



**ST. VINCENT PALLOTTI**  
**COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR**  
(AN AUTONOMOUS INSTITUTION)

**eYantra**

**Engineering a Better Tomorrow**

An initiative by



**IIT BOMBAY**

## **Preface**

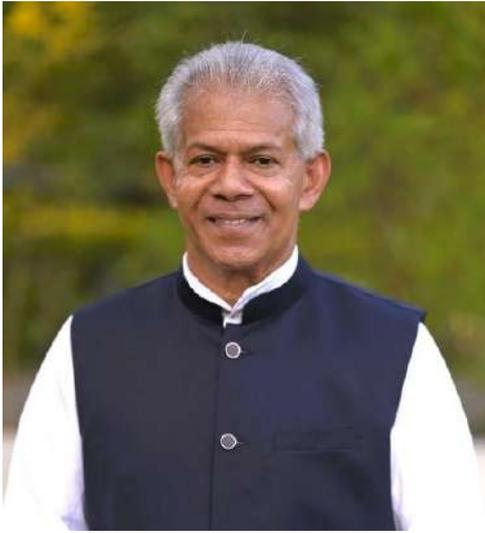
It gives us immense pleasure to present the magazine of **e-Yantra Lab** of *St. Vincent Pallotti College of Engineering and Technology, Nagpur*.

e-Yantra Lab activities provide opportunities for healthy competition but also cultivate skills in problem-solving, teamwork, leadership, and practical application of classroom knowledge. The diverse events inspire participants to explore new frontiers of technology while instilling confidence and a sense of achievement.

This magazine reflects the hard work, enthusiasm, and dedication of students from different branches . It serves as a record of the collective efforts put in to make this celebration of knowledge and innovation a grand success. We hope that the readers will find inspiration in its pages and carry forward the spirit of innovation and excellence that Technex embodies.

We extend our heartfelt appreciation to all contributors, faculty mentors, and students whose relentless efforts and support have made this event possible.

## From The Director' Desk



The establishment of e-Yantra laboratories, an initiative of the Indian Institute of Technology (IIT) Mumbai, to reach technology innovation to the engineering students across the country is a welcome one. Several thousands of students and hundreds of institutions have benefited by this. At St. Vincent Pallotti College of Engineering & Technology the e-Yantra lab was established in the year 2016 under the able leadership of Prof. Rohan Vaidya. Since then, more than 400 students have undergone rigorous training in Embedded systems, Internet of Things, Artificial Intelligence and Drone Technology. Several of them have patents and grants to their credit. Some of them even got absorbed into IIT Mumbai.

The e-Yantra lab serves as an excellent platform that drives innovation and experimentation. The students who work in the lab not only sharpen their technical skills, but also develop the spirit of discipline and team work.

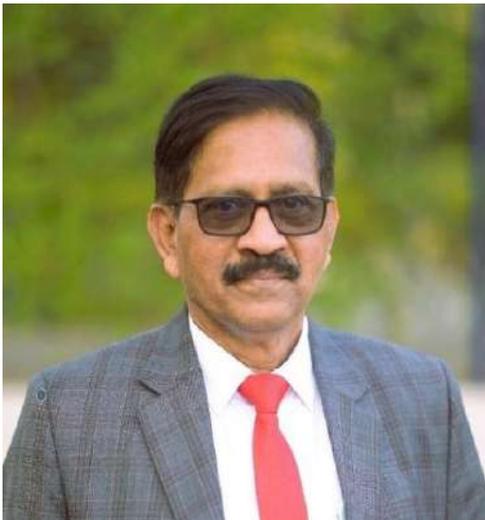
May e-yantra continue to train and nurture many more curious minds to dream big and to innovate.

Dr. Fr. Paul Chandrankunnel SAC

Director

SVP CET, Nagpur

## From The Principal's Desk



The e-Yantra Lab has truly become a hub for hands-on learning, where students are encouraged to turn their ideas into real-world solutions. Through collaborative projects and practical experience, they gain confidence and learn to tackle challenges in creative and meaningful ways.

In a world that's constantly evolving, it's essential for students to move beyond textbooks—to explore, experiment, and apply what they learn. Our lab provides the perfect environment for this kind of learning. Here, students work together, embrace setbacks as learning opportunities, and experience the excitement of building something that can make a difference. From developing solutions for urban flooding to creating smart healthcare devices, the projects featured in this magazine reflect both technical excellence and a deep sense of responsibility toward society.

I feel immense pride in every student and faculty member who contributes to this journey. Your curiosity, determination, and teamwork inspire us all. The lab stands as a shining example of what can be accomplished when knowledge, creativity, and support come together with a purpose.

Let's keep dreaming big, working together, and creating solutions that not only shape our careers but also enrich the lives of people around us.

