



**SGGS Institute of Engineering and Technology**  
**Vishnupuri, Nanded (MS)**



**CENTER OF EXCELLENCE**  
**(SIGNAL & IMAGE PROCESSING)**  
**(Brief Report)**

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# ACKNOWLEDGMENT

My efforts bore fruit with the successful establishment of state-of-the-art Centre of Excellence in Signal and Image Processing at Shri Guru Gobind Singhji Institute of Engineering and Technology Vishnupuri, Nanded (MS). Through this establishment, firstly we could create world class facilities and high end equipment for carrying out research. Secondly, this has created a 24 X 7 conducive research environment for researchers in cutting edge technology.

However, there are many others who share the reward of this effort simply because it would never have been this good without their help. I acknowledge the cooperation, encouragement and austerity of entire unit of office bearers of NPIU Delhi and SPFU Maharashtra state for providing funding and guidance, which did half the magic of keeping me thrilled throughout this establishment of CoE. My special thanks to our mentor Prof V.M. Gadre, IIT Bombay for guiding us throughout CoE establishment.

I extend my sincere gratitude to hon. Shri Sunil Raithatha (Chairman BoM), Hon. Shri Milind Pohanerkar, and Triloksingh Jabinda (Members of BoM), for whole heartedly supporting from institute side for establishment of this CoE. My special thanks to Dr. L. M. Waghmare (Director) for trusting that I could do this project and stand up to his expectations. It was all his trust in me and support he provided that led me to think beyond what I thought I was capable of doing. It was highly impossible to achieve this without whole hearted support of my teammates Dr S N Talbar, Dr. S S Gajre, Dr. R S Holambe, Dr. A. R. Patil, Dr. R R Manthalkar, Dr. Y V Joshi, Dr. S. T. Hamde, Dr. U V Kulkarni, Late Dr. R. C. Thool, Dr. D. D. Doye, Dr. S. V. Bonde, Dr. A. B. Gonde, , Dr. M. P . Rajurkar, Dr. A. V. Nandedkar, Dr. S G Kejgir, and Dr. L. V. Birgale, who worked on this project with me and who have helped me wherever and whenever I got stuck and for being patient with me even at the toughest hours. Each of you played a very crucial role in the establishment of this CoE.

My special thanks to all my research scholars, Mr.Ravi Kamble, Ganesh Singadakar, Prasanna Porwal, Hemprasad Badgular, Suhas Sapate, Mukund Nagre, Narendra Jadhav, Ujjwal Baid, Akash Gandhmal, Gajanan Galshetwar, Sagar Tambe, Mininath Bendre, Ms. Sujata, Manjiri, Bhakti, Nilima, and all M. Tech students for volunteering in organizing thirty six different activities under CoE.

I would like to express my gratitude towards the members of Account and office section Mr. Hardeep Singh Hujuriya, Mr. Kiran, Mr. Damkondwar, Mr. Rampure, Mr. Bijamwar and Mr. Kuldeep Pardeshi for continuous and wonderful support. Working with you has been a reward indeed. Without help of you all, this establishment of CoE would have never been completed in such a fruitful way.

**Manesh B Kokare, PhD**  
**PI- CoE Signal and Image Processing**

# About Center of Excellence

As a part of ambitious plan of government of India, NPIU has selected 30 best institutions in India through competitive proposals from all over India for establishment Center of Excellence (CoE) for collaborative and multidisciplinary research within specific thematic areas of regional or national importance. The Center of Excellence will be supported with research funding of Rs. 5 crores under the World Bank Assisted Technical Education Quality Improvement Program of India (TEQIP)-II. Based on the competitive merit, our institute is one among 27 best institutions selected for establishing Center of Excellence.

The Center runs a multidisciplinary research program involving more than 20 faculty members and 14 research scholars from various departments of engineering and basic science of institute. The Center has started its functioning in its state-of-the-art Signal and Image Processing Laboratory equipped with all the ultra modern machinery set at par with any international research center. Apart from carrying out frontier research in the areas mentioned above, the center aims at creating technologies that can be commercially exploited by industries. The Center is also engaged in an ambitious plan for generating high caliber manpower and entrepreneurs in the field of Signal and Image Processing.

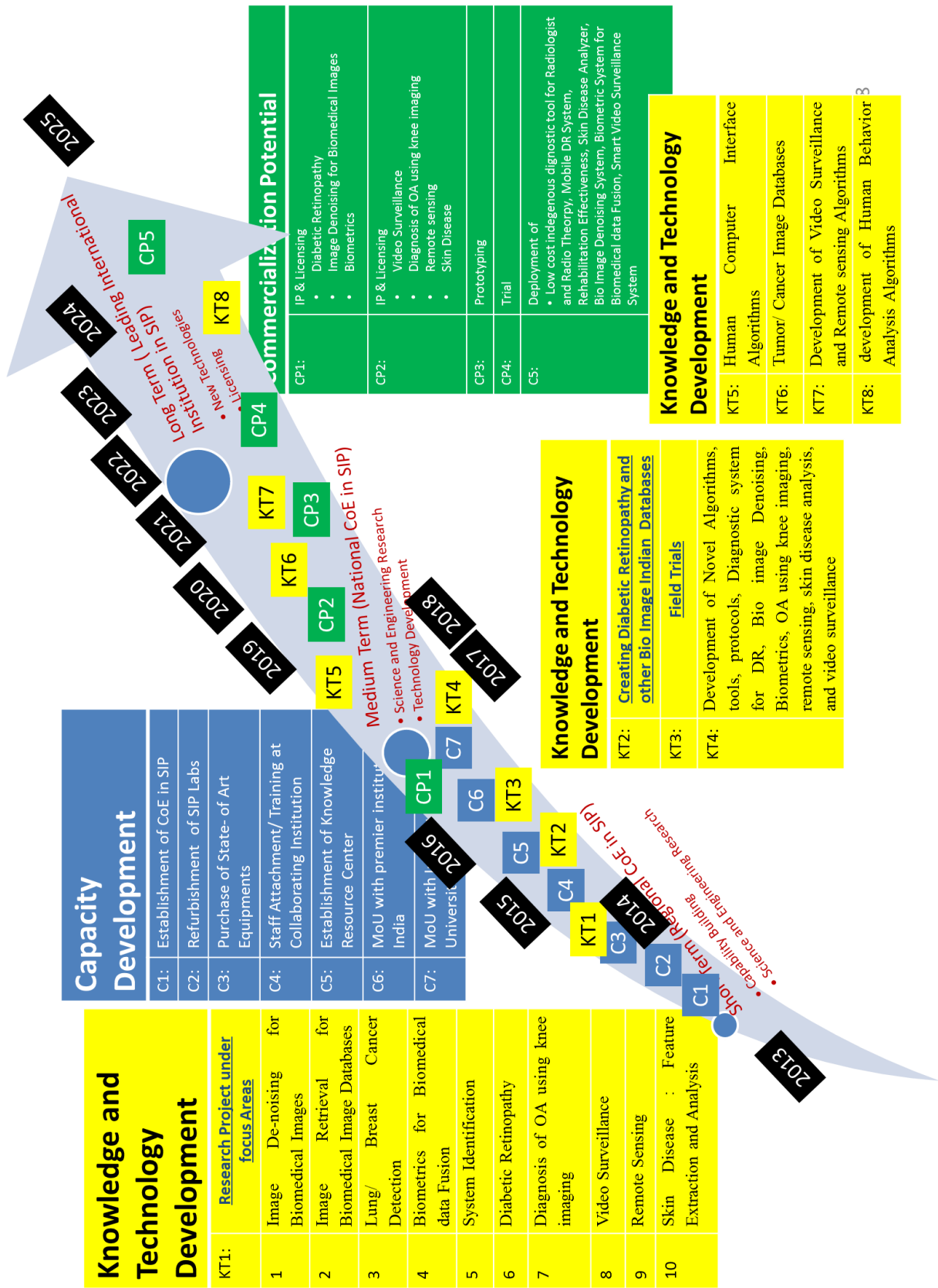
The key aim of center is to attract and tap the top class talent to carryout frontier research in Signal and Image Processing. The CoE is expected to contribute to the training of R&D manpower for industry. To achieve this there is need to recruit research scholars at least twice in a year i.e. in every semester through thorough competitive environment.

- Establishment:
  - September 2013.
  - Formal Inauguration on 19<sup>th</sup> Sept 2015.
- Aspiration: To Become Leading World Class Centre of Excellence (CoE) in Signal and Image Processing and Analysis.

