

Press Release (eYIC)

e-Yantra Ideas Competition (eYIC-2018) and e-Yantra Symposium (eYS-2018)

March 23-24, 2018, VMCC, IIT Bombay

Paul Krugman, the American economist who won a Nobel Prize in 2008, has warned that India could end up with huge mass unemployment if it does not grow its manufacturing sector. Also that "things like this (i.e. AI) could be a cause for worry for Indian services sector." He goes on to say that "in Asia, India could take the lead but only if it also develops its manufacturing sector, not only the services one."

(The Economic Times 17th Mar. 2018).

This in essence is the challenge before us - the "demographic dividend" of a young population could turn into the "demographic nightmare" of mass unemployment. We need every institution in the country: government, industry, students and civil society to align themselves in the direction of job creation. Our educational establishments have proven unequal to this challenge.

In this scenario e-Yantra (a Ministry of HRD funded flagship project) in IIT Bombay has quietly been working for the past 6 years and has an important story to tell. e-Yantra is a Robotics Outreach project that emerged out of the Embedded Systems course taught in the Computer Science & Engg. Dept. and now has a national footprint.

This year's e-Yantra Symposium achieves a six-year track record of running a massive (MHRD-funded) National Robotics outreach program. On display are the finals of two of its major student-facing initiatives: the e-Yantra Robotics Competition (eYRC-2017) and e-Yantra Ideas Competition (eYIC-2018).

Whereas the National Robotics competition engages annually with students, e-Yantra has extended its contact with students and teachers by setting up robotics lab in colleges throughout the country. A college invests Rs. 2 lakh in basic equipment and nominates four teachers who are trained by e-Yantra over a period of 6 months. Training involves a two-day face-to-face workshop followed by an online Task Based Training (TBT). The project has established 280 e-Yantra labs throughout the country over the past three years. Our college, Fr. Conceicao Rodrigues College of Engineering, Bandra, under the leadership of its Principal, Dr.Srija Unnikrishnan, has established an e-Yantra lab to upgrade the skills of our students.

e-Yantra Ideas Competition (eYIC) seeks to identify and nurture potential entrepreneurs in the e-Yantra Labs that the project has set up throughout the country. Students are invited to submit a proposal to solve a local problem using their e-Yantra lab and after an intense process of selection and vetting, are permitted to go ahead and build the proposed system using their e-Yantra labs. Following a pre-selection in regional finals this year in Coimbatore, Ernakulum, Bangalore, Pune, Mumbai, Ahmedabad and Noida, the 18 finalists present their implemented ideas at IIT Bombay on March 23-24, 2018. We are delighted to say that the team of Fr. Conceicao Rodrigues College of Engineering, Bandra with its project **Automated Traffic Surveillance System**, was one of the 18 finalists in the e-Yantra Ideas competition. This makes our team one of the top **2.83** percent of the contestants. It also won the **Best Algorithm Design** award.

Now that this IIT-based project has reached critical mass, it seeks to make a major difference to the 'Make in India' initiatives in the country by directing the activities in e-Yantra labs towards local industry. The e-Yantra Symposium is an attempt to reach out to industry, where the team presented its model for academia-industry engagement using the 280 labs it has established. This was followed by a panel discussion led by industry leaders such as: Vallabh Bhanshali (Chairman, Enam Securities Pvt. Ltd.), Anil Lingayat (Head, Manufacturing, Godrej & Boyce), Prof. Dinesh Singh (ex-VC, Delhi University), Prof. Ashok Misra (ex-Director IIT Bombay) and

Prof. SS Mantha (ex-Chairman, AICTE) on how this potent model may best be used for academia-industry engagement. With us were also Meeta Rajivlochan (Director, RUSA Maharashtra), Dr. Shivprasad Khened (Director, Nehru Science Centre, Mumbai), Romesh Kaul (MD, Mahindra CIE Ltd.), Mahesh Samat (Head, Disney India) amongst a host of others.

