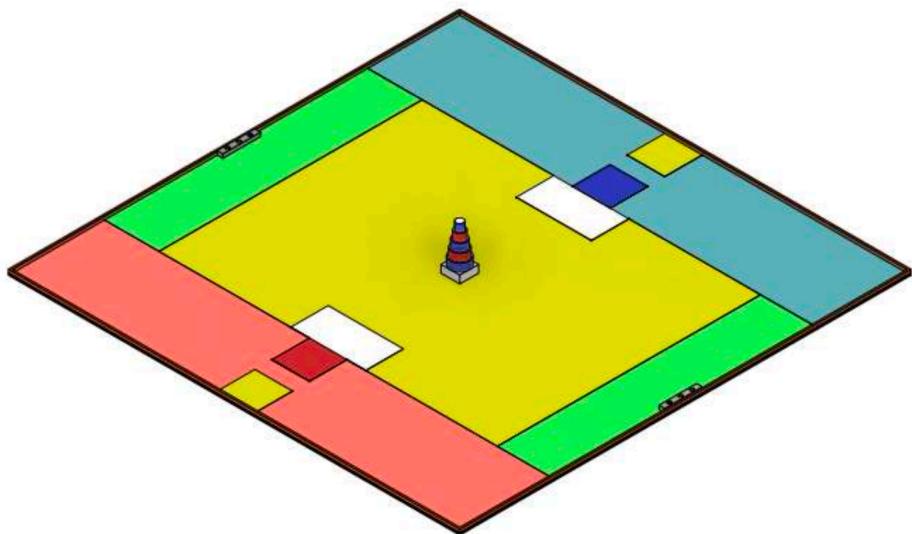


Fig. 2 Game Field (Perspective View)

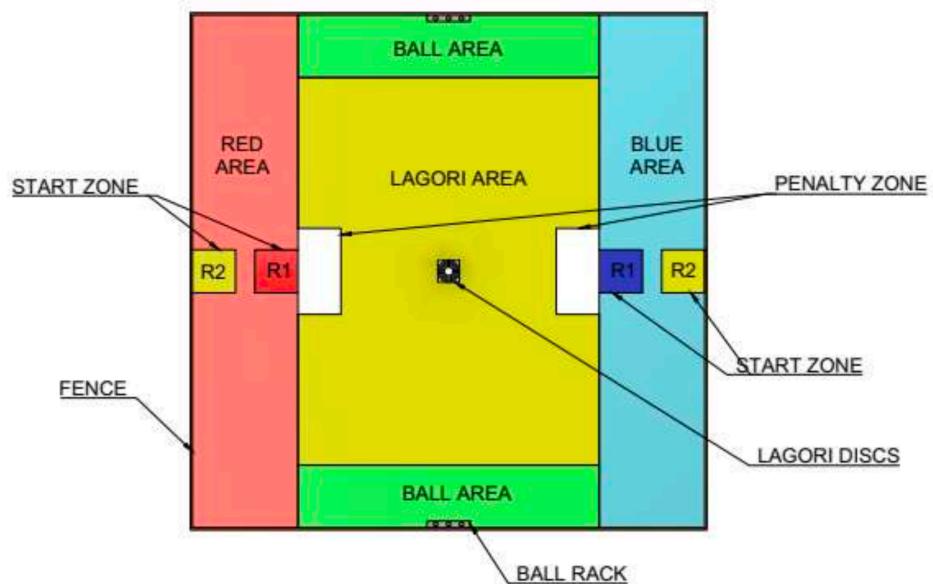


Fig. 1 Game Field and Its Function Areas

Each Round is 90 secs 2.1 Game Procedure

- ◆ Before the start of the game
 - Both teams place their robots in their start zone in the field before the Setting Time.
 - Referee will give the one-minute setting time before each Round starts.
Three team members and a maximum of three pit crews can start setting their robots.
 - Team members can load up to 3 Seeker Balls on the Seeker R1 during the setting time.
 - During the setting time, the team will set up the Ball on Head in the Seeker R2.