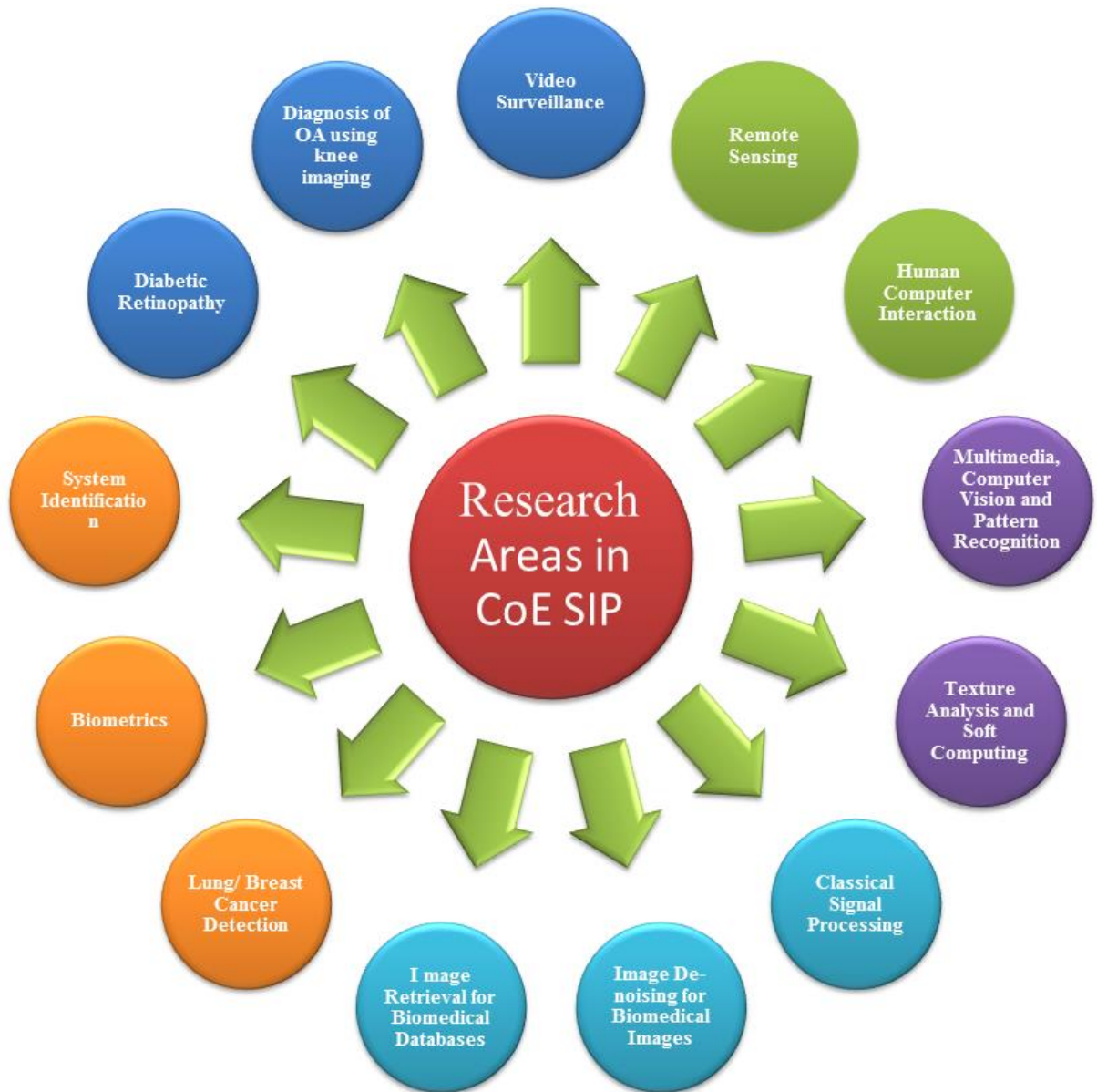
## Objectives

1. Establishing the State-of-the art- facilities to carry out research work in SIP.
2. Increase production of advanced human capital by increase in enrollment of master's and doctoral students, increase in placement, and updated and more relevant UG and PG curricula.
3. Develop long term R&D capability as evidenced by increase in publications in refereed journals, a joint publication with international authors, joint programs/projects/exchanges with international research organizations, publication of books, and technical reports.
4. Increase in collaborative and applied research as documented by increase in external R& D funding, notably industry sponsored projects and industry chairs, patents filed and obtained or other manners of knowledge commercialization and transfer.

# Roadmap of CoE up to 2025



# Areas and Expertise



## Specific Thematic Areas of Research

- Biomedical Signal and Image Processing
- Biometrics



# People

## Team of CoE



Dr L M Waghmare  
PhD (IIT Roorkee)



Dr M B Kokare  
PhD (IIT Kharagpur)



Dr S N Talbar  
PhD (SRTMU)



Dr R S Holambe  
PhD (IIT Kharagpur)



Dr Y V Joshi  
PhD (IIT Delhi)



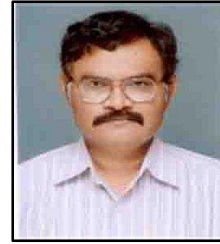
Dr B M Patre  
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## Research Scholars


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<b>Research Advisor:</b> Dr. S. N. Talbar	

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<b>Research Advisor:</b> Dr. M. B. Kokare	



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**Research Advisor:** Dr. A. b. Gonde



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**Research Advisor:** Dr. R. R. Manthalkar, Dr. D. D. Doye



**Ms. Mayuri Kailas Sadafale**

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**Research Topic:** Design of Multiscale Multidirectional Local Descriptor for Content Based Image Retrieval.

**Research Advisor:** Dr. S. V. Bonde

# Goals Achieved





- State- of-the-art Center of Excellence in Signal and Image Processing is established in the area of 3024sq ft. Students are using this facility rigorously, since it is open 24 X 7 for researchers.
- High end equipment's needed to carry out research in thematic area are purchased and students are using it rigorously.
- Separate knowledge resource center is established with reference book, text book and journal proceedings in the thematic area of research.
- Ultra-modern conference room with video conferencing facility is established.
- Number of Research Scholars Affiliated to CoE:
  - Eight Full time research scholars are appointed in CoE.
  - Seven full time research scholars from other schemes like QIP and Vishweshraya fellowship are also working in this CoE.
  - 96 research scholars are part time.
- Increase in PG intake from 18 to 30 from this academic year 2015-16.
- Publications in refereed journals are increased. 108 papers are published in referred journals/ conferences after establishing CoE.
- Cumulative citations of publications has reached up to 6798.
- **Ten joint research projects** between SGGSI&T Nanded and UTP Malaysia are identified. Presently research work is going on these projects.
- **Thirty Six Activities (STTP/ Workshop/ Conference)** are conducted for the benefits of faculty members and research scholars. This has benefitted **2319 researchers/ students and faculty members.**
- Two Joint Faculty Development Program with UTP Malaysia:
- National Conference on IConSIP was organized on 10<sup>th</sup> and 11<sup>th</sup> July 2015.
- This CoE has organized **summer internship program for UG and PG students** of other institute from 15<sup>th</sup> May to 9<sup>th</sup> July 2016. This has benefitted 15 students from other institute.
- This CoE has successfully hosted an International Conference on Signal and Information Processing (IConSIP-2016) during 6<sup>th</sup> -8<sup>th</sup> October 2016.
- This conference was jointly organized by IIT Bombay, College of Engineering Pune, S V University College of Engineering Tirupati and Technically supported by IEEE Bombay section.
- This mega international event was proudly hosted at SGGSI&T Nanded.
- Following Seven International Key note Speakers addressed the gathering
  - Prof. B S Manjunath (University of California Sanata Barabara USA),
  - Prof. Peter MacFarlane (University of Glasgow, UK)
  - Prof. Subra Ganesan (University of Oakland, Rochester, USA)
  - Prof. Md. Fadzil M. Hani (University of Technology PETRONAS, Malaysia)
  - Prof. Rangaraj Rangayyan (University of Calgary, Canada)
  - Bruno Lay (ADCIS, France)
  - Fawnizu (UTP , Malaysia)
- Near about 300 participants attended this conference.
- This is very good example of collaborative research work of same thematic area of CoE.

# CoE Infrastructure

- State of the Laboratory with 24x7 Access facility
- Separate Library
- Conference Room with Video Conferencing Facility
- Separate Cubicle for each Research Scholar
- 24x7 Laboratory Video Surveillance System



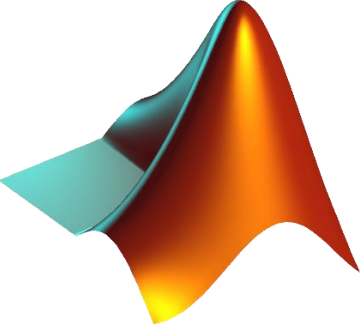




# CoE Equipment's

Equipment	Specifications (Details)
<p data-bbox="256 457 548 489"><b>Computing Machines</b></p> 	<ul data-bbox="630 394 1442 760" style="list-style-type: none"> <li>• Quantity: 35 Work-Stations (Computing facility)</li> <li>• 4th Gen Intel Core I7-4770 Processor (Quad Core HT,3.40GHz Turbo, 8MB, w/ HD Graphics 4600)</li> <li>• 8GB (2x4GB) 1600MHz DDR3 Non-ECC</li> <li>• 500GB 3.5inch Serial ATA (7,200 Rpm) Hard Drive, 16x DVD-ROM Drive 1</li> <li>• Intel Core I7 Processor LabelDell(TM) Professional P2213 22" Wide Screen Monitor with LED Back Light</li> <li>• USB Optical Mouse 1, QWERTY USB Keyboard, Internal Speaker</li> <li>• Windows 7 Professional, 64bit</li> </ul>
<p data-bbox="293 779 511 810"><b>Retinal Camera</b></p> 	<p data-bbox="630 779 1300 810"><b>Topcon TRC-NW300 Non-Mydriatic Retinal Camera</b></p> <ul data-bbox="630 814 1442 1012" style="list-style-type: none"> <li>• Auto focus, auto exposure and auto capture 8 megapixel CCD camera for superior image quality</li> <li>• All-in- one design, direct printout facility</li> <li>• Auto small pupil detection (3.3mm)</li> <li>• Lower flash intensity</li> <li>• Optional IMAGENet software for advanced image analysis</li> </ul>
<p data-bbox="349 1045 456 1077"><b>Servers</b></p> 	<p data-bbox="630 1024 1133 1056"><b>Branded 2-socket tower high-end server</b></p> <ul data-bbox="630 1060 1442 1352" style="list-style-type: none"> <li>• Processor: Intel Xeon E5-2430 v2 2.50GHz, 15M Cache,7.2GT/s QPI, Turbo, 6C, 80W, Max Mem 1600MHz</li> <li>• Memory: 32GB RDIMM, 1600Mhz, Low Volt, Dual Rank, x4 Bandwidth</li> <li>• HDD: {600GB X 2 Nob } 3.5-inch 15K RPM,6Gbps, SAS Hot Plug Hard Drive</li> <li>• RAID: PERC H310 Integrated RAID Controller, Full Height Optical Drive: 16x SATA DVD +/- RW Drive</li> <li>• Embedded Systems Management: iDRAC7 Express</li> </ul>
<p data-bbox="224 1371 589 1444"><b>Finger Print Identification Platform</b></p> 	<p data-bbox="630 1371 1239 1402"><b>Large Scale Finger Print Identification Platform</b></p> <ul data-bbox="630 1407 1442 1696" style="list-style-type: none"> <li>• Professional more than one Finger Print scanning and Rolling finger print image capture device: 3.2x3.0 inch (81.28x76.20 mm) scanning area; Captures a high quality 4 fingerprints image in less than 1.0 sec, capture fingerprint in a 1.6x1.5 inch (40.64x38.10mm) scanning area to create a rolling fingerprint image; compact and robust.</li> <li>• It is suitable for use in various environments and applications including border control, electronic ID; SDK for designed for PC-based, embedded and mobile biometric application development</li> </ul>



