ROBOCON'18

Introduction:

Robocon is an international robotics event which is organized by ASIA-PASIFIC BRODCASTING UNION (ABU) every year. In this event more than 20 countries of Asia pacific region will be participating and will be sharing knowledge about robotics and similar interest area through interactions. ROBOCON'18 will be hosted by Vietnam in the month of August '18 i.e. after successful completion of initial rounds in all Asia Specific Countries. The contest theme is "**NEM CON: The Festival Wishing Happiness and Prosperity**".

In India, ROBOCON'18 was hosted by MIT Academy of Engineering, Pune at Balewadi Stadium, Pune from 1st to 3rd March, 2018. In this national event, 107 teams from various IITs, NITs and reputed institutions have participated. Following systems were developed by individual team participants as shown in figure-1:

1) Rack system for Shuttlecocks: To hold shuttlecocks rack system and to throw at specified target shuttlecocks are used.
2) Manual Robot: To pick up shuttlecocks from rack and pass them to Automatic Robot
3) Automatic Robot: To perform autonomous operations within arena as shown in Figure-2 to achieve targets in TZ1, TZ2 and TZ3.

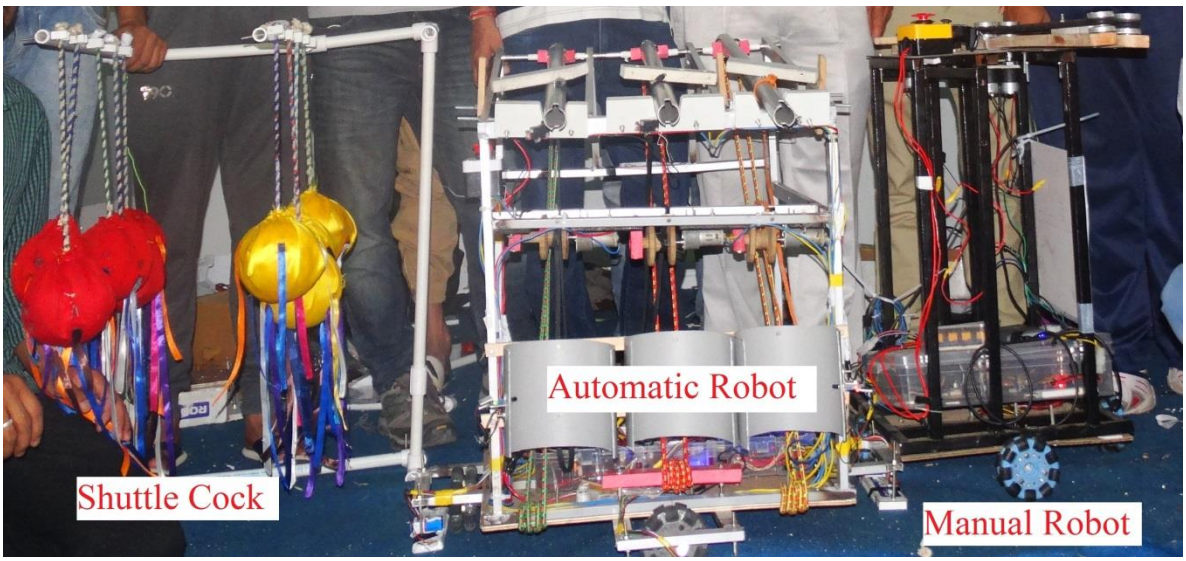

Figure 1 The Manual, Autonomous and Shuttle cocks for ROBOCON'18

Game field view of an Arena:

The objective of manual robot was to pick up shuttlecock from the loading zone (LZ) and pass it to the automatic robot from rack system. Automatic robot had to move to a specific location in arena, which were the throwing zone and thereafter throw shuttlecock, it must pass through the ring. There were three different targets to achieve from TZ1, TZ2, TZ3 as shown in Figure-2.

