



ATHARVA EDUCATIONAL TRUST'S  
**ATHARVA COLLEGE OF ENGINEERING**

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## **Report on e-Yantra Finale 2023-24**

**(Held on 22-03-2024)**

**Name of Event :-** e-Yantra Robotics Competition

**Date :-** 22<sup>nd</sup> March 2024

**Venue :-** Indian Institute of Technology-Bombay (IIT-B)

**No. of Participant Team :-** 460 teams

**No. of Team Members :-** 4 Members

**Team ID :-** eYRC#1470

## **About e-Yantra Robotics Competition**

**e-Yantra** is an initiative hosted in **IIT Bombay** (in CSE Dept.) to spread a wide variety of technical skills across colleges world-wide. Through our initiative, **Robotics Competition** (e-YRC), ([portal.e-yantra.org](http://portal.e-yantra.org)) we complement the existing education system with a "problem solving" culture through project-based learning.

e-YRC is a **7-8 months long** competition.

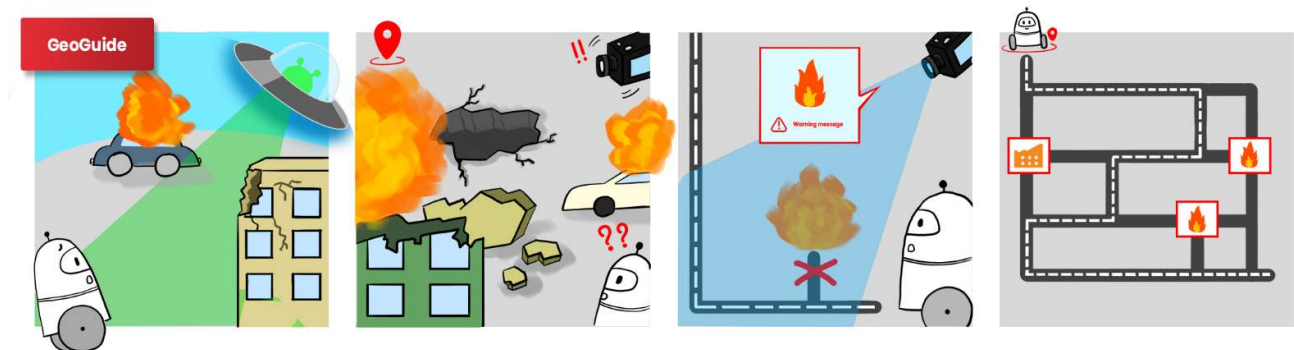
**It is divided into two stages:**

- Stage 1
- Stage 2

e-Yantra provides relevant resources, boilerplate codes, examples etc. along with each task besides expert technical guidance through Discussion Forum.

**Theme :- Geo Guide (GG)**

In e-YRC 2023-24, "Vanguard," a robotic vehicle, navigates a war-torn arena guided by Watchtower drone. Students construct Vanguard using ESP32 microcontroller, exploring image processing and machine learning.



**Implementation:** Software + Hardware

**System Requirements:**

**Operating System:** Ubuntu 22 /Windows 11

**Processor:** x64

**HDD or SSD Storage space:** 30GB or more

**RAM:** 8GB or more

## Team Members :-

| Sr. No | Name           | Roll No. | Branch/Year |
|--------|----------------|----------|-------------|
| 1.     | Akash Kolakkar | 60       | IT / 3      |
| 2.     | Parth Jain     | 49       | IT / 3      |
| 3.     | Anikesh Kulal  | 62       | IT / 3      |
| 4.     | Keshav Jha     | 51       | IT / 3      |

## Team Photo :-



## Participation Photo :-



## **About Project :-**

Vanguard, an autonomous robotic vehicle, was developed for the e-YRC 2023-24 competition under the theme "Geo Guide." This report outlines the implementation of Vanguard's propulsion system using ESP32 microcontroller, motors, drivers, Wi-Fi communication, and machine learning for image detection.

## **Working**

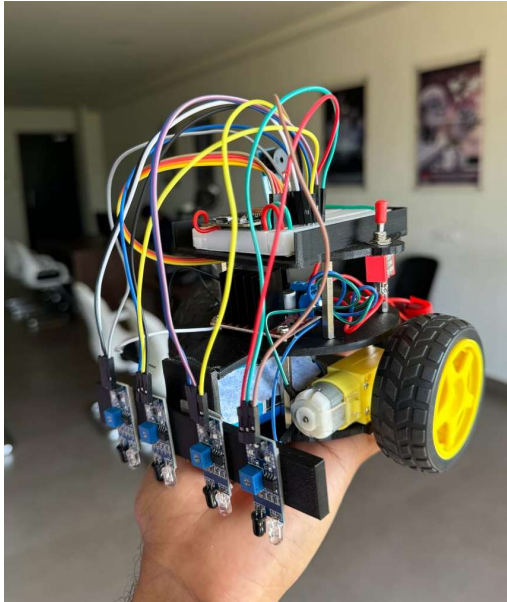
Vanguard, our autonomous robotic vehicle, is equipped with TensorFlow and Keras frameworks, enabling it to analyze images captured by the Watchtower drone. Leveraging a pre-trained EfficientNet B7 model, Vanguard can swiftly detect events, obstacles, and potential threats within the arena.

In the arena environment, five distinct events unfold. Using the Dijkstra algorithm, Vanguard determines the shortest path to navigate through these events. Once received via ESP32 Wi-Fi, Vanguard begins traversing the events in a predefined priority sequence, activating buzzers upon arrival at each event.

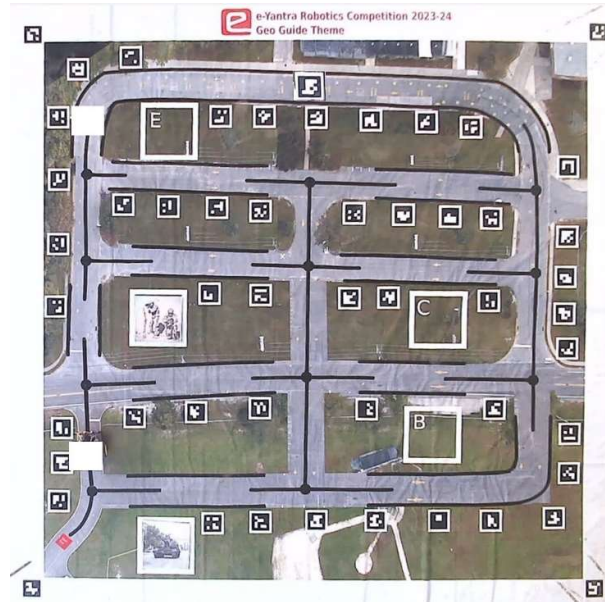
Scoring in the competition is based on Vanguard's proficiency in event detection, successful traversal of events, and its ability to return to the starting position. This integrated system highlights Vanguard's adaptability and strategic intelligence, essential traits in addressing dynamic real-world challenges.

## Project Photos

**Vanguard**



**Arena**



## Working Photo



## Certificates:-

