

**ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**Shobhavan Campus, Mijar, Moodbidri - 574225**  
(Affiliated to Visvesvaraya Technological University, Belagavi Approved by AICTE, New  
Delhi & Recognized by Government of Karnataka)



A Report on

**“E-Yanta Robotics Lab”**

**Department of Electronics and Communication  
Engineering**

The Alva's Institute of Engineering and Technology has launched its e-Yantra Laboratory in October 2013. Institute encouraged to setup robotics activities and competitions with an adequate guidance and support for increasing the awareness on the recent trends in the robotics sector. Project e-Yantra is an initiative to spread education in embedded systems and Robotics by IIT Bombay. This program is sponsored by Ministry of Human Resource Development through the National Mission on Education through ICT (NMEICT). e-Yantra Lab Setup Initiative (eLSI) supports the infrastructure creation at colleges by providing a platform for training teachers both in theory and applications of Robotics. AIET has established Robotics Lab under E-Yantra Lab with the help of eLSI.

### **Vision**

**An initiative by IIT Bombay that aims to create the next generation of embedded systems engineers with a practical outlook to help provide practical solutions to some of the real world problems.**

### **Objectives:**

- To enable resource of open source projects and tutorials.
- To enhance quality of final year projects in the area of Embedded Systems and Robotics.
- To provides a platform for innovative projects ideas through e-Yantra laboratory.
- To gain visibility and attract local industries for internships and placements.

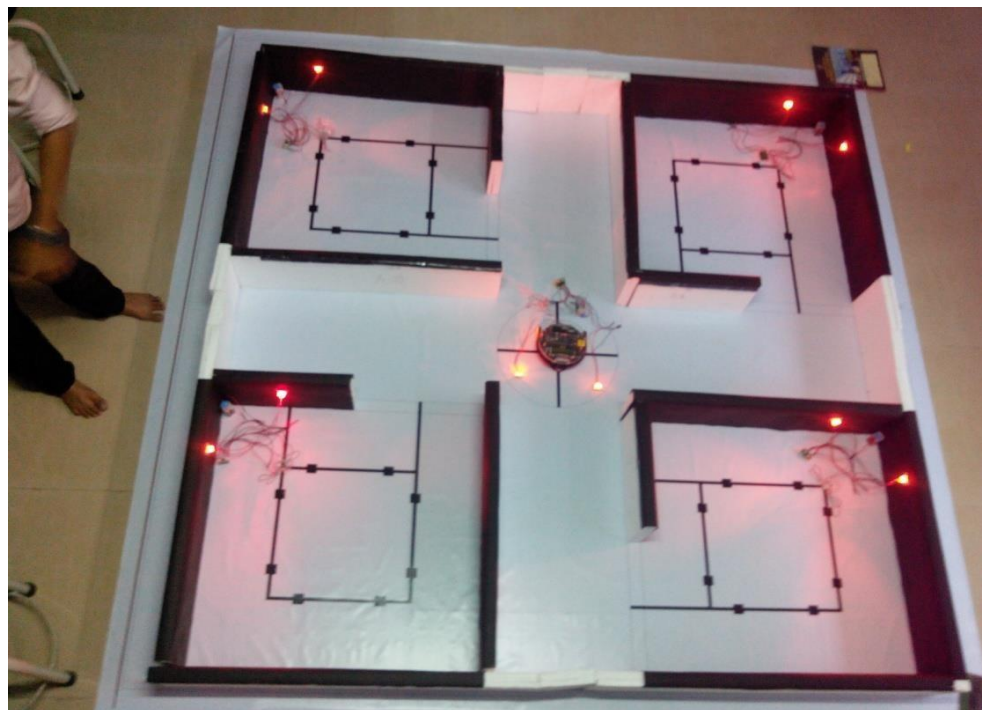
### **e-Yantra Lab Setup Initiative (eLSI)**

eLSI is an initiative to establish a culture of “Project Based Learning” through an e-Yantra Lab embedded in a college. We do this by training teachers and students through various e-Yantra initiatives in technology skills and in using these skills to solve real problems using technology.

e-Yantra Lab Setup Initiative (eLSI) is a college level program under which colleges are encouraged to setup robotics labs. AIET is privileged to be a part of this initiative since 2013. Our college has conducted a workshop on robotics to students for the consecutive two years. This workshop has helped our students in knowing the basics and programming a robotic kit.



**e-Yantra Lab AIET**



**Project Fire Fighting Robot Arena**

# **Workshop Report on 6-Axis Cobot Workshop by IGUS International Pvt Ltd. at Alvas Engineering College by E YANTRA CLUB**

**Workshop Conducted on: 14.10.2024**

## **1. Introduction**

With rapid advancements in automation and robotics technology, the role of collaborative robots, or "cobots," has expanded significantly in industries worldwide. Alvas Engineering College recognized the need to bridge theoretical learning with hands-on experience in this emerging field and, therefore, organized a workshop in collaboration with IGUS International Pvt Ltd. This workshop focused on 6-axis cobots—cutting-edge, human-safe robots designed to work alongside humans in various manufacturing and service applications. The workshop aimed to educate students on the technical workings, programming, and practical applications of these cobots, providing them with an immersive learning experience.