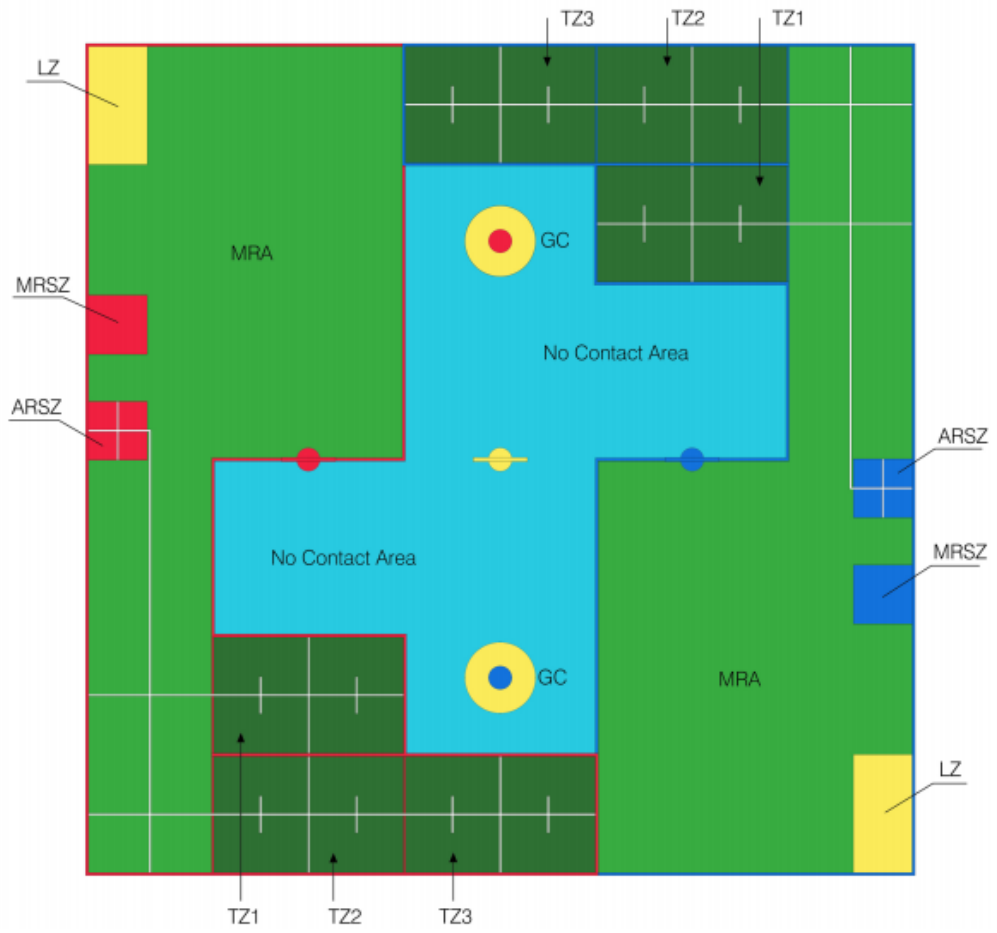

Figure 2 Game field top view

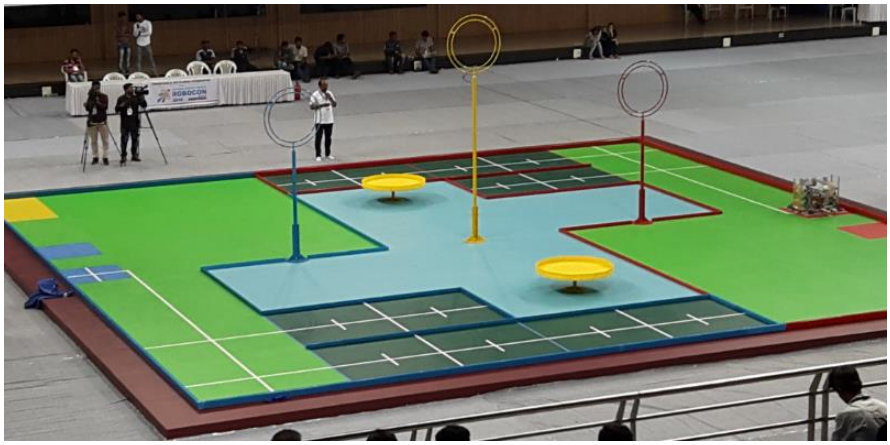

Figure 3 The actual arena of robocon'18 at Balewadi stadium, Pune

The autonomous robot was 4m and 6m away from the ring poles at TZ1 and TZ2 respectively. If the robot throws shuttle cocks from TZ1 & TZ2 successfully then it would be allowed to go for the TZ3 which was 6m away from the golden ring pole. If the shuttlecock successfully passes through the ring and if it drops in to the golden cup as shown in Figure 3, which is 4 meter behind the golden ring pole then it would be considered as '**RONGBAY**'.

