



eYantra

Engineering a better tomorrow

ERTS Lab  
Department of Computer Science and Engineering  
Indian Institute of Technology Bombay,  
Powai, Mumbai-400 076.



## Certificate of Completion

This is to certify that [Jayesh Khalane](#), a student of [JSPM's Rajarshi Shahu College of Engineering, Maharashtra](#) has participated in the **e-Yantra Robotics Competition (eYRC 2023-24)**.

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

1. Jayesh Khalane
2. Kaustubh Kailas Khutal
3. Sumit Sudarshan Chavan

This team has successfully completed all the assigned tasks in [AstroTinker Bot](#) theme.

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



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## Theme: *AstroTinker Bot*

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**Theme Description:** In this theme, the teams built an AstroTinker Bot (AB) for deployment on an arena that abstracts a space station. The robot's brain is powered by an FPGA (Field Programmable Gate Array) that reads and processes the sensor data and controls the actuators. Challenges and learnings in this theme include building AB from scratch using an FPGA, understanding and implementing single-cycle RISC-V CPU design, and creating a hardware-software co-design using Verilog HDL to unveil the powerful parallel processing capabilities of FPGAs.

**Theme Learning:** *FPGA, Verilog HDL, Build-a-Bot, RISC-V CPU Design, Path Planner in C, Component Interfacing, Serial Communication*

**Team Learning:** The team has been awarded **Level 2** in the e-Yantra Robotics Competition (eYRC).

*This level indicates that the team was able to demonstrate a clear understanding of the problem statement via a full implementation and was in top 10-30 ranked team in the competition*

**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*