Department of Computer Science & Engg.
Kanwal Rekhi Building
Indian Institute of Technology Bombay
Powai, Mumbai 400076 INDIA
Tel. : +91 22 25764986
email : support@e-yantra.org

IIT Bombay

e-yantra

Letter of Participation

This is to certify that Mustafa Juzar Bharmal, a student of Marwadi Education Foundation's Group of Institutions, Gujarat has participated in the **e-Yantra Robotics Competition (eYRC 2022-23)**.

He/She is a member of the team having the following team members:

1. Samir Karimbhai Jivani
2. Mustafa Juzar Bharmal
3. Dharmi Arvindbhai Javiya
4. Meet Bharatbhai Kalathiya

This team has participated in Delivery Bike theme.

_____
Prof. Kavi Arya
Principal Investigator, e-Yantra
Professor
Department of Computer Science and Engineering
Indian Institute of Technology Bombay

cb5cbf999028704884e8fe79a635ec8684ca7b4c

Certificate of Merit: awarded to finalist teams.
Certificate of Completion: awarded to teams for completing all the tasks of the competition.
Certificate of Participation: awarded to teams for partial completion of tasks in the competition.
Letter of Participation: awarded as an acknowledgement of participation on e-Yantra Letterhead.

Theme: *Delivery Bike*

Theme Description: In this theme, the team will develop a Self-Balancing Bike, which will deliver various items throughout the cityscape. The delivery order will be decided by the priority of the package, thus posing a challenge in path planning. While development, you will learn the basics of the Control System and LQR controller design. The main challenges faced in this theme will be:

- Balancing of 2-wheeled Delivery Bike
- Autonomous Navigation of Delivery Bike
- Pickup and delivery in the arena

Theme Learning: *Robot Simulation (CoppeliaSim), Control Systems, Euler-Lagrange Mechanics, Linear Quadratic Regulator, Lua Programming, Octave Programming, 3D Designing*

Team Learning: The team has been awarded **Level 4** in the e-Yantra Robotics Competition (eYRC).

This level indicates that the team was able to complete initial tasks (mostly Task 0, Task 1 and Task 2 out of the total 6 tasks)

Certificate Table

Certificate Level	Certificate Description
Level 1	Certificate of Merit
Level 2	Certificate of Completion
Level 3	Certificate of Participation
Level 4	Letter of Participation

*level 1 > level 2 > level 3 > level 4