## **2. Objective of the Workshop**

The primary goal of the workshop was to familiarize students with the operation and application of 6-axis cobots. By focusing on hands-on demonstrations, the event sought to enhance students' understanding of robotic technology and its place in contemporary industry. It also aimed to equip students with practical skills that align with current industrial trends and to motivate them to pursue careers or research in the field of robotics and automation. Additionally, this workshop fostered industry-academia collaboration, allowing students and faculty to directly interact with IGUS experts, who brought their industry knowledge and experience into the academic environment.

## **3. Detailed Agenda**

The workshop agenda was carefully structured to cover theoretical concepts and practical applications, allowing participants to experience a well-rounded introduction to cobots.

### **3.1 Introduction to Cobots**

The IGUS team initiated the workshop with a brief presentation on cobots, focusing on the characteristics that distinguish them from traditional robots. Unlike standard industrial robots, which often operate in isolated settings due to safety concerns, cobots are designed to work collaboratively with humans. IGUS representatives highlighted the significance of cobots' enhanced safety features, flexibility, and ease of use, making them suitable for environments where robots and humans share workspaces. The presenters illustrated how 6-axis cobots, in particular, have become valuable assets in industries such as automotive, electronics, and logistics due to their dexterity and precision.

### **3.2 Mechanics and Programming of 6-Axis Cobots**

The workshop continued with an in-depth technical session on the structure and functionality of 6-axis cobots. The IGUS team explained each axis and its role in the robot's movements, detailing how these axes enable cobots to perform complex tasks that require a high degree of maneuverability. The programming aspect was also covered, where students were introduced to the basic principles of robotic coding and control algorithms that allow cobots to execute various functions autonomously. This segment allowed students to understand the process of setting up and programming cobots for specific tasks and gave them insight into how programming decisions impact a robot's behavior and efficiency in real-world applications.

### **3.3 Safety Features and Real-World Applications**

Safety is a paramount concern when it comes to cobots, especially given their collaborative nature. The IGUS team showcased the various safety features built into the 6-axis cobots, including sensors, collision detection systems, and emergency stop functions that allow cobots to detect human presence and respond accordingly. Through practical examples, the IGUS representatives illustrated the diverse applications of cobots across different industries. For instance, cobots are frequently used in assembly lines for repetitive tasks, in medical environments for precision-based operations, and in logistics for sorting and packaging. This session was particularly valuable, as it demonstrated to the participants the versatility and scalability of cobots in addressing industrial challenges.

### **3.4 Practical Demonstration**

The highlight of the workshop was a live demonstration of a 6-axis cobot in action, which allowed students to observe the cobot's capabilities firsthand. The IGUS team demonstrated various tasks that the cobot could perform, including handling, sorting, and assembly operations. Students were able to see how the cobot's six axes provided a wide range of motion, enabling it to perform precise, intricate movements that traditional robots might struggle with. This interactive segment allowed students to visualize how the theories discussed earlier translated into practical capabilities. Many students were encouraged to approach the cobot closely, allowing them a unique, hands-on opportunity to understand the robot's functioning and control features.

### **4. Key Attendees and Their Contributions**

Placement Officer Mr. Sushanth Lobo and Dr. Guruprasad B., Head of the Electronics and Communication Engineering (ECE) Department, were present to support the workshop. Their participation underscored the college's commitment to fostering technical education and providing students with industry-aligned training. Mr. Lobo highlighted the importance of such workshops in enhancing students' employability, as knowledge of robotics and automation is becoming increasingly valued in engineering fields. Dr. Guruprasad B. appreciated the efforts of IGUS in collaborating with academia and expressed hopes for continued engagement that would allow students to benefit from similar industry-oriented experiences.

### **5. Student Interaction and Feedback**

The workshop encouraged active participation from students, who were enthusiastic to engage with the IGUS experts. During the interactive session, students asked questions related to cobot programming, troubleshooting, and the potential for customization in specific industrial tasks. The IGUS team provided insightful responses, addressing students' technical queries and offering real-world examples to illustrate the versatility and adaptability of cobots. Students expressed appreciation for the hands-on demonstration, as it provided them with practical exposure that complemented their classroom learning. The feedback was overwhelmingly positive, with many students requesting additional sessions or internships that would enable them to further explore robotics and automation.

## **6. Impact and Future Scope**

The IGUS workshop proved to be an invaluable experience for students and faculty alike, bridging the gap between theoretical learning and practical application. By allowing students to directly interact with advanced robotic technology, the workshop not only enhanced their technical knowledge but also motivated them to consider careers in robotics, automation, and related fields. The event has also set a foundation for potential future collaborations between IGUS and Alvas Engineering College, with discussions around organizing similar workshops, internship programs, and project-based learning opportunities for students.

## **7. Conclusion**

The 6-axis cobot workshop conducted by IGUS International Pvt Ltd. was a comprehensive and insightful event that provided Alvas Engineering College students with a unique opportunity to learn from industry experts. The combination of theoretical presentations, interactive discussions, and live demonstrations enriched the participants' understanding of modern robotics and its applications. The participation of Placement Officer Mr. Sushanth Lobo and Dr. Guruprasad B. further underscored the college's commitment to industry-linked education. Moving forward, Alvas Engineering College aims to organize more such industry-driven workshops to equip students with the skills required to excel in the rapidly evolving technological landscape.

### **Glimpses of Workshop**











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