<p><b>Palm Based Recognition Platform</b></p> 	<p><b>Camera System for palm based recognition platform</b></p> <ul style="list-style-type: none"> <li>• Palm capture system with 2590 x 2048 at 20fps or more camera;</li> <li>• relevant optics for the same;</li> <li>• SDK to support palm capture.</li> </ul>
<p><b>3D Camera</b></p> 	<p><b>Panasonic 3D Camera</b></p> <ul style="list-style-type: none"> <li>• 1920 x 1080/60p HD 3D Video Recording</li> <li>• SD/SDHC/SDXC Flash Memory</li> <li>• 3 x 1/4.1" 3.05MP CMOS Sensor</li> <li>• 3" Touch Screen LCD</li> <li>• Leica Dicomar Built-In Lens, VW-CLT1 3D Conversion Lens, 18x Intelligent Zoom, Hybrid Optical Image Stabilization, Digital Still Capture</li> </ul>
<p><b>Multispectral Camera</b></p> 	<p><b>JAI Multispectral Camera</b></p> <ul style="list-style-type: none"> <li>• Sensor Visible Near-IR: 1/3" color Bayer mosaic IT CCD (ICX447) 1/3" Monochrome IT CCD (ICX447) .</li> <li>• Pixel Clock: 51.324 MHz, Frame rate: full frame 31 frames/sec, Active area: 4.86 (h) x 3.63 (v) mm, Cell size 3.75 (h) x 3.75 (v) μm, Active pixels 1296 (h) x 966 (v) Read-out modes Full</li> <li>• Sensitivity Visible: 0.4 Lux (max. gain, shutter off, 50% video), Sensitivity Near-IR 0.02 μW/cm<sup>2</sup> at 800nm (max. gain, shutter off, 50% video, f/2.2).</li> <li>• S/N ratio Visible &gt;52dB (Green ch., 0 dB gain, 10-bit),</li> <li>• S/N ratio Near-IR &gt;54 dB (0 dB gain, 10-bit),</li> <li>• Video output Visible Near-IR 30/24-bits RGB or 8, 10 or 12-bit raw Bayer 8, 10, or 12-bit monochrome,</li> </ul>
<p><b>Thermal Camera</b></p> 	<p><b>Thermal Imager Testo 875 - 2i Set Sr</b></p> <ul style="list-style-type: none"> <li>• Temperature Range : -20 to 350°C</li> <li>• Detector : 160 X 120 Pixels NETD : &lt; 50mK</li> <li>• Lens : Wide Angle 32° x 23°</li> <li>• Tele Photo: 9° x 7°</li> <li>• Integrated Digital Camera</li> <li>• Integrated Power LED'S</li> <li>• Voice Recording using Head Set</li> <li>• Laser Marker Auto Hot &amp; Cold Spot</li> <li>• Recognition Isotherm displayed on the instrument</li> </ul>
<p><b>EEG Machine</b></p> 	<p><b>Emotive 32 Channels EEG Acquisition System</b></p> <ul style="list-style-type: none"> <li>• Number of Channels: 32 Channels</li> <li>• Bandwidth: 0 (DC) to 125 Hz, Sampling rate: 500 SPS</li> <li>• Resolution: 24 bits – 0,05 microvolt (uV)</li> <li>• Measurement Noise: &lt; 1 uV RMS</li> <li>• Input impedance: &gt; 1 gigaohm</li> <li>• Allow for Stimulation simultaneously (tDCS and TMS compatible), Communication: Bluetooth 2.1</li> <li>• Output: EDF+, ASCII, NEDF data files or TCP/IP raw data streaming, 3 Axes accelerometer</li> </ul>

<p style="text-align: center;"><b>Still Camera</b></p> 	<p><b>SONY Digital Camera</b></p> <ul style="list-style-type: none"> <li>• ISO Auto, 100-25600</li> <li>• Autofocus Contrast Detect (sensor), Phase Detect, Multi-area, Center, Selective single-point, Tracking, Single, Continuous, Touch, Face Detection, Live View</li> <li>• Mount Lens mount, Manual focus, 179 Number of focus points, 1.5x Focal, length multiplier, Autofocus assist lamp</li> <li>• Screen 3" size, 921,600 Screen dots</li> <li>• Touch screen, TFT LCD, Live view, Tilting Articulated LCD</li> <li>• Storage types SD/ SDHC/SDXC, Memory Stick Pro Duo/ Pro-HG Duo</li> <li>• Other Features Orientation sensor, Timelapse recording, Wireless Built-In, USB 2.0 (480 Mbit/sec)</li> <li>• Micro-HDMI, USB 2.0 (480 Mbit/sec), 802.11b/g/n with NFC Wireless notes.</li> <li>• Wired or PC Remote control, Stereo Microphone, Mono Speaker, Built-in flash</li> <li>• Accessories Pouch, Optics/Lens mount kit with Magnification .75 with 3 Lens Groups 3 Lens elements with Focal Length 35mm equivalent</li> </ul>
<p style="text-align: center;"><b>Workstation</b></p> 	<p><b>Graphical Workstation</b></p> <ul style="list-style-type: none"> <li>• Processor: Intel® Xeon® processor E5-2600 v4 family with up to fourteen cores per processor</li> <li>• Memory: 16 GB DDR4 ECC RAM 2133 MHZ;</li> <li>• Hard disk drive: 1 TB SATA or higher + 512 GB SSD</li> <li>• Video card: 16 GB NVIDIA P-5000 (with SLI Cable)</li> <li>• Monitor: Compatible 23 inch LED monitor</li> <li>• Network interfacing: 10/100/1000 Integrated Network gigabit Ethernet LAN, Wireless WLAN card.</li> <li>• Power supply: 1000W or higher</li> </ul>
<p style="text-align: center;"><b>Wireless BioSignal Logger</b></p>  <p style="text-align: center;"><b>iMediLogger</b> Multi Channel Data Acquisition System</p> 	<p><b>ITIE Multichannel Logger</b></p> <ul style="list-style-type: none"> <li>• 1 channel ECG Electrodes (1 set each)</li> <li>• 4 Channel EMG Electrodes</li> <li>• RF Based Wireless transmission</li> <li>• 1 Channel RR Rate, 1 Channel SpO2</li> <li>• Transmitter &amp; Receiver Boards</li> <li>• Compact, Portable, Battery operated</li> <li>• Interactive &amp; Innovative</li> <li>• On Board Data Storage- SD Card/USB</li> <li>• Self Contained&amp; Easy Operate</li> <li>• Ideal for research And Education</li> <li>• Data Aquisition Software with Analysis</li> <li>• GUI Software compatible with</li> <li>• Matlab/LabVIEW</li> </ul>