Following the panel discussion were talks in an inspirational vein for the 200+ finalists and the nearly 60 teachers being hosted at IIT Bombay. The speakers included Prof. Dinesh Singh (ex-VC, Delhi University), PV Subramanyam (financial consultant) and Rashmi Bansal (best selling author on entrepreneurship).

Visitors also had the chance to browse the finalists of the e-Yantra Ideas Competition exhibits where students from regional e-Yantra labs have turned problems into opportunities to solve local problems using the resources of the e-Yantra lab in their college. Prof. Kavi Arya (Principal Investigator, e-Yantra) believes this to be an important beginning to the startup model being proposed.

Almost 40+ IITB faculty across departments have volunteered to help evaluate the finalists of the two competitions. Says Dr. Krishna Lala, Sr. Project manager e-Yantra, "This just shows that technology is a passion all around for IIT teachers." Dr. Saraswathi Krithivasan (Sr. Project Manager) suggests "the students who have worked hard to reach the finals have the envied privilege of being grilled in depth about their work by IIT faculty."

The goal is the much-coveted prize of a six-week paid summer internship with the e-Yantra team where they get the opportunity to work 24x7 on ambitious technical projects under the guidance of e-Yantra mentors and exposure to a host of training in soft skills, theatre workshops, meditation sessions, lectures on history and so on.

This year, Prof. Arya plans to travel around the country helping connect these labs to industry. e-Yantra has a working platform and he has tasked himself to get the word out to industry to engage with its labs. "We owe it to the young talent who have been failed by our education system but have so much to contribute to society. e-Yantra wishes to inspire the new generation to think of itself differently: not just as knowledge consumers but also as knowledge creators."

e-Yantra is definitely showing the way.

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Automatic Traffic Surveillance System

Saim Shaikh, Omkar Joshi, Deval Srivastava, Priyank Shah
Prof. Kalpana Deorukhkar
Fr. Conceicao Rodrigues College of Engineering

<p>Signal & Helmet Offender</p> <p>A camera lens is chosen which can be captured in the same viewing line (range) of the sensors will be calculated ensuring that line will be used in next module for license plate extraction. Vehicles are processed using TensorFlow. Client interface app created in Java/Android/iOS.</p> <p>For helmet offenders, their faces are captured and then given to a neural network for better detection. The network is saved to a self-created database in local server format.</p>	<p>Over Speeding</p> <p>The car size detected by Background subtractor, MOSE to take difference of previous and current frame and then it is thresholded to get the number. Microcontroller interface was used after that resulting frames are captured. Sound having license or vehicle. Once that is done, time is calculated for car to travel a certain fixed distance on the distance is linear and range of camera speed of moving object is calculated.</p>	<p>license plate</p> <p>The license plate extraction uses morphological extraction method. It takes the difference of its square and a closed shape then threshold the image. After preparing the image a little, we find contours on it. The contours are filtered according to certain dimension criteria. The candidate contours are further filtered by looking for character data and finally a single one is selected.</p>
<p>Future Scope</p> <ul style="list-style-type: none"> - Identifying those who don't obey lane rules and obstruct lanes - Analytics over the collected data and make future predictions - Integration with a mobile app and provide online live way facility - No entry detection on highways and one way roads - Detection of traffic and detecting illegal vehicles 	<p>Website</p> <p>The website presents the data in real time format using graphs and plots the offense locations on a map for better readability. The data is stored in our MongoDB database and can be used later for analytics. Website offers a key for the traffic police to view offender information whose the license plate is available. The website runs on mobile and is based on Java.</p>	
<p>Software requirements</p> <p>1. TensorFlow 3. Competent Gpu 8. TTeam 2. OpenCV 5. NodeJS/MongoDB 7. misc Python Libraries 6. HD Camera capable of recording video</p>		

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e-Yantra Ideas Competition 2018
IIT Bombay



