



Institute of Infrastructure Technology Research And Management

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E-Yantra Workshop

E-Yantra is a project to spread Embedded systems and Robotics education in colleges across India. The e-Yantra Lab Setup Initiative (eLSI) enables colleges to set up Robotics labs and teach Robotics and Embedded systems in an effective manner. E-Yantra Lab Setup Initiative (eLSI) is a holistic approach to,

- Impart theoretical and programming knowledge to teachers through workshops
- Provide hands on training to teachers through regional e-Yantra Robotics Teacher Competition
- Help colleges set up their own Robotics labs.

Institute of Infrastructure, Technology, Research and Management (IITRAM) is a nodal center for Gujarat state and it has provided equal opportunity to all the colleges of Gujarat to participate in this workshop. This is achieved by,

- Acquiring details of all the engineering colleges in Gujarat
- Contacting Principals/Director through emails and telephonic calls to spread knowledge of this workshop
- Circulating E-Yantra brochure and other necessary details through emails
- Selecting a team of 4-teachers with one member as team leader

There were more than 15 colleges participated in this workshop such as MSU Baroda, ITM- Universe, DDU Nadiad, B.H. Gardi College of Engineering, Marwadi Education etc. The workshop was held on 20th and 21st February, 2015 at IITRAM.

How the Workshop is Funded

E-Yantra is supported by MHRD through the National Mission on Education through ICT (NMEICT). Prof. Kavi Arya is the Principal Coordinator of the project and Prof. Krishna Lala and Prof. Saraswati are in the group.

Organization of the Workshop

Various aspects of the workshop are taken care of by the MHRD, IIT BOMBAY and IITRAM. These include,

- Training all the participants with no registration fees
- Arranging video conference with Prof. Saraswati
- Providing robots to all the participants during training sessions for performing hands on exercises

- Providing software training in Computer Lab of IITRAM that is equipped with more than 50 high-performance computer
- Providing Breakfast, Lunch and snacks throughout the workshop
- Providing free take away robots with DVD to the participants with LOI (letter of intent)
- Providing list of necessary equipment to start up the robotics lab

Workshop Methodology and Approach

The content of the workshop is efficaciously delivered to all the participants through simplified examples and through group based exercises initially. Subsequently, the difficulty level was increased. Following sequence is adopted in the training process.

- Introduction to Fire Bird V robot
- Introduction to AVR Microcontroller and Programming environment
- Motion control using I/O ports
- Robot velocity control using pulse width modulation
- Interrupt programming
- Closed loop position control of robot using position encoders
- Introduction to LCD interfacing
- Display of Data Array of eight elements on LCD
- Interfacing with white line sensors
- Robot programming for white line following
- Adaptive cruise control

Thus, the content of the workshop remained structured, following a logical sequence. Various hands on exercises were done in the training process. Further, discussions were encouraged within all the sessions. At the end of workshop, a short quiz was arranged and feedback was collected from all the participants.

Follow-up Activities

The Robot competition will be held after six months. The team of teachers will participate in this competition and winner team will be awarded with two more robots. The team will also get a chance to participate at national level with the winning teams of other states. The technical support and other queries will be answered by IIT Bombay and IITRAM.

Workshop Certification

Registration of the participants was done online and the registered candidates are given certificates.

Team Members (IITRAM)

We thank the team members of E-Yantra workshop for their active involvement.

- Dr Ketan Badgujar
- Dr Abhishek Rawat
- Prof Krupa Shah
- Mr. Himanshu Verma