<p><b>MATLAB Software</b></p> 	<p><b>Matlab Environment With all Toolboxes</b></p> <ul style="list-style-type: none"> <li>• Simulink, MATLAB Coder and MATLAB Compiler</li> <li>• Control System, Financial, Image Processing, Optimization, Signal Processing, Statistics and Machine Learning, System Identification, Bioinformatics, Curve Fitting, Data Acquisition, Database, DSP System Toolbox, Econometrics, Embedded Coder, Filter Design HDL Coder, Financial Instruments, Fixed-Point Designer Toolbox, Fuzzy Logic, Global Optimization, Image Acquisition, Instrument Control, Mapping, Neural Network, Parallel Computing, Partial Differential Equation, SimMechanics, Simscape, Simulink Coder, Simulink Control Design, Stateflow, Symbolic Math, Simulink 3D Animation, Spreadsheet Link EX, Simulink Real-Time</li> </ul>
<p><b>CANDENCE Module</b></p> 	<p><b>CANDENCE Module</b></p> <ul style="list-style-type: none"> <li>• Virtuoso spectre simulator-XL, Virtuoso(R) Schematic Editor-XL, Virtuoso(R) Analog Design Environment XL, Virtuoso(R) AMS Designer Environment, Virtuoso(R) AMS Designer Environment, AMS Designer with flexible Analog Simulation, Virtuoso(R) Layout Suite XL, Incisive Enterprise simulator XL, Virtuoso Digital Implementation, Encoder Power System, Cadence Physical Verification System Design, Cadence Physical Verification System, Layout vs Schematic Checker XL, Cadence QRC Extraction-L</li> </ul>
<p><b>Anti-Plagiarism Software</b></p> 	<p><b>Turnitin Anti-Plagiarism Software</b></p> <ul style="list-style-type: none"> <li>• New 40MB file upload size limit</li> <li>• ‘Email late submitters’ facility, Submit PowerPoints, Excel and Google docs for originality checking, Submit images, Submit any file type, Grade without submissions, Link inline comments and marks with Rubric card criterion, ‘Grading Forms’ (simple criteria marking sheets), Upload criteria from Excel, Student assignment submission ‘workflow’, Quantitative % grading schemes – do not need to add up to 100%</li> </ul>
<p><b>ERADAS Software</b></p> 	<p><b>ERADAS Software for Remote Sensing Application</b></p> <ul style="list-style-type: none"> <li>• Data Conversion, Orthorectification, Color balancing, mosaicking and compression, Land – cover mapping and terrain categorization, LiDAR editing and classification, Map and report generation and printing through the map composer power or word</li> <li>• Feature copyure and update, Spatial modelling and alaysis</li> <li>• Terrain creation,editing and alaysis</li> </ul>
<p><b>Patent Database</b></p> 	<p><b>Patent Database Subscription for 3 years</b></p> <ul style="list-style-type: none"> <li>• 40 million+ Full Text Records from 26 Patent Offices (US, EP, WO, DE, FR, GB, JP, KR, CN, ES, CA,CH,AT,AU ,IN,BR,TH,RU, PH, SE , NODK,FI,BE,NL and LU)</li> <li>• Searchable Full Text English Translations of JP, KR, CN, FR, DE, DK, FI, RU, NL, LU, DOCDB 92 million+ Biblio records covering 102+ countries, INPADOC 40 million+ Families and Legal Status, US Reassignments and Maintenance Data</li> <li>• PDFs, Mosaic, Calculated Fields and more</li> <li>• Semantic Index of Conceptually Related Terms for Search Assistance</li> </ul>



# Inaugural Ceremony

19<sup>th</sup> September 2015

Shri Guru Gobind Singhji Institute of Engineering and Technology Nanded had organized a “Inaugural Ceremony of Center of Excellence in Signal & Image Processing” on 19<sup>th</sup> Sept. 2015. Center of Excellence in Signal & Image Processing was inaugurated in the presence CEO of Marathwada Auto Clusters, Aurangabad, Former Professor from IIT Kharagpur, Joint Director DTE Aurangabad, Head Monitoring and Evaluation, SPFU-DTE, Mumbai and some members from Board of Governance, Coordinator and Director of the host institute. The main aim of this Inaugural ceremony was to make the State of the Art Laboratory open to all the Faculty Members, PhD and PG students working in Signal and Image Processing, Research Collaboration of the Institute with Indian Institute of Technology for joint Research.

## Participants/Audience:

There were in total around 200 Audience comprising of faculty members, PhD and PG students from the host institute as well as the faculty members from IIT, Roorkee, College of Engineering, Pune, Local Engineering Institutes and Journalists.

## Facilitators/Guests:

 <p><b>Mr. Ram Bhogale,</b> Chairman, Marathwada Auto Cluster, Aurangabad</p>	 <p><b>Dr. T. K. Basu,</b> Former Professor, IIT, Kharagpur</p>	 <p><b>Dr. T. R. Sontakke,</b> Former Director, SGGSIE&amp;T, Nanded</p>	 <p><b>Dr. M. D. Shivankar,</b> Joint Director, DTE, Aurangabad</p>
 <p><b>Dr. Surendra Bhoslae,</b> Head Monitoring and Evaluation, SPFU- DTE, Mumbai</p>	 <p><b>Dr. A. U. Digraskar,</b> Former Central Project Advisor, NPIU</p>	 <p><b>Dr. R. Subramanian</b> Professor, IIT, Roorkee</p>	 <p><b>Dr. P. P. Roy,</b> Professor, IIT, Roorkee</p>

## **Objectives:**

1. Inauguration of Center of Excellence (CoE) in Signal & Image Processing (SIP)
2. To make the State of the Art Laboratory open to all the Faculty Members, PhD and PG students working in Signal and Image Processing
3. Research Collaboration of the Institute with Indian Institute of Technology for joint Research



Inaugural Ceremony started at 11.00 am with Welcoming of Guests and their Felicitations. Hon' Guests on Dias Inaugurated function by Lamp Lighting and Saraswati Pujan. Brief Introduction about Center of Excellence was given by me with Power Point Presentation at 11.30 am to 11.40 am. Center of Excellence Logo unveiling was done by Mr. Ram Bhogale, Chairman, Marathwada Auto Cluster, Aurangabad. Maan-Patra Reading was done by Dr. Y. V. Joshi and Handovering Maan-Patra to Dr. T. K. Basu, Former Professor, IIT, Kharagpur was done by Hon' Members on Dias during 11.45-12.00 pm. Short Journey of Center of Excellence in Audio Visual Format was done by the Research Scholars during 12.00 - 12.15 pm. This was followed by the MoU Signing between Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded and Indian Institute of Technology, Roorkee for Collaborative Research in Signal and Image Processing. Dr. A. U. Digraskar, Former Central Project Advisor, NPIU addressed the audience and gave information regarding Center of Excellence project by Govt. of India. Dr. M. D. Shivankar, Joint Director, DTE, Aurangabad congratulated SGGSIET for the establishment of state of the art laboratory, Center of Excellence in Signal and Image Processing. At 12.34 pm Dr. T. K. Basu, Former Professor, IIT, Kharagpur

Thanked the institute for Maan-Patra and Shared his experience with the institute and Guided students and faculty members with various project ideas in Signal and Image Processing. At 12.48 pm Mr. Ram Bhogale, chief Guest addressed audience and announced the official inauguration of Center of Excellence in Signal and Image Processing, He also congratulated the Director and faculty members for the center of excellence. He guided the audience and encouraged to develop entrepreneur skills along with the research. In Director's Address at 12.55 pm Hon' Director Congratulated the Coordinator and Faculty members for center of excellence and encouraged for the fruitful research in signal and image processing, followed by expressing of Vote of Thanks by Dr. S. N. Talbar.



This was followed by the ribbon cutting ceremony of the Laboratory with Center of Excellence visit and Research Scholars Project introductions. Left for Lunch break at 1.40 pm and assembled again for the advisory committee meeting at 3.00 pm.

**Outcome:** The State of the Art Laboratory open to all the Faculty Members, PhD and PG students working in Signal and Image Processing Research. Research Collaboration of the Institute with Indian Institute of Technology, Roorkee for joint Research.



# MoU Signed

## 1. MoU with University of Technology PETRONAS, Malaysia

### Objectives:

- Collaborative Research Work
- Joint Publications
- Student and Faculty Exchange
- Organizing International level Short Term Training Program and Workshops jointly.
- Joint Supervision of M.Tech/ PhD students.

**Faculty Members:** Dr. L. M. Waghmare, Dr. Y V Joshi, Dr. R. S. Holambe, Dr. S. N. Talbar, Dr. M. B. Kokare





### **Outcome of Visit:**

- MoU with UTP Malaysia for
  1. Collaborative Research Work
  2. Joint Publications
  3. Student and Faculty Exchange
  4. Organizing International level Short Term Training Program and Workshops jointly.
  5. Joint Supervision of M.Tech/ PhD students.
- Attended Two short courses on
  1. Statistical Inference theory and Practice and
  2. Advanced Imaging Techniques for Biomedical Applications.

Started initial Interaction with NTU Singapore for further research collaboration.

## **2.MoU with Tata Memorial Hospital**

MoU is signed between Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded and Tata Memorial Hospital (TMC), Dr. E Borges Road, Parel, Mumbai - 400012, an autonomous body owned, funded and under the administrative control of Department of Atomic Energy, Govt. of India.

### **Objectives:**

- Principal research cooperation shall be focused on to conduct joint/collaborative research and consultancy, in the areas of medical image processing like early stage cancer detection and diagnosis, imaging quantification of body composition in cancer patients etc. Also, validation of softwares being developed at SGGSI&T as part of research work.
- To collaborate to share and exchange information of National level projects between both the Parties for mutual benefit and knowledge enhancement. To increase the relevance of academic research (Joint guidance for Ph.D. and PG students), and product development initiatives.
- To facilitate interactions among experts, doctors, students and faculty members of both the parties.

### **Areas of Co-Operation:**

TMC and SGGSI&T as mutually agreed for sharing resources such as exchange of faculty members and scientists, Doctors (TMH) for delivering expert lectures, joint research work, joint publications, students training and project/dissertation work, etc.

### **Effect and Duration:**

For a period of three (3) years from the date of signing, extendable for further period.

**Co-ordinators:** Dr. S. N. Talbar (SGGSIE&T, Nanded), Dr. M. H. Thakur, Dr. Subhash Desai and Dr. Abhishek Mahajan (Tata Memorial Centre).

## **3. MoU with Zankariya Imaging Center Bombay**

MoU is signed between Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded and Dr. Jankharia's Imaging Centre, Bhaveshwar Vihar, 383 Sardar V P Rd, Opposite Vanita Vishram, Mumbai.

### **Objectives:**

- To collaborate to share and exchange information of National level projects between both the Parties for mutual benefit and knowledge enhancement.
- To effectively share the facilities like laboratories, library etc. and expertise for improving the capabilities for advanced education and research and undertakings, Industrial & Research Projects.
- To facilitate interactions among experts, doctors, students and faculty members of both the parties.
- Increase the relevance of academic research (Joint guidance for Ph.D. and PG students), consultancy and product development initiatives.
- To encourage training programs in cutting edge technologies, continuing education activities, skill development activities and subject up gradation workshops using the facilities and services of faculty members of both the parties for benefits of each other.
- To conduct joint/collaborative research and consultancy, in the areas of medical image processing for diffuse lung diseases. Also, validation of softwares being developed at SGGSI&T as part of research work

### **Areas of Co-Operation**

Dr. Jankharia's Imaging Centre and SGGSI&T as mutually agreed for sharing resources such as exchange of faculty members and scientists, Doctors (Dr. Jankharia's Imaging Centre) for delivering expert lectures, joint research work, joint publications, students training and project work, etc.