Dr. Vijay M. Wadhai

Principal, SVP CET, Nagpur

## **Words of Inspiration – Founder, e-Yantra**

*" From learners to innovators*



*The e-Yantra lab at St. Vincent Pallotti College is an exemplar of what we aspire every lab to be. Under Prof. Rohan Vaidya's leadership and with strong management support, the lab has woven innovation into the very culture of the college. Students gain practical, hands-on skills that make them relevant to industry and higher education, leading to outstanding placements and admissions. Its impact is visible not only in the achievements of students but also in the talented alumni—like Ruchi Sharma, Isha Kamone, and Jaison Jose—who have gone on to strengthen e-Yantra itself. We wish the lab continued success and even greater achievements.*

*"*

**Dr. Kavi Arya  
Founder, e-Yantra,  
Professor, CSE Dept, IIT Bombay**

## Message from the Head of Department



I am delighted to highlight the remarkable contributions of the e-Yantra Lab at St. Vincent Pallotti College of Engineering & Technology, Nagpur for this academic session. Our department has always been dedicated to providing students with an environment that nurtures creativity, innovation, and practical learning, and the e-Yantra Lab stands as a shining example of this commitment.

The lab serves as a dynamic platform where students apply theoretical knowledge to real-world challenges, especially in areas like robotics, automation, IoT, and embedded systems. With access to modern equipment, expert guidance from faculty mentors, and opportunities to participate in national initiatives such as the MSME Idea Hackathon, our students are developing cutting-edge solutions that address societal problems—from improving urban infrastructure to enhancing healthcare services.

It is inspiring to see our students take ownership of projects, collaborate across disciplines, and push the boundaries of technology to create impactful solutions. The e-Yantra Lab has become more than just a learning center; it is a hub for experimentation, research, and leadership.

Dr. Harish Rajurkar  
Head of Department  
Electronics and telecommunication Engineering

## Message from the Faculty Coordinator



Our lab has always been committed to fostering innovation, practical learning, and problem-solving among students by providing hands-on experience in robotics, embedded systems, and the Internet of Things (IoT).

Through structured workshops, real-time projects, and participation in national-level competitions like eYIC, eYRC, MSME Idea Hackathon, our students have demonstrated exceptional creativity and technical expertise. We believe that learning by doing, exploring new technologies, and working in teams prepares students not only to meet academic requirements but also to become future-ready professionals.

The lab encourages interdisciplinary collaboration and empowers students to develop solutions for real-world problems, ranging from urban challenges like waterlogging to advanced healthcare innovations such as AI-powered diagnostic devices. With continued support from faculty mentors and industry partnerships, we aim to create a vibrant environment where innovation thrives and students transform ideas into impactful solutions.

I am proud of our students' achievements and look forward to seeing more pathbreaking projects that contribute to society and inspire others.

**Rohan Vaidya**  
Faculty Incharge,

# Student's Perspective



Only lab where I learned new technologies which are actually useful in industry. We had freedom to explore hardware and software concepts and make projects on it. We improved our communication skills while delivering lectures and workshops for juniors. We had multiple internship opportunities and secured high package job. It also inspired us to pursue higher studies. We have won several accolades in robotics and idea competitions

**Mr. Pravesh Bawangade**  
Founder & CTO , Yachthree Inc  
E&TC Dept, Batch 2019



e-Yantra shaped my career by giving me the skills and mindset to not just think outside the box, but break it when needed.

**Ms. Priyanka Jain**  
Traffic and Revenue Engineer,  
I-66 Express Mobility Partners,USA  
E&TC Dept, Batch 2020



E-Yantra Lab is a place where you put theory into practice. Its is a place where you solve problems through technology and innovation. E-yantra lab gave me a place to learn latest technology in a fun, practical environment. I loved being a member of E-yantra lab.

**Mr. Sarang Chouguley**

M.Sc. Student,  
Hof University of Applied Sciences, Germany  
Computer Engineering Dept, Batch 2021



The e-Yantra lab was the most influential aspect of my college life, helping me grow both as a well-rounded engineer and as a person. The projects, sessions, competitions, and learning experiences I had here were not only phenomenal but also a core reason for developing both my interpersonal and engineering skills. It was a true pleasure to be part of such a wonderful place, and if I ever got the chance again, I would happily relive the entire experience.

**Mr. Sankalp Singh**

AI Software Engineer, DTECT Technologies, Chennai  
Computer Engineering Dept, Batch 2022



Being a part of the e-Yantra Lab has been one of the most memorable experiences of my college journey. The late-night project work, endless brainstorming sessions, and being surrounded by passionate peers created an atmosphere full of excitement and learning. With the guidance of professors and constant support from seniors, I was able to connect mathematics and theory with real-world applications, which shaped not only my technical skills but also my confidence to pursue my passion for building things. The highlight was definitely the e-Yantra Robotics Competition, where teamwork, challenges, and late-night struggles transformed into valuable lessons of perseverance and innovation. What made the journey even more special was the opportunity to mentor juniors afterwards, sharing knowledge and keeping the spirit alive. Looking back, the e-Yantra Lab was not just a lab—it was a family, a gateway to robotics, and a place that truly shaped my career path and way of thinking.