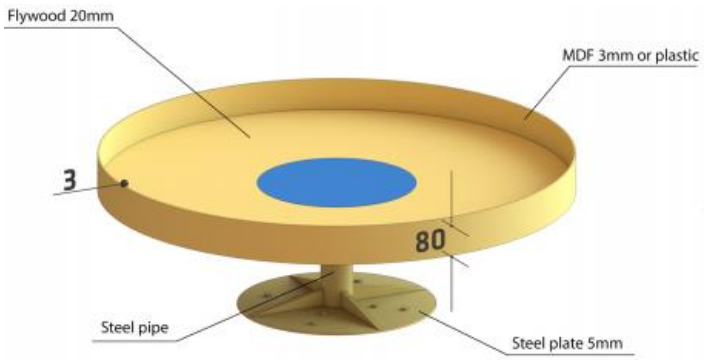

Figure 4 The Golden Cup

Robo System Development at ADIT:

Team of 4 faculty members and 14 students had developed both "Robo systems". There were number of alternatives, which were discussed among the team members like, use of cam – follower mechanism, conveyor belt mechanism, and mechanical grippers like fingers for loading the shuttlecock in the manual robot. Finally, Conveyor mechanism was used in manual robot to pick up shuttle cocks from the rack.

The initial results of developed autonomous system using pneumatics were not encouraging. Hence, the team members arrived at common inference of developing a catapult mechanism. The result of this autonomous system with line follower was satisfactory due to our previous year experience. The final refinement was carried out to make the system more accurate to meet the challenges. The time duration given to complete the game on the game field was only 3 minutes. The demo of the developed system was arranged on 26th February, 2018 at ADIT Foyer and it was successful.

The team had reached at Pune on 28th February, '18. Both the systems were assembled to participate for practice round before the event. During the practice match, it was observed that with high intensity flood lights the used pololu sensors were unable to differentiate the green and white back ground

of the arena. ADIT Robocon ’18 team had struggled a lot on both the nights to rectify the problems but couldn’t succeed. Other teams have used highly sophisticated LSA color sensors.

The main event was scheduled to start from 1st march and we have to play 2 league matches. First match was on 1st March against Walchand College of engineering, Sangli. ADIT had scored 2 points. Second match was on 2nd March with Nirma University, Ahmedabad and ADIT had scored 3 points. The final match was held between MIT, Pune and Nirma University, Ahmedabad. Nirma University, Ahmedabad won at the national level and will be representing India at Vietnam in August ’18.

Students have learned,

1. Aluminium base mechanical structure and welding techniques.
2. About PID controller and QTR-8RC line following sensor.
3. About “Cytron” motor drivers and L298N motor drivers.
4. Converting ideas into reality and foresighted vision to use latest technologies.
5. Communication with intellectual students of reputed organisations.

ADIT Team Robocon’18 at MIT Pune

Every member of Robocon Team ’18 had worked very hard to perform the best in the event. Though, team could not win but raised their knowledge in robotics. The ADIT Robocon Team is grateful to A.D. Patel institute of technology (ADIT) and Charutar Vidyamandal (CVM) for giving us such a great opportunity to perform at national level.

ADIT ROBOCON'18 Team members

No.	Designation	Name of student	Department
1	Faculty Coordinator	Dr. Yashvant D. Patel	Mechanical
2	Instructor	Prof. Ankit Sutha	Electronics & Communication
3	Instructor	Prof. Hiren Soni	Electronics & Communication
4	Instructor	Prof. Kalpesh Shah	Mechanical
5	Overall student Coordinator	Karan Vaghela	Mechanical
6	Technical Coordinator	Neel Dosani	Mechanical
7	Financial Coordinator	Vedant Rajput	Mechanical
8	Team Member	Het Bhhavsar	Mechanical
9	Team Member	Shivam mittal	Computer
10	Team Member	Vedant Rajput	Mechanical
11	Team Member	Shiv Panchal	Electronics & Communication
12	Team Member	Sahil Vohra	Mechanical
13	Team Member	Prit Patel	Mechanical
14	Team Member	Bhoomit Macwan	Mechanical
15	Team Member	Harshil Bhuva	Mechanical
16	Team Member	Naigam Bhatt	Mechanical
17	Team Member	Vikas Yadav	Mechanical
18	Team Member	Pranav Parekh	Mechanical