### **Effect and Duration:**

For a period of five (5) years from the date of signing, extendable for further period.

**Co-ordinators:** Dr. Sanjay N. Talbar and Dr. M. B. Kokare (SGGSIE&T, Nanded), Dr. Bhavin Jankharia, Dr. Parang Sanghavi and Ms. Pranita Mahajan (Jankharia's Imaging Centre)



## 4. MoU with ADCIS France

MoU is signed between Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded between, and ADCIS, France (Software Products and Custom Development in the Fields of Image Processing and Analysis).



### **Objective:**

- To make collaborative efforts to achieve goals of Centre of excellence in signal and image processing.
- Joint research in the area of signal and image processing.
- To seek for funding for National/International organizations to facilitate collaboration.
- Student internship and Faculty training.

### **Effect and Duration:**

For a period of three (3) years from the date of signing, extendable for further period.

**Co-ordinators:** Dr. M. B. Kokare (SGGSIE&T, Nanded) and Dr. Bruno Lay (ADCIS, France).

## 5. MoU for Retinal Image Analysis Research

The Memorandum of Understanding is signed between SGGS Institute of Engineering and Technology, Nanded and

- Dr. Girish Deshmukh's Eye Clinic, Sushrusa Hospital Building, Nanded
- Department of Ophthalmology, Shankarrao Chavan Government Medical College, Nanded

Few Research scholars and M. Tech students from the institute are working on automatic detection of diabetic retinopathy and retrieval system. Based on the reports of IDF, India is the top most country in the world, where a lot of people are suffering from Diabetic Retinopathy. Also, elimination of avoidable blindness in India is critically dependent on the pool of well-qualified ophthalmologists and supporting eye care infrastructure. Detecting abnormalities in the retina in a large number of images generated by screening programs, which need to be repeated at least annually, is very expensive. The proposed research is carried out to develop image analysis system that will automatically detect lesions such as micro-aneurysm, haemorrhage, hard exudates etc. in retinal image and further analyze its severity level by grading. This can reduce the treatment costs of patients and workload of ophthalmologists. As Indian Diabetic Retinopathy database is not available like foreign databases for research purpose. We took initiative to develop it. In this regard received help from both the hospitals as follows:

- The collection of images to create an indian database of diabetic retinopathy.
- Expertise for verification and marking of various lesions for creating ground truth.
- Clinical insights and guidance to channelize the work of automatic retinal image analysis.

### **Outcomes:**

1. Created new Diabetic Retinopathy Database with expert annotations.
2. Received guidance by means of expert lectures, sharing insights for the development of methods automatic retinal image analysis suitable for clinical practice.

**Co-ordinators:** Dr. M. B. Kokare (SGGSIE&T, Nanded), Dr. Girish Deshmukh (Susrusha Eye Clinic, Nanded) and Dr. Vivek Sahasrabuddhe (SCGMC, Nanded).



# Activities Conducted

## Activity 1: Two Week Short Term Training Program on “Statistical Inference and Linear Algebra”, 16<sup>th</sup> - 21<sup>st</sup> December 2013

### **Course Contents :**

Introduction to Probability, Random Variables, PDFs, CDFs, properties, Auto and Cross correlation, Moments and averages, Moment generating functions, modelling of the random experiment, Random processes, Estimation theory, Estimators- Need, types and models, Statistical inference, Hypothesis testing, Linear Algebra – Vector spaces, subspaces and their applications in Signal Processing

### **Facilitators:**

Prof. S. D. Joshi, Professor, IIT Delhi and

Dr. Sarat Chandra Dass, Associate Professor, UTP, Malaysia

### **Participants:** 50

1. External (Outside SGGS) : 15
2. Internal M. Tech Students : 25
3. Internal Faculty Members : 10

### **Proceedings of the Course :**

The Course is inaugurated by Prof. Shiv Dutt Joshi, Professor of Electrical Engineering IIT Delhi on 16<sup>th</sup> Dec 2013. On the same day he has introduced the concepts and motivation of Statistical Signal Processing. He step by step explained how to learn the subject of statistical Signal Processing and the contents therein. Starting from Probability, Random variables, Stochastic Processes, Moments, Moment Generating functions, LMS algorithm : Need and derivation and linear algebra touch to understand the concepts. From Second day onwards, Dr. Sarat Chandra Dass during 17<sup>th</sup> Dec 2013 to 21<sup>st</sup> Dec 2013, again strengthened the concepts of Probability, Random Variables, pdf, PDF, Joint PDFs, Sample examples of PDFs, and pdfs, their applications, Central Limit Theorem, Moments, Moment Generating functions, Modelling of random experiment, and then ended up in statistical inference, Different types of estimators, Hypothesis testing. He also held a few introductory lectures on Linear algebra, Spaces and subsaces, which were to be taken by Dr. Nidal, from UTP Malaysia who could not make it because his VISA not cleared by Indian Embassy in Malaysia.

All the participants actively participated in the process of learning the subject and made it interesting by asking lo of questions and discussed the issues with the course faculty.

The Course was held from 9.30AM to 5.30PM on all the days.

**Coordinators:** Prof. Y. V. Joshi and Prof. R. R. Manthalkar

## **Activity 2: Two Week Short Term Training Program on “Winter School on Biometrics for secured Authentication: Fundamentals and Advances”, 23<sup>rd</sup> - 27<sup>th</sup> December 2013**

Winter School on Biometrics for secured Authentication: Fundamentals and Advances was held during 23<sup>rd</sup> to 27<sup>th</sup> December 2013, organized by Department of Instrumentation Engineering. The winter school focused on bringing out new trends in Biometrics in various modalities such as Iris, Face, Fingerprint and Voice. Besides, the winter school also aimed to bring together researchers, scientists, engineers, academia and practitioners from industry to exchange and express their views, ideas, and insights about the facets of the Biometrics school. The primary objective of the school was to furnish a platform for young researchers to present their research and have interactions and in-depth discussions with their counterparts from all over India.



The winter school 2013 was scheduled from December 23, 2013 to December 27, 2013. The inaugural function of the school was held at 9:30AM on December 23, 2013. The inauguration accomplished in the presence of Chief guest Dr. Sumantra Dutta Roy, Dr. Sarat Chandra Dass Guest of honor, Dr. L. M. Waghmare Patron of the school, Dr. A. B. Gonde TEQIP coordinator, and Dr. R. S. Holambe Course coordinator. The inauguration was anchored by Ms. Roopali S. Biyani. The daily plan of the Winter School of four sessions (one and half hour each) in a day was scheduled in prior, and was executed accordingly.

**Participants:** 65 Participant in total, 27 from different parts of country like Karnataka, Himachal Pradesh, Chhattisgarh, Maharashtra, and 38 from Our institute including faculty members and MTech students of Instrumentation and Electronics engineering.



The School began with the session of Prof. Dr. Sumantra Dutta Roy from IIT Delhi. His focus was on various research methodologies on Fingerprint Analysis including different classifiers. The session continued from 10:00 AM - 11:45 AM. In the next session, Prof. Sarat Chandra Dass from Universiti Teknologi Petronas, Malaysia delivered a lecture on the Overview of Statistical Tools for Biometrics. He continued his talk for the rest of the day.



Second day of the school included the sessions on Hidden Markov Model, Gaussian Mixture Model and Performance measures of the biometric systems by Prof. S. C. Dass. Dr. S. G. Kanade from TSSM's BSCoER, Narhe, Pune and Dr. A. D. Rahulkar from AISSMSIoIT, Pune carried out alternate session for the third day of the school. Dr. S. G. Kanade focused on Performance Evaluation of Biometric Systems and Biometrics with Cryptography for Improved security, and Dr. A. D. Rahulkar focused on his expertise on Fundamentals and Advances on Iris Recognition System. Dr. Hemant A. Patil from (DA-IICT), Gujarat started the session for the fourth day on the Fundamentals of Speech Processing, and features for speaker recognition whereas Dr. S. V. Gangashetty from IIIT, Hyderabad carried out the next two sessions on Voice Biometrics. On last day of winter school, Dr. A.K. Ray, Vice-chancellor, BESUS (Kolkata) and Dr. T.K Basu from IIT Kharagpur delivered lectures on Fundamentals & Advantages of Pattern Recognition Techniques and Engineering Research in Biometrics respectively. Dr. R. S. Holambe delivered his lecture on Orthogonal Transforms and Face Recognition and made an emphasis on future extent in database management used for UIDAI Scheme and security systems in the concluding session.

**Co-ordinator:** Dr. R. S. Holambe

### **Activity 3: Workshop on “Medical Diagnostics”, 27<sup>th</sup> - 28<sup>th</sup> September 2014**

This workshop is aimed for the faculty members, PhD Research Scholars and M.Tech students, who are interested to build a research career in Medical Imaging. Participants from diverse backgrounds like Electronics, Instrumentation, Computer Science, and Electrical will get an exposure of the Diagnostic Imaging: MR and CT, MR Spectroscopy and Spectroscopic Imaging. Experts with experience in Medical Imaging and Experienced Radiologists will be called to elaborate various Medical Imaging concepts.