**Mr. Jaison Jose**

Sr. Project Technical Assistant, e-Yantra, IIT Bombay  
E&TC Dept, Batch 2022



Being part of the e-Yantra Lab was a transformative experience that gave me exposure to solving real-life problems while working collectively with students from different departments and technical backgrounds. It not only enhanced my technical knowledge but also improved my communication, teamwork, and problem-solving skills. The lab created an enthusiastic environment and healthy competition among the students that motivated us to put in more effort, solve problems faster, and enjoy the process. This collaborative environment boosted my confidence and prepared me to take on challenges beyond college, making me more adaptable and ready for professional life.

**Ms. Sarrah Master**

Full Stack Developer, Amical Enterprises PVT LTD  
Computer Engineering Dept, Batch 2023



e-Yantra Lab is all about continuous learning and implementing it as well, helping us to have a broader perspective and gain hands on experience. You are never hesitant to apply your knowledge, a place where idea is executed. Improves not only technical skills but also interpersonal skills as well.

**Mr. Atharv Likhitkar**

MBA Students, Symboisis Intl. University, Pune

E&TC Dept, Batch 2023

**The e-Yantra Lab (Embedded System and Robotics Labs Initiative by IIT Bombay),** inauguration in August 2016, is a institute level platform which allow students from different branches of Engineering to Explore their abilities to walk extra mile, through activities like Training, Self Learning, Learn By Doing, Knowledge Transfer etc. in different technical domains of Engineering.

It aims at technical enhancement of students across the branches, with Focus on development of learning attitude, in different domains of Engineering like Robotics, Automation, Embedded system, Programming, IOT, Artificial Intelligence, Machine Learning , Product development etc.

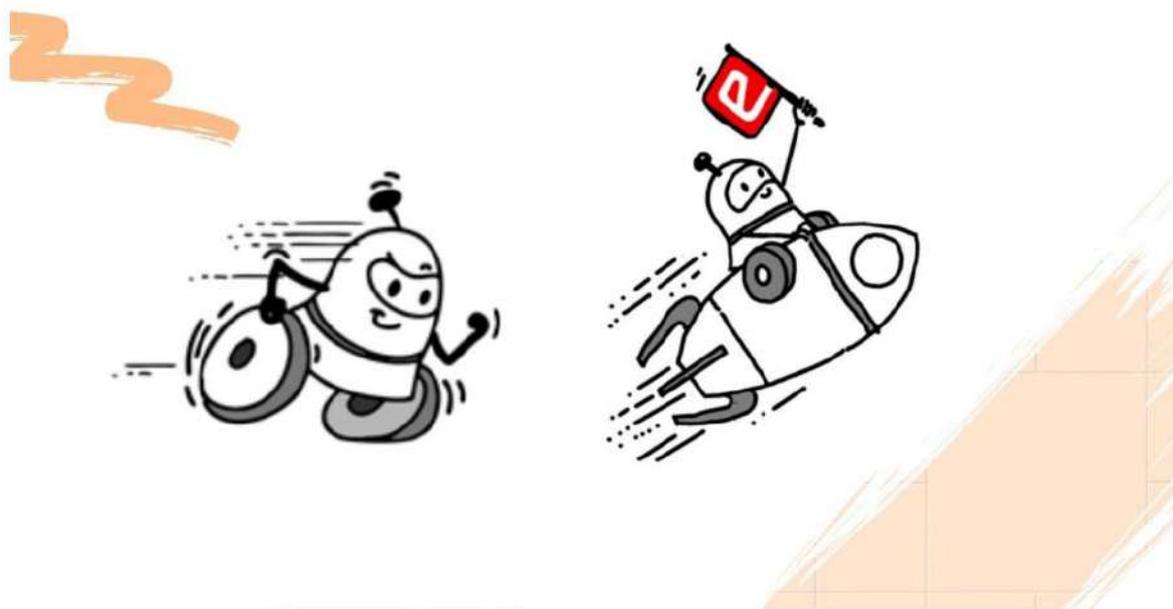
The faculty team guide students to learn latest technologies and provide them platform to have hands on experience through Task Based Training to explore real-world problem solving capabilities .

### **Objective:**

1. To develop self-learning skills in students by learn by doing activities.
2. To engage students in Project-based learning & problem solving activities to encourage creativity and initiative.
3. To create learning resources for project-based modules in a variety of courses.
4. To develop prototype/solutions for real time problems
5. To conduct outreach training programs for schools/Diploma/Engineering college students and for industry personals

### **Outcome**

1. Students can design and implement projects in field of Robotics, Automation, Embedded system, Machine Learning.
2. Activities carried out are helpful in getting internship and placement.