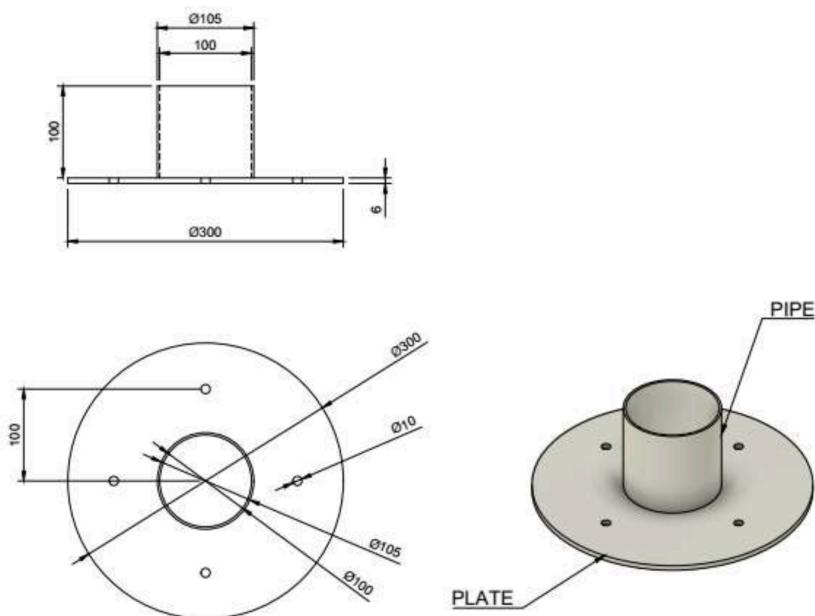


Fig. 3 Ball on Head

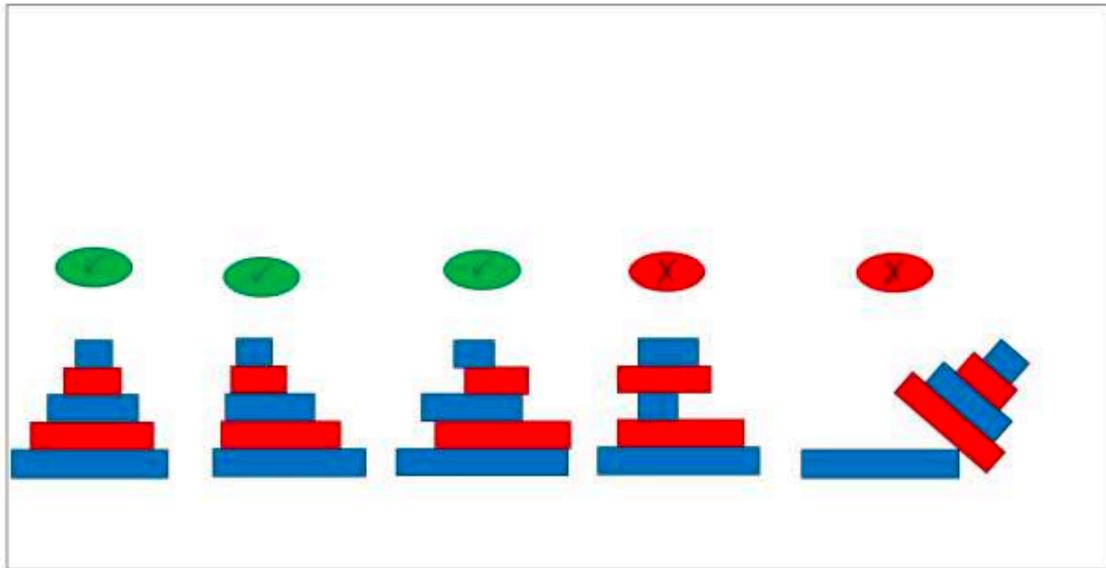


Fig. 4 Lagori Pile

- 2.1.5 If the team fails to complete the setting within the given time, the setting can be resumed after the start of the game. Once the setting is done, the team can start the robot with the referee's permission.
- 2.1.6 Before the game starts, R1 and R2 must be in their respective start zones, including the space above.

◆ During the game

When the Setting Time is over, the game will start with the start of Round 1.

- Team members must stay outside of the field except when the team members push start buttons of the Robots and retry.
- Team members must not touch Lagori during the game.
- Team members must not touch any ball except for a retry during the game.

- When Round 1 starts, Seeker R1 throws Seeker Balls to break the Lagori.

Seeker

The seeker will score points according to the number of broken Lagori discs.

Seeker can throw Seeker Balls up to 3 times during the Break Shot Time (30 seconds).

- When all 5 Lagori discs are broken or the Break Shot Time is finished, after the referee's signal, the Seeker R2 can start piling up the Lagori discs in the remaining time in the Round. The seeker will earn points according to the number of Lagori discs piled up.
- When all Lagori discs have been broken or the Break Shot Time is finished, after the referee's signal, Hitter's R1 and R2 can start moving to pick up the Hitter Balls
- Hitter R1 can throw the Hitter Balls at the Ball on Head of Seeker R2 to displace it. Hitter R2 can pick up Hitter Balls from the Ball Areas and pass them to Hitter R1. While passing from Hitter R2 to Hitter R1 the balls should not touch the field surface. Hitter R1 can throw the balls only when all of its contact surfaces with the field are in the R1SZ.
- Hitter R2 must displace the Ball on Head directly using a Hitter ball. If the Hitter Ball thrown by Hitter R1 does not hit the Ball on Head directly and the Ball on Head is displaced, the Hitter will be forced to retry and cannot restart for 15 seconds. The Seeker team members reset the Ball on Head immediately.
- A Round ends when one of the following conditions is fulfilled;

- 1 When Seeker finishes “Lagori Pile.”
- 2 The Hitter Ball displaces the Ball on Head of Seeker R2.
- 3 90 seconds have passed from the start of the Round.

When the 1st Round is over, the game will be suspended and both teams must move their robots quickly to their respective Start Zone. Then one minute Setting Time will start immediately. Blue Team which will be the next Seeker, can load up to 3 Seeker Balls to R1. After that, with the referee’s signal, the game will restart with Round 2.

The game will finish when the 2nd Round is over.