#### **Participants:**

28 M.Tech Students, 8 Researchers, 3 Faculty members = Total 39.

#### **Facilitators:**

Dr. Ajay V. Deshmukh, Principal DACOE, Karad

Dr. Abhijit Pawar, Nucleus Diagnostic Centre, Pune



**Coordinator:** Dr. S. N. Talbar

## **Activity 4: One Week Short Term Training Programme on “Wavelets and its Applications”, 8<sup>th</sup> - 12<sup>th</sup> December 2014**

Six experts from host institute, one expert from IIT Bombay and One expert form DAIICT, Gandhinagar, has conducted this training programme. This mission of this training programme was to explore new directions in the fields of signal/ image processing and wavelet analysis. The STTP on wavelets was tutorial flavor and hands on experience to participants who are not necessarily wavelet experts.

### **Participants:**

There were in total 75 participants. Out of that 30 faculty members, fourteen research scholars, twenty five M.Tech students, two M.Phil students and four B.E./B.Tech students of different universities from different parts of India.

### **Facilitators:**

6 from Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded

1 form Indian Institute of Technology, Bombay

1 from Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar.

### **Workshop objectives:**

1. Introduction to Wavelets.
2. Application of Wavelets in Signal and Image Processing.
3. Practical Implementation of Wavelets (2-band, M-band and Gabor Wavelet).
4. Learning interpretation of Mathematical Equations.

On day 1, Training programme started at 9:30 am with small function of 30 minutes of inauguration. Dr. Pandit Vidyasagar, Vice – Chancellor, Swami Ramanad Teerth Marathwada University, Nanded was chief guest for this function. In the first session which was from 11:15 am to 12:45 pm, I gave brief note on fundamentals of wavelets. I also explained participants about the use of wavelets as a tool for signal and image processing. In the second session which was from 1:45 pm to 3:15 pm, I introduced participants to continuous and discrete wavelet transform. After tea break Prof. Sudhir Ghorpade delivered the lecture on linear algebra and vector spaces between 3:30 pm to 5:30 pm.





On Day 2 session started at 9:30 am, I gave a talk on the implementation of one dimensional and two dimensional wavelets for about one and half hours and explained the practical implementation of wavelets so that participants could be able to use wavelets in there research . In the second session between 11:15 am to 12:45 pm, Dr. S. N. Talbar gave lecture on Multiresolution Analysis and applications. In the third session from 1:45 pm to 3:15 pm Dr. R. S. Holambe gave light on application of wavelets in biometrics. In the last session between 3:30 pm to 5:30 pm, I along with Dr. S. N. Talbar took hands on session on implementation of two band wavelet in the computer laboratories using Matlab software.





On Day 3 in morning session between 9:30 am to 11 am, I gave lecture on M-Channel and Rotated wavelet by highlighting the advantages of them over standard wavelets and explained how retrieval efficiency could be improved using M-channel Wavelets. In the second session between 11:15 am to 12:45 pm, Dr. R. R. Manthalkar gave lecture on Gabor wavelets by stating advantages of gabor wavelets over standard wavelets and their use in texture analysis. In the third session from 1:45 pm to 3:15 pm Dr. S. V. Bonde gave lecture on application of wavelet in signal estimation. The last session of day was hands on session in computer laboratories where I and Dr. S. N. Talbar explained practical implementation of M-Channel wavlets by giving implementation of 3-channel wavelet as an assingment.

On Day 4, Dr. Hemant Patil gave lecture for first three sessions on Time frequency analysis and estimation of instantaneous frequency then succeeded by himself for design of spline wavelets and wavelets and its application in speech processing. In the last session Dr. Hemant Patil, I and Dr. S. N. Talbar took lab session of implementation of Gabor Wavelet.

On Day 5, I gave lecture on Dual tree complex and Rotated wavelet, application of wavelet in CBIR and concluded with talk on beyond wavelets i.e. Ridgelet and Curvelet and its application. In the last session, Dr. R. R. Manthalkar expressed his views on improving efficiency at workplace and learning joyfully.

**Outcome:**

Participants were able to understand the concept of wavelet as a tool and do its implementation which will help them in research and use of it in different applications.

**Coordinator:** Dr. M. B. Kokare



## **Activity 5: One-Day Workshop on “EEG Acquisition and Analysis”, 13<sup>th</sup> December 2014**

Two experts from host institute, one expert from Vidya Pratishthan’s College of Engineering, Baramati, has conducted this workshop. The objective of this Workshop was to explore new directions in the fields of EEG analysis. The Workshop was given an opportunity to learn EEG acquisition and analysis by doing hands on experiments.

### **Participants:**

There were in total 25 participants, out of that 05 faculty members, 10 research scholars, and 10 M.Tech and B.Tech students of our Institute.

### **Facilitators:**

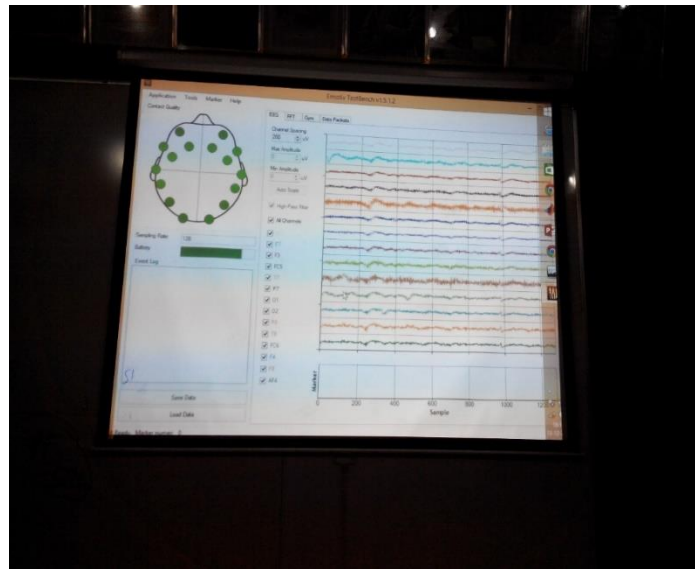
2 from Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded

1 from Vidya Pratishthan’s College of Engineering, Baramati

### **Workshop objectives:**

- Interaction with expert in the area of EEG Acquisition and Analysis
- Understanding International 10-20 system scalp electrodes
- Getting problems based on EEG Acquisition and Analysis

Workshop started at 10:30 am with small function of 15 minutes of inauguration. Dr. L. M. Waghmare, Director of our Institute was chief guest for this function. In the first session which was from 10:45 am to 12:15 pm, Dr. R. R. Manthalkar gave brief note on fundamentals of Interpersonal Neurobiology. In the second session which was from 12:15 pm to 01:00 pm, I introduced participants working and basic concepts of EEG. After lunch break Prof. Shashank Birajdar delivered the lecture Brain Computer Interface between 2:00 pm to 3:00 pm. In second session after Tea break between 3.30 pm to 5.00 pm, Mr. Shashank Birajdar explained by doing hands on experiments EEG Acquisition using Emotive EPOC device so that participants could be able to use device in there research.



**Outcome:**

Participants were able to understand the basic concepts of EEG acquisition, International 10-20 system scalp electrodes, working of EEG Acquisition device Emotive EPOC, which will help them in research and use of it in different applications.

**Coordinator:** Dr. Suhas S. Gajre

## **Activity 6: One Day Expert Lectures on “Intellectual Property: Patents”, 26<sup>th</sup> December 2014**

An experts expert from CSIRs URDIP- Pune, Dr. Mohan G Kulkarni, Emeritus Scientist URDIP Pune also Retired as Head Polymer Science and Engineering Division National Chemical laboratory Pune Academic Qualifications : Ph.D. (Tech.) (Polymer Science)(1981) with honours received as: Awarded Young Associateship of the Indian Academy of Sciences, Bangalore (1984), Fellow of the Maharashtra Academy of Sciences (1990) Fellow of the Indian Academy of Sciences, Bangalore (1996), IPI-UDCT Diamond Jubilee Visiting Professor in Polymer Processing (1997), KG Naik Gold medal (1999), Fellow Indian National Academy of Engineering (2005), Bombay and one expert form DAIICT, Gandhinagar delivered expert talk in this training programme. The expert had more than 80 publications in international journals. High experience in filing patents. He has filed more than 50 International patent applications of which 25 are granted. His Research Interests are Design and synthesis of novel polymer architectures, Supramolecular polymer science, Molecular recognition in polymers, Controlled release technology, Hydrogels for biomedical applications. His current Current Interests are Research and technology management and Intellectual property management. The resource person had enriched the participants on the topics like

Session 1: Power of Patents and what are Patents,

Session 2: How to file patents,

Session 3: Patent Prosecution and Compliance

Session 4: University patenting and

Session 5: Business strategies for inventors.

### **Participants:**

There were in total 41 participants. Out of which 12 were faculty members of host institute; three were research scholars, four were M.Tech students, 18 were UG students (four, ten, four were respectively were from first year, third year, fourth B.Tech students) of various branches. Out of 41 participants 3 were from faculty members from MGMs college of Engineering, Nanded. One of the participants was a contractor for reliance Telecommunication Cables.

### **Facilitators:**

Dr. Lenina V. Birgale, Dr. M. B. Kokare and Dr. S.S. Gajare, all from Department of Electronics and Telecommunication Engineering.

**Objective:** The main aim of this training programme was to introduce the audience to explore new directions in the fields of Intellectual Property: Patents.

**Lecture objectives:**

1. Introduction to various Intellectual Properties.
2. Application of IP to inventions.
3. Motivate inventors and create awareness of IP.

**Outcome:**

Participants were enabled to understand the concept of intellectual property and its potential for commercialization and societal use.