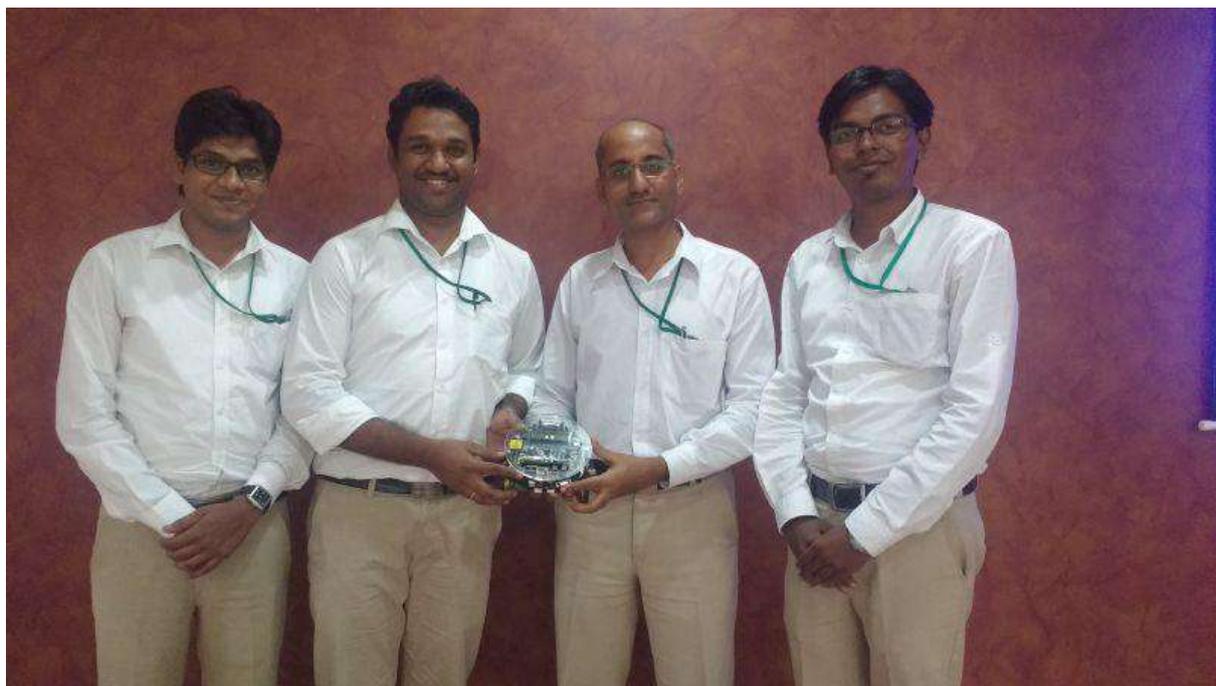
## **e-Yantra Lab Inauguration**

### **Embedded systems & Robotics Lab Setup at SVP CET**



**August 2016**

### **Faculty Team**



**Prof. Bhooshan Humane, Prof. Binu Joy, Prof. M. N. Kapse Prof. Rohan Vaidya From (L to R)**

## **e-Yantra Journey**

### **at St. Vincent Pallotti College of Engineering**

#### **eYRC 2012 competition**

In the year robotics competition 2012 students from E&TC department participated event and bagged 2<sup>nd</sup> position in final. The theme assigned for the batch was the “pothole detections”.

They were awarded with successful completion certificate from IIT Bombay.

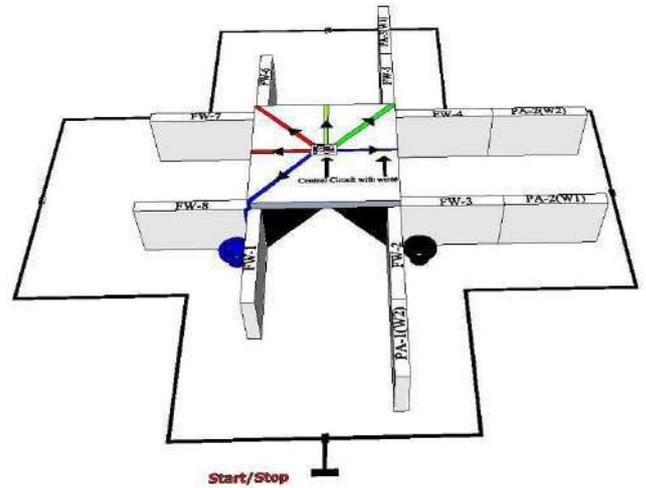
Participants: Vikram Gurve, Amogh Harde, Akshay Adgurwar (From L to R )

2012



## Participation in e-Yantra Robotics competition

2015



Participants: Priyanka Dabre, Samiksha Koche, Priya Banode & Anushree Bhojar (L to R) participated in e-yantra Challenge 2015.

Theme : Gas Leakage Detection

2016



Participants: Ravi Pande, Sushmit Santra, Sanket Thakre, & Justin Castelino (L to R) participated in e-yantra Challenge 2016.

