

NATIONAL JUNIOR ROBOTICS AT TECHFEST, IIT BOMBAY



Techfest is the annual science and technology festival of Indian Institute of Technology Bombay. Techfest is known for hosting a variety of events that include competitions, exhibitions, lectures as well as workshops.

It was one such competition I took part in, which was the National Jr. Robotics premier league organized by the Techfest and Robokidz llp on the 26th, 27th & 28th of December 2015. The theme for this year was to build a prototype of a bot that would clean the Indian waterways. The task was to pick up balls with a mechanized structure and place it in bins situated on opposite corners of the pool and score maximum points within a time limit of 3 minutes. In this, there were two categories: wired (controlled with remote [grades 5-8]) and wireless (controlled with android phone [grades 8-12]). I took part in both these events.

On the first day there was the first qualification round where I got to get a sense of the different bots and the opportunity to gauge my opponents. After the registration there was a practice session to get familiarized with the arena and the controls. After the qualifying rounds I was the second highest scorer in the wireless category with a total of 170 points where the cutoff was 20 points. On the 27th we had the 2nd round of qualifiers and I successfully made it to the quarter final with total points of 150 where the cutoff was 80.

In wired category I had a direct entry to quarter finals as I had won the Pune zonals. Post lunch, the quarter finals started for both categories where the competition got more and more challenging. From the 12 that got selected in the qualifiers only 4

would make it to the semi finals. In the wired category I got 220 points and in wireless I got 200 which were enough for me to move on in both categories to the semi finals.

In the semi finals I did very well in the wired category scoring 330 points and was the highest scorer in the entire competition which moved me on to the finals. However in the wireless category I was only able to score 190 points and finished off at fourth place.

In the finals I played against a friend from the same robotics class that I attend. He played first scoring 210 and I won the wired category with a score of 250 points. Shortly after, the award ceremony took place where I received a framed certificate and a cash prize.

The mechanism I used for building the bot was quite simple although complex at the same time. I used old coke bottles as the floating structure. The working of the wireless bot is a little more complicated as commands were given through an android phone. For this I had to use the Atmega 8 header board by atmel, atmel 20 pin IC, Bluetooth header board with Bluetooth chip, l293d motor driver IC and many more electric components. The programming was done with software called Bascom-Avr by avr studios as an alternative to C++ and docklight for the chip configuration and command setting. I also used the app called Bluetooth RC for controlling. For the bot to move in all directions I have used paddles connected to DC motors which propel forward or backward. I have also used a dc motor to move the basket used to pick up the balls and a clever mechanism for convenience of picking up storing as well as dropping. For the wired category I have made a remote with DP/DT switches and cross connections powered by a lithium polymer battery.

Overall it was a really great and fun experience conducted at one of India's most prestigious competitions and I hope I participate and win in other such competitions as well.

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