**Workshop Coordinator:** L. V. Birgale



## Activity 7: Two Day's Workshop on "Probability, Statistics and Random Processes" , 28<sup>th</sup> February and 1<sup>st</sup> March 2015

An Expert from Indian Institute of Technology, Jodhpur has conducted the workshop. The mission of this workshop was to explore concepts of probability, statistics and random processes to use them in the fields of signal/ image processing. The workshop on probability was tutorial flavor to participants who are from engineering background.

### Participants:

There were in total 66 participants. Out of that twenty two faculty members, twenty research scholars, twenty four M.Tech students of different departments of the organizing Institute.

### Facilitator:

Dr. Vivek Vijayvargiya from Indian Institute of Technology, Jodhpur.

### Workshop objectives:

1. Introduction to Probability, Statistics and Random Processes.
2. Application of Probability and Statistics in Signal and Image Processing.
3. Learning interpretation of Mathematical Equations/ Graphs particularly from Statistics.

**On day 1**, Workshop started at 9:30 am with small function of 15 minutes of inauguration. Dr. L. M. Waghmare, Director, Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded was chief guest for this function. In the first session which was from 09:45 am to 11:00 am, Dr.



Vivek Vijayvargiya gave brief note on basics of Probability Theory. After tea break, in the second session which was from 11:15 am to 12:45 pm, he explained participants about the use of probability theory in signal and image processing with lots of real life examples. After the lunch break of one hour session began at 1:45pm with introduction to random variables and their distribution which



followed by short break of 15 minutes at 3:15. Dr. Vivek delivered the lecture on function of random variable between 3:30 pm to 5:30 pm.

**On Day 2**, session started at 9:30 am, Dr. Vivek Vijayvargiya gave a talk on the Joint and conditional distributions for about one and half hours. In the second session between 11:15 am to 12:45 pm, He discussed the applications of previously taught concepts so that participants could be able to use them in their own research applications. After the lunch break of one hour, in the third session from 1:45 pm to 3:15 pm he gave light on Statistics. In the last session between 3:30 pm to 5:30 pm, He explained covariance matrix and its applications.



**Outcome:**

Participants were able to understand the concept of probability and statistics which will help them in research and use of it in different applications.

**Coordinators:** Dr. A. R. Patil and Dr. M. B. Kokare

## **Activity 8: Three Day's Workshop on "Computer Literacy", 25<sup>th</sup> - 27<sup>th</sup> March 2015**

Ten research scholars and three technical assistants from the host Institute, has conducted this training programme. This mission of this training programme was to introduce basics of computer and its effective use to the primary school teacher's from rural areas in Nanded district. The workshop on Computer Literacy was conducted in the computer lab with parallel theory session and its practical implementation of the taught topic.

### **Participants:**

There were in total 45 primary school teachers from rural areas in Nanded district as participants.

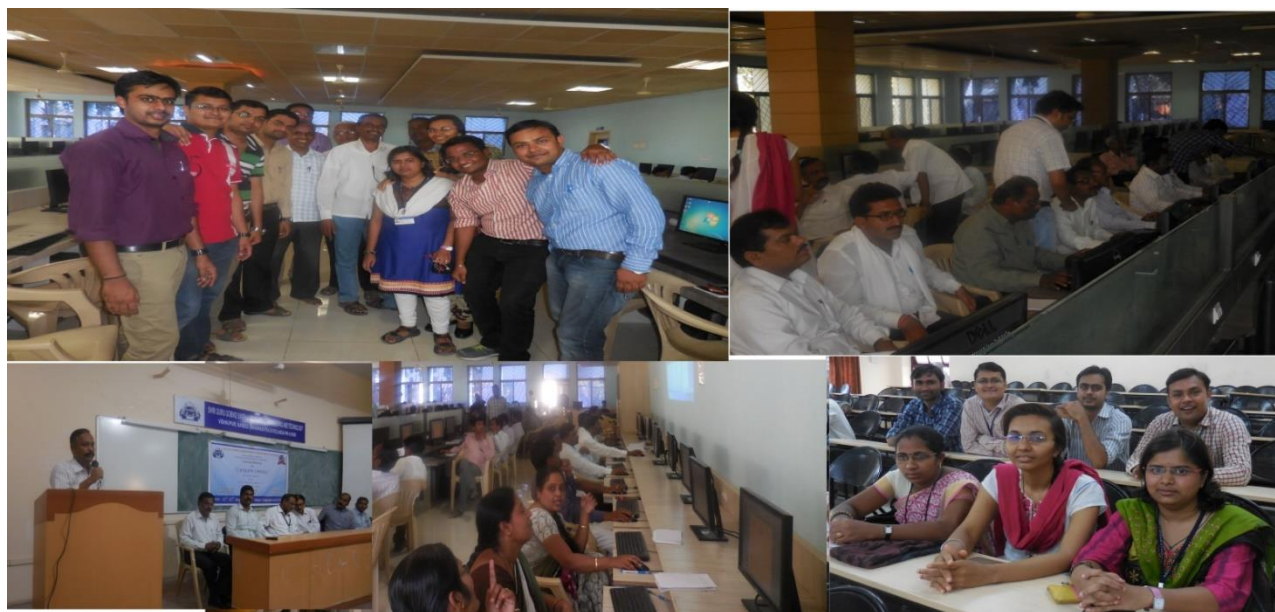
### **Facilitators:**

Ten Research Scholars and three Technical Assistants from Shri Guru Gobind Singhji Institute of Engg. & Tech., Nanded

### **Workshop objectives:**

1. Introduction to Computer, Input/ Output Devices.
2. Use of Microsoft Office – Word, Excel, and PowerPoint.
3. Introduction and use of Internet, E-commerce and Necessary softwares.
4. Effective use of Google Chrome.

On day 1, Training programme started at 09:30 am with function of one hour of inauguration and introduction of participants. Honorable Director of the host institute, Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded was chief guest for this function. In the first session which was from 11:15 am to 12:45 pm, Ravi Kamble and Prasanna Porwal gave brief note on fundamentals of computers. They also explained participants about the use different input and output devices of the computer. In the second session which was from 1:45 pm to 3:15 pm, Ganesh Singadkar and Manjiri Ranjanikar introduced participants to Microsoft Office Word with some simple practice examples. After tea break Ravi Kamble and Mukund Nagare continued the session of Microsoft Office Word with giving exposure to participants about shortcut commands and some other examples between 3:30 pm to 5:30 pm.



On Day 2, Session started at 9:30 am, Hemprasad Badgajar and Mukund Nagare continued the talk Microsoft Office Word with few examples extending the previous ones for about one and half explained the practicality of MS-Word so that participants could be able to use word in there official work. In the second session between 11:15 am to 12:45 pm, Hemprasad Badgajar and Aditya Nilawar gave introduction to MS Office-Excel. In the third session from 1:45 pm to 3:15 pm, Supreet Bansod and Piyush Asolkar gave talk on understanding of tools such as functions, graphs and application of MS Office-Excel. In the last session between 3:30 pm to 5:30 pm, Supreet Bansod and Piyush Asolkar told the how to do formatting using excel with examples such as mark sheet generation.

On Day 3 in morning session between 9:30 am to 11 am, Akash Gandhamal and Aditya Nilawar gave talk on MS-Office PowerPoint and its use with parallel examples for the hands on experience. In the second session between 11:15 am to 12:45 pm, Akash Gandhamal and Sujata Wankhade continued session of MS-Office PowerPoint with more insights and fine examples. In the third session from 1:45 pm to 3:15 pm Sujata Wankhade and Manjiri Ranjanikar gave lecture on Internet, E-commerce and necessary softwares with practical demonstration of online banking, purchase of goods from E-stores etc. The last session of day was taken by Prasanna Porwal and Ganesh Singadkar on the effective use of google chrome.

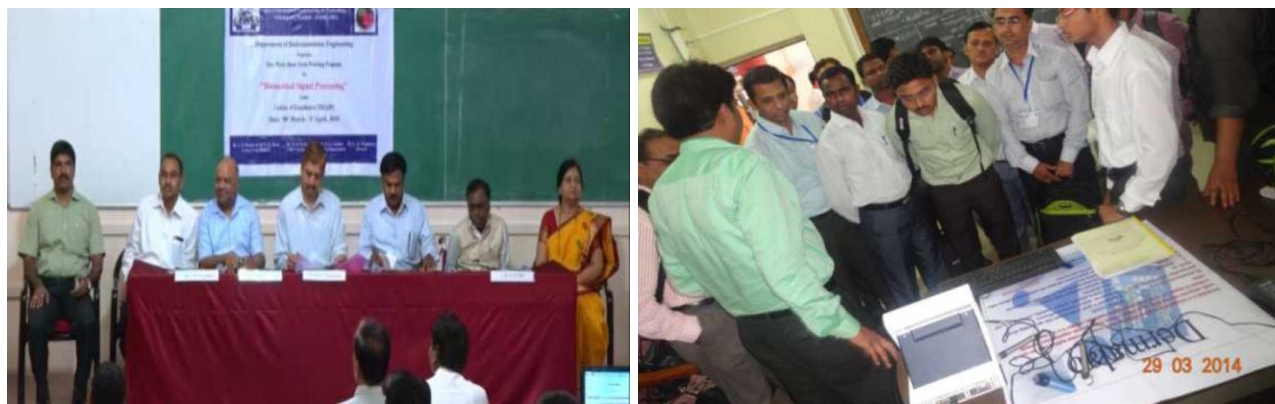
### **Outcome:**

Participants were able to understand the computer well with the use of MS-Office Word, Excel, and PowerPoint. They also understood the use of internet, e-commerce and use of Google chrome.