Theme : Bothoven

## **e-Yantra Robotics Competition**

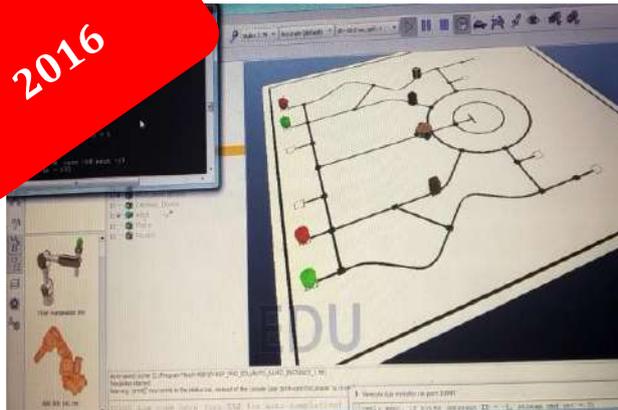
- ❖ **An Annual competition Organized by IITB**
- ❖ Real-world problem are implemented using the robot.
- ❖ **The winners of this competition are offered a 6 week paid summer internship at IITB through e-Yantra Summer Internship Program.**

Robotic kit  
worth Rs.  
40,000/-  
is given free  
for competition

An unique  
competition  
where student  
learn compete  
by learning

Provides **Video**  
**tutorials** to help  
them learn

2016



The e-Yantra Robotics Competition (eYRC) 2018 theme was "Nutty Squirrel," where students designed and built robots that mimicked a squirrel's behavior to collect, sort, and store nuts in different locations, utilizing concepts like path planning and embedded systems. The competition involved creating a robot with a lift mechanism to carry colored nuts, place them in designated deposit regions, and traverse obstacles using sensors and microcontrollers.

**Theme: Nutty Squirrel, Shortest Path Algorithm**



Students Participated in eYRC

2016



## Theme: Biped Petrol



Pre-Finalist

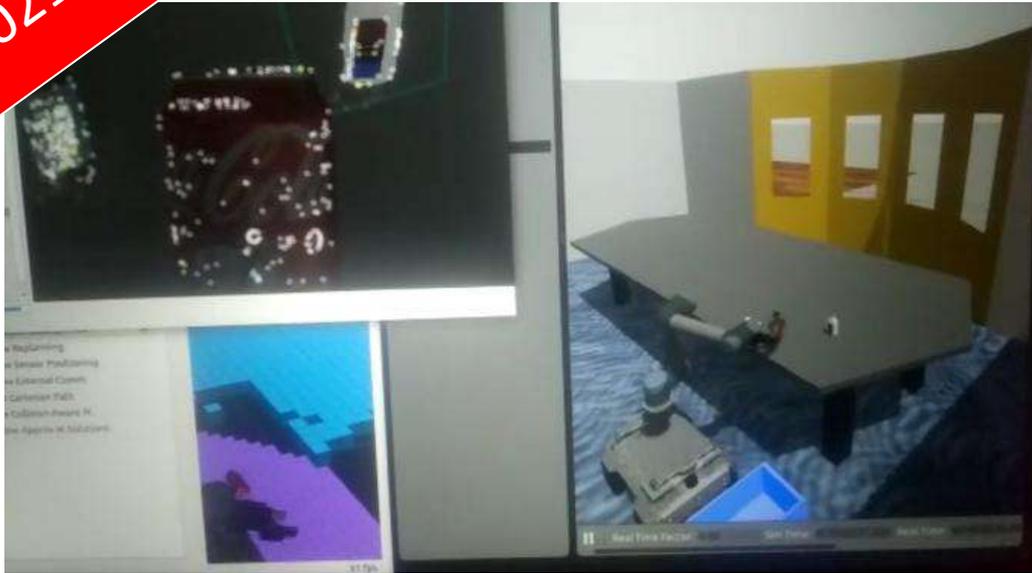
The "Biped Patrol" theme for the e-Yantra Robotics Competition (eYRC) in the 2019-20 season involved designing a two-wheeled, self-balancing robot to deliver medical supplies to crowded shelter camps during a disaster.

- **Robot Design:**

A two-wheeled, self-balancing robot that mimics the human challenge of balancing on two feet.

Participants: Priyanka Jain, Jaison Jose, David Tency and Sankalp Singh (CE Dept.) (L to R)

2021



## Theme: Sahayak Bot



Finalist ( AIR – 04 )

The eYRC theme "Sahayak Bot" was a robotics challenge where participants built an autonomous robot to assist in tasks, often involving navigation and manipulation in a simulated environment. It was a part of the [e-Yantra Robotics Competition](#) (eYRC), a competition organized by IIT Bombay.

- **Robotics Skills:**

The challenge required participants to develop skills in various robotics areas, including:

**ROS:** Working with ROS (Robot Operating System) for robot software development.

**Navigation:** Implementing mapping and navigation stacks to guide the robot through different locations.

**Manipulation:** Developing the ability to pick and place objects using a robot arm.

2024



**Theme:** Warehouse Drone(WD)

**Theme Description:**

The goal of this challenge is to navigate a drone through a warehouse, identifying packages placed at various locations within the warehouse. The warehouse will contain multiple aisles where packages are stored. Participants must use an overhead camera to map the warehouse layout and develop path planning algorithms to move the drone from one point to another. They will be tasked with identifying a specific package and navigating the drone to scan it.

**Team Members:**

Atharva Naitam ( CE )

Atharva Bhede ( CE )

Atharva Kadu ( IIoT )

Nevin Oommen ( CE )

# e-Yantra Idea Challenge

## Objective:

The eYIC aims to foster innovation and problem-solving skills among students by encouraging them to develop solutions for real-world challenges using embedded systems and robotics.

