E-Yantra Lab

DEPARTMENT OF ELECTRONICS & COMMUNICATIONS ENGINEERING

Coordinator: Dr. Parul Arora

Location: A Block, First Floor, Sector 128 Campus

Objective

The Ministry of Human Resource Development (MHRD) sponsors E-Yantra under the National Mission for ICT in Education (NMEICT) program. 'E-Yantra Lab' is a platform to harness the intellectual talent of young India to create utility based robotic applications for usage across variety of applications such as: agriculture, manufacturing, defence, home, city maintenance and services industries. The overall mission is to grow a rich eco-system of ideas and applications that can propel India's growth curve and productivity through intelligent functioning of robotics in daily living built upon an existing pool of knowledge developed by students working on such projects at engineering colleges in the area of embedded systems.

Jaypee Institute of Information Technology has taken an initiative to setup e-Yantra Robotics Lab under e-Yantra Lab Set-up Initiative (eLSI) by IIT Bombay.

There are many regular activities like: e-Yantra Robotics Competition (eYRC), e-Yantra Robotics Competition Plus (eYRC+), e-Yantra Ideas Competition (eYIC) initiated under this learning program engages the students to implement a solution to a real-world problem.

Benefits to Students

- Awareness of embedded systems, robotics technology and mechatronics.
- It provides platform to design, develop, program and testing of robots to various applications.
- Students can participate in national and international robotics competitions.
- Students can work on minor and major projects with help of e-Yantra open-source community.
- Exposure to job opportunities in robotics. Encourage to use robots to solve real life problems.

Robotics Activities

- Faculty Team members have attended the two days' workshop on "Introduction to Robotics" conducted by IIT at JIMS Engineering Management Technical Campus, Greater Noida during December 2018 and received a Robotic kit.
- Faculty Team members have won Grade –A award with cash prize after completing Task Based Training (TBT) conducted by IIT, Bombay.
- Inauguration of "e-Yantra Robotics Lab" on 30th July 2019 by Dr. V. P. Arunachalam, Director-SNS institution

Hardware/Software Availability

P89V51RD2 Development Board is a low-cost platform based on 8051 microcontrollers. The platform can help students to kick start with basic level of programming and applications related to 8051 microcontrollers. The platform has on board power supply and various FRC connectors to interface real time signals with the controller and helps getting real time output after processing.
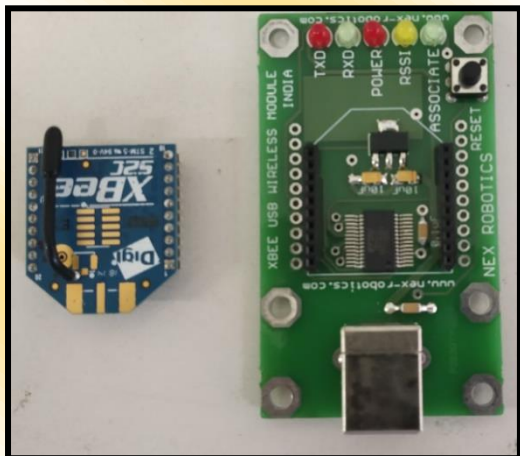
XBee interfacing module / adapter is used to interface XBee to the microcontroller and microprocessor board for long distance wireless communication. The wireless communication is through the 802.15.4 specification. The module can be used to control devices wirelessly and form a network of sensors in the case if WSN network.

FIRE BIRD V is a creative innovation by NEX Robotics and Embedded Real Time Systems lab, CSE IIT Bombay. It include open source philosophy in its software and hardware to help innovator to create new applications. With FIRE BIRD V one can experiment algorithm, develop applications and test it into real time environment. Modular sensor pods can be mounted on the platform for dedicated applications. As well it has some onboard sensors to develop some interesting robotics applications.

Applications:

- Learning Embedded systems and robotics
- Mapping and autonomous navigation
- Mobile sensor network
- Real-Time systems Collaborative robotics
- Swarm robotics and other behaviours
- Control systems

Raspberry Pi 3 Model B is the earliest model of the third-generation Raspberry Pi. It is equipped with Quad Core 1.2GHz Broadcom BCM2837 64bit CPU. The onboard 1GB RAM helps make the real time process fast. The board can be connected to internet through Ethernet port provided. The board can be used to real time applications. The platform is designed to interface various hardware and helps to process the algorithm in real time.

White line following using Firebird V robot: Here, robot follow the white line and stop when an obstacle is detected on its path.

Glimpses of the Venue