## Eligibility

Open to all Engineering, Science, and Polytechnic students. Teams can consist of 2–4 members, with or without a mentor. A team, including the mentor, can have up to 5 members. [eyic.e-yantra.org](http://eyic.e-yantra.org)

## Competition Format

1. Team Formation: Assemble a team of 2–4 students, with or without a mentor.
2. Problem Selection: Choose a problem statement from the provided list.
3. Solution Development: Design and develop a prototype solution.
4. Submission: Submit the project along with documentation and a video demonstration.
5. Evaluation: Projects are evaluated based on innovation, technical complexity, and impact.

## Benefits

- Certificates for participants and mentors.
- Recognition at national level.
- Opportunities for internships and collaborations.
- Exposure to industry experts and academicians.

2019

### Monitoring & Notification System Using Internet Of Things



### Automatic saline monitoring, controlling and notification system using internet of things

(national final)

This system is a healthcare innovation startup focused on transforming the way intravenous (IV) therapy is monitored and managed. Our smart saline monitoring system ensures real-time tracking of fluid levels, prevents reverse blood flow, and automates bottle switching—enhancing patient safety and easing the workload for medical staff. The system brings intelligent, IoT-driven solutions to the frontline of patient care



### Street Light Monitoring System (Regional Final)

**Problem Statement:** The inefficiencies of traditional street lighting systems result in high energy consumption, higher operating expenses, and slower maintenance responses. Lights are frequently run at maximum capacity regardless of actual demand due to these systems' frequent lack of adaptive control and real-time monitoring, which increases carbon emissions and wastes energy

#### **Solution:**

- Solution: Real-time monitoring: Constant gathering of information on environmental conditions and street light performance to enable well-informed operations.
- Adaptive control: Up to 40% more energy efficiency is achieved by automatically adjusting lighting according to preset schedules and ambient light levels.
- Cloud-based dashboard: An intuitive user interface for system control, performance analytics, and remote management.
- Alerts for proactive maintenance: prompt identification and reporting of malfunctions or performance problems in order to minimize downtime.

2020



## Anti-Drowning Device with Automatic Rescue System

(National Final)

**Participants:** Priyanka jain  
Susan Sajji  
Prajwal Pimpalkar  
Akshay Wararkar

### Objective of the project

#### 1. Addressing Drowning Incidents:

Drowning is a leading cause of unintentional death globally, especially among children and aquatic workers. Current safety measures, such as lifeguards or cameras, are reactive and often miss early signs of distress.

#### 2. Development of Smart Wearable Safety System:

This project proposes the design and deployment of DrownGuard—a wearable IoT-based device equipped with sensors and an AI model to detect early symptoms of drowning and trigger a built-in flotation system.

#### 3. Proactive Life-Saving Mechanism:

The main objective is to develop a system that autonomously initiates a rescue response and sends alerts to monitoring personnel, improving response time and increasing chances of survival during aquatic emergencies.



## Pollution Check

(Regional Final)

2021



## **Warning system for vehicles to avoid drowning in waterlogged roads**

**Gold Medal ( AIR - 1 )**

### **Problem Statement**

Urban areas face significant traffic congestion issues, which increase travel times, fuel consumption, and greenhouse gas emissions. These issues impact both environmental sustainability and the quality of urban life. There is a need for an intelligent system that can monitor and analyze traffic patterns in real-time, enabling dynamic management of traffic flows to reduce congestion and support sustainable transportation.

### **Proposed Solution**

Our proposed system uses IoT sensors, data analytics, and machine learning to monitor real-time traffic conditions. IoT sensors (infrared, ultrasonic, and cameras) gather data on vehicle counts, speeds, and wait times at key intersections. This data is transmitted to a central server through Wi-Fi, LoRa WAN, or 4G/5G communication. Edge devices, like the ESP32 Dev Kit, handle initial data processing to reduce network load. In the cloud, machine learning algorithms analyze traffic patterns, detect congestion, and predict future congestion trends. A central dashboard provides real-time visualization for traffic authorities, while a mobile app or web interface guides drivers with optimized route suggestions.



## **Cattle Rescuer**

**Gold Medal ( AIR - 1 )**



Manhole indication and accident prevention system

Silver Medal (AIR - 2)



**Winners**

2022



## Automated Greenhouse farming system

Best presentation

### Objective :

Traditional greenhouse farming often faces challenges such as labor-intensive tasks, resource inefficiency, and environmental vulnerabilities. Our Automated Greenhouse Farming System offers a comprehensive solution to these problems.

Automated greenhouse farming optimizes crop production by controlling environmental factors, automating tasks, and using data analytics. This improves efficiency, sustainability, and profitability while ensuring high-quality produce.

## Internship at e-Yantra,IIT, Bombay

2019-20



**Ms. Ruchi Sharma**



**Ms. Isha Kamone**

2020-21



**Mr. Jaison Jose**



**Mr. Akshay Wararkar**

**Recruited at e-Yantra,IIT, Bombay  
As Project Assistant**

**2019-20**



**Ms. Ruchi Sharma**



**Ms. Isha Kamone**

**2020-21**



**Mr. Jaison Jose**

## eLSI Hackathon 2024

The overarching theme of this hackathon is "Automate Your e-Yantra Lab" Team of 4 Students Secure 1st position organized by IITB in April 2024



Dyandev Sawarkar 4<sup>th</sup> ET dept.

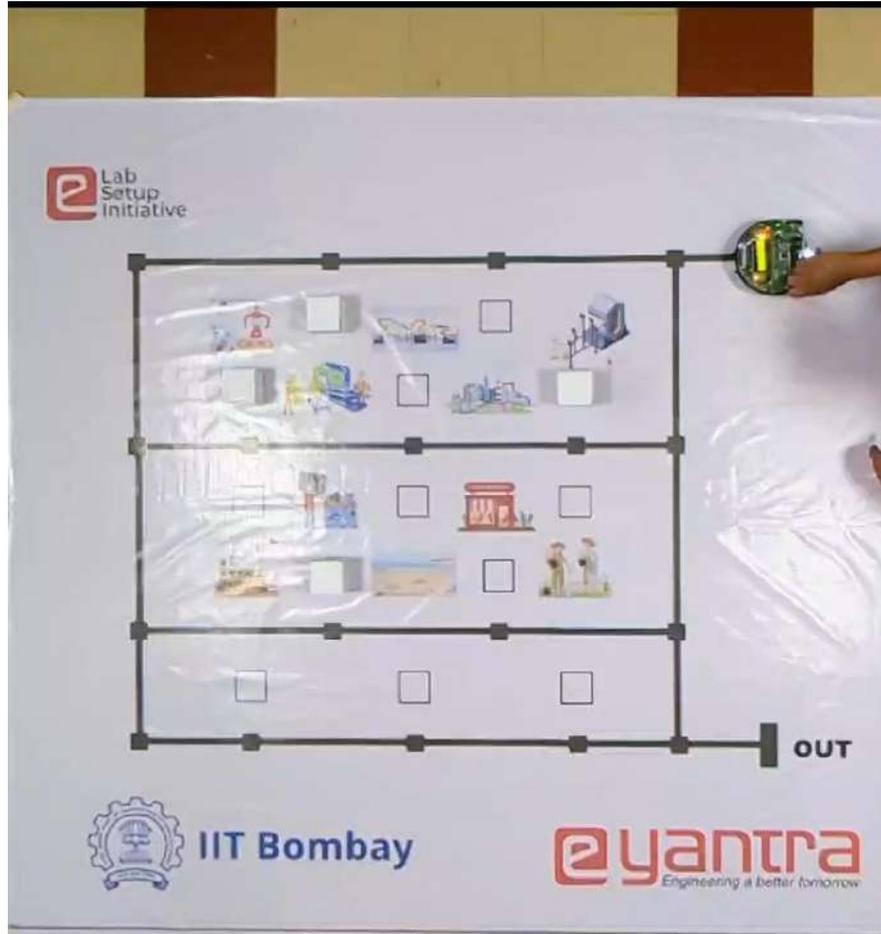
Parth Talmale 3<sup>rd</sup> ET dept.

Swayam Kamble 2<sup>nd</sup> IIOT Dept

Nehesh Sawarkar 2<sup>nd</sup> IT Dept.

## e-Yantra Teacher Challenge

Teacher team from SVP CET participated and won Regional round in Aug, 2024



TechFusion 2024: Grand Finale

At SVP CET, nagpur

## Patent Granted



AUTOMATIC SALINE MONITORING, CONTROLLING AND NOTIFICATION SYSTEM USING INTERNET OF THINGS

Patent No. 512677, Feb, 2024



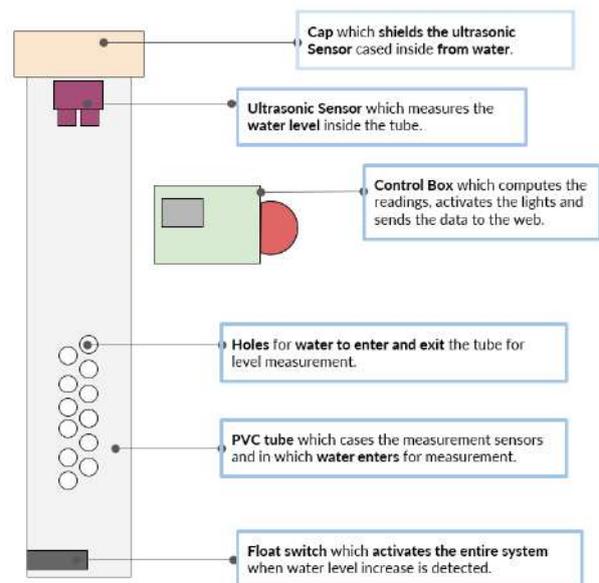
AN AUTOMATIC RESCUE SYSTEM FOR RESCUING A DROWNING SWIMMER

Patent No. 567992, June 2025

## MSME Hackathon Grant

**Idea 1: Smart Water Level Indicator for Waterlogged Roads**  
Harnessing IoT to tackle urban flooding, this innovative project ensures real-time alerts and safer travel during heavy rains.

Project Cost: ₹5.30 Lakh | Sanctioned: ₹5.30 Lakh



**Idea 2: Portable ECG Machine with AI-Powered Diagnostic Intelligence**

Revolutionizing cardiac care with a compact ECG device integrated with an AI-based image diagnostic algorithm for faster, smarter, and accessible health monitoring.

Project Cost: ₹10.50 Lakh | Sanctioned: ₹10.50 Lakh

## e-Yantra Principal Meet at SVP CET, Nagpur

Speaker : Prof. Kavi Arya, Founder, e-Yantra

March 2024



## Achievement



**e-Yantra Lab of our college is Ranked among Top 3 Labs nationwide and faculty incharge has been invited to IITB for Lab Presentation during e-Yantra Symposium 2023 scheduled on 5th & 6th April, 2023**

## Represented in G20

Prof Rohan Vaidya has been invited as speaker for the session on “The Future of the Work & Job Creation ” at Banaras during Y20 Summit on 18th April 2023.



भारत सरकार  
युवा कार्यक्रम और खेल मंत्रालय  
शास्त्री भवन, नई दिल्ली-110 001  
GOVERNMENT OF INDIA  
MINISTRY OF YOUTH AFFAIRS & SPORTS  
SHASTRI BHAWAN, NEW DELHI-110 001

Pankaj Kumar Singh, IPS  
Director

No. 3-37/2023-IC-Part(6)  
Dated the 10<sup>th</sup> of August, 2023

Dear Prof Vaidya,

I hope this letter finds you in the best of health and spirits. I am writing to extend invitation to you as a speaker for the session on 'The Future of Work & Job Creation' on 18<sup>th</sup> August 2023 at Rudraksh International Cooperation and Convention Centre (RICCC), during the upcoming Y20 Summit.

2. As you may be aware, India has assumed the Presidency of the G20 from 1<sup>st</sup> December 2022 for a period of one year till 30<sup>th</sup> November 2023. Youth20 (Y20) is one of the official Engagement Groups under the framework of G20. The Y20 Summit Inaugural session is scheduled to be held on 18<sup>th</sup> August, 2023 at Rudraksh International Cooperation and Convention Centre (RICCC), Varanasi.

3. The Inaugural session will be followed by various experts' panel discussions on themes including 'The Future of work & Job Creation', 'Mentoring Entrepreneurs and the Future of Work', 'AI in school and college curricula', etc. on August 18, 2023, at RICCC, Auditorium in Varanasi. These sessions will be attended by global delegates and young leaders. Your presence and valuable inputs to the international audience will enrich the event's significance and also resonate far beyond borders, sparking positive change on an international scale.

4. We will cover your air travel to/from your places of stay, boarding / lodging and local transport during Y20 Summit in Varanasi. We request you to respond to this invitation at your earliest convenience for making the necessary logistical arrangements.

5. We look forward to hearing from you soon.

With Regards,



## Major Laboratory Equipment

Modern and technologically sophisticated lab devices provide us quality results. EYantra Robotics laboratory is well equipped with modern tools and devices. Some major

equipments are given below...

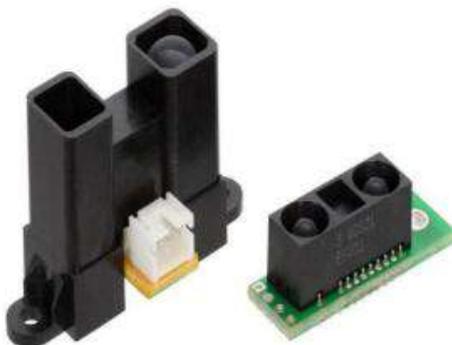
- Fire Bird V 2560
- Fire Bird V Hexapod Robot
- Spark V robot
- Wireless Camera
- Sharp GPY0A21YK0F infrared sensor
- Metal Geared Servo Motor
- NRF24L01
- Zigbee Modules.
- Fire Bird V adapter card and
- 89V51RD2 Development
- Fire Bird V LPC-2148 adapter card.



Fire Bird V 2560



Zigbee Modules



GPY0A21YK0F infrared sensor



Wireless Camera

## Co-working Space to Alumnus

Co-working facility extended to United Protocol Ltd, a startup in the domain of Blockchain and AI services, registered in New Zealand & co-founded by Mr. Pravesh Bawangade ( e-Yantra Lab Alumnus, Batch 2019, E&TC Department)



United Protocol - "Bringing entire Internet on Blockchain" It is a Web3 believers ecosystem for creators and users who envision a decentralized, user-driven digital future founded on trust in code. Products: 1) DamGo: A Truly Web3 and AI Browser 2) United Names (TLDs and Domains) 3) United Layer 1 4) Green energy powered decentralise hosting Platform. Visit [unitedprotocol.org](https://unitedprotocol.org) to embark mission.