**Coordinator:** Late. Mr. G. M. Shinde

## Activity 9: One Week Short Term Training on “Biomedical Signal Processing” 30<sup>th</sup> March - 3<sup>rd</sup> April 2015

One week Short Term Training Programme (STTP) on **Biomedical signal Processing** was held during March 30<sup>th</sup> to April 3<sup>rd</sup> 2015, organized by Department of Instrumentation Engineering. These five days STTP included talks on various aspects of Biomedical Signal Processing and study of the recent trends in research areas of this field by the interaction with numerous experts from different parts of country. This STTP mainly aims to explore the methods to extract the useful information from physiological signals and strengthen the bond between academic & ongoing medical research. Eminent speakers and experts from IIT's and renowned institutes glorified the STTP. The STTP was scheduled from March 30, 2015 to April 3, 2015. The inaugural function of the school was held at 10.00AM on March 30, 2015. The inauguration accomplished in the presence of Chief guest Dr. Vinod Kumar, Dr. Ranjan Maheshwari & Dr. A. G. Patil as Guests of honor, Dr. L. M. Waghmare Director of the Institute, Dr. M. B. Kokare, CoE coordinator, and Dr. S. T. Hamde & Dr. Mrs. V. R. Thool Course coordinator. The inauguration was anchored by Ms. Roopali S. Biyani, Faculty of Department of Instrumentation Engineering. The daily plan of the STTP of four sessions including hands on practical sessions in a day was scheduled in prior, and was executed accordingly.



**Participants:** 84 Participants in total, 35 from different academic institutes and 49 from our institute including Faculty members, Research Scholars and M.Tech students actively attended the STTP.

**Outcome:** The participants were satisfied with the content of workshop and it provided guidelines for further research work.

**Coordinators:** Dr. S. T. Hamde and Dr. Mrs. V. R. Thool.

## **Activity 10: Two Day's Workshop on "Effective Research Methodology" 11th - 12<sup>th</sup> April 2015**

One expert from the host institute has conducted this workshop. The main aim of this workshop was to guide the students from M.Tech and PhD about research methodology and if they follow certain guidelines they can do research more effectively.

### **Participants:**

There were in total 58 participants. Out of that 25 faculty members, 14 research scholars, 15 M.Tech students and 4 B.Tech students from different parts of Maharashtra.

### **Workshop objectives:**

1. Why and How to do Research?
2. Literature Survey and Problem Formulation.
3. Data Collection and Sampling Techniques.
4. Generating Research Ideas, Research Ethics.
5. Effective way of writing best research paper, Presenting paper, Thesis writing and Preparing for PhD viva.

On day 1, Workshop started at 9:30 am with small function of 30 minutes of inauguration. Dr. L. M. Waghmare, Director, SGGS Institute was chief guest for this function. In the first session which was from 10:00 am to 11:30 am, I gave brief note on Why to do research. In the second session which was from 11:45 am to 1:00 pm, I introduced participant's different ways of doing research. After lunch break, I delivered the lecture on Literature Survey and Problem Formulation between 2:00 pm to 3:30 pm and then from 3:45pm to 5:00pm, I explained different data collection and sampling techniques.

On Day 2, session started at 10 am, I gave a talk on "How to generate research ideas?" for about one and half hours. In the second session between 11:45 am to 1:00 pm, I told participants the effective ways of writing research paper. In the third session from 2:00 pm to 3:45 pm, I shared different research ethics and views on effective way of presenting paper. Between 4pm to 5pm, I discussed the effective way of thesis writing and preparing for PhD viva.

### **Outcome:**

Participants were able to understand the research ethics and can follow them in their research work to make it more effective.

**Co-ordinator:** Dr. M. B. Kokare



## **Activity 11: One Day Workshop on Intellect Creation and Protection for Image Processing, 25<sup>th</sup> April 2015**

One expert from Tata Consultancy Services Pune and one from the host institute has conducted this workshop. The main aim of this workshop was to guide the students from B.Tech, M.Tech and PhD about intellectual property management and if they follow certain guidelines they can protect their ideas which can help them in future.

### **Participants:**

There were in total 29 participants. Out of that 13 faculty members, 9 research scholars, 1 M.Tech student and 6 B.Tech students from the institute.

**Facilitators:** One from Corporate IPR Group, Tata Consultancy Services, Pune and other one from Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded

### **Workshop objectives:**

1. How to protect intellect generated during research?
2. Why and How to Patent data for research?
3. IP Protection at SGGS.
4. Intellect protection in Image Processing.

On day 1, Workshop started at 10:15 am with small function of 15 minutes of inauguration. Dr. L. M. Waghmare, Director, SGGS Institute was chief guest for this function. In the first session which was from 10:30 am to 11:30 am, I gave brief note on how to protect intellect generated during research. In the second session which was from 11:30 am to 12:30 pm, Mr. Nilesh Pandit gave introduction to the use of patent data for research. After lunch break, I delivered the lecture on IP protection at SGGS and discussed invention disclosure form with participants between 1:30 pm to 2:30 pm and then from 2:30 pm to 3:30 pm, Nilesh Pandit explained “How to do patentability search and How to search patents with different web sources available?”. After a short tea break of 15 minutes, session started at 3:45 pm, I gave a talk on “How to decide the patentability of research?” for about one hour. In the next session between 4:45 pm to 5:45 pm, Mr. Nilesh Pandit guided the participants through different ways of intellect protection to software and algorithms.

### **Outcome:**

Participants were able to understand the importance of patent document for research and the ways of protecting the software and image processing techniques.

**Coordinator:** Dr. L. V. Birgale

## **Activity 12: Two Week Short Term Training Program on “Mathematical and Statistical Foundation to Signal and Image Processing”, 28<sup>th</sup> May to 6<sup>th</sup> June 2015**

An Expert from Indian Institute of Technology, Jodhpur has conducted this training program. The mission of this training program was to explore concepts of probability, statistics and random processes to use them in the fields of signal/ image processing. The training programme was very comprehensive and began with very basics of statistics and took participants at advanced level to bring them in a position to use these techniques in their area of research. Focus was given to the research problems in Signal and Image Processing.

### **Participants:**

There were in total 41 participants. Out of that thirty faculty members, eight research scholars, Three B.Tech students of different departments of the organizing Institute and other Institutes/ Universities from Maharashtra.

### **Facilitator:**

Dr. Vivek Vijayvargiya from Indian Institute of Technology, Jodhpur.

### **STTP Objectives:**

1. Introduction to Probability, Statistics and Random Processes.
2. Application of Probability and Statistics in Signal and Image Processing.
3. Learning interpretation of Mathematical Equations/ Graphs particularly from Statistics.

**On day 1**, Workshop started at 10:45 am with small function of 15 minutes of inauguration. Dr. L. M. Waghmare, Director, Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded was chief guest for this function. In the first session which was from 11:00 am to 12:45 am, Dr. Vivek Vijay gave brief note on basics of Probability Theory. After lunch break of one hour, in the second session which was from 1:45 am to 2:45 pm, he explained participants about the use of probability theory in signal and image processing with lots of real life examples. After the tea break of 15 minutes, session began at 3:00pm with introduction to random variables and their distribution.

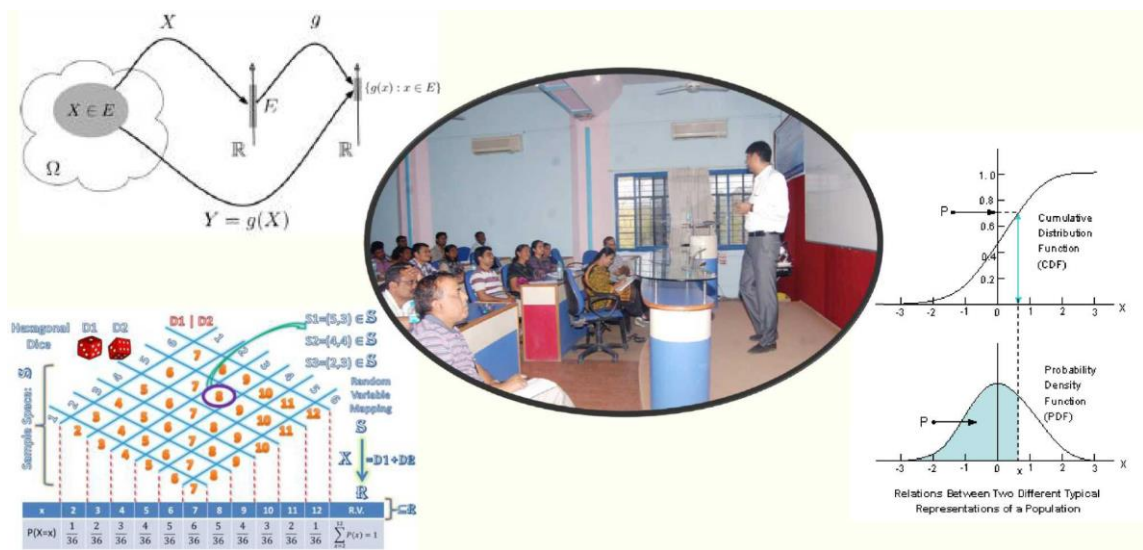
**On Day 2**, session started at 9:30 am, Dr. Vivek Vijay gave a talk on the Joint and conditional distributions and their properties for about one and half hours. In the second session between 11:15 am to 12:45 pm, He discussed the applications of previously taught Bernoulli, Binomial, Poisson and Geometric Distribution concepts so that participants could be able to use them in their own research applications. After the lunch break of one hour, in the third session from 1:45 pm to 2:45 pm he gave light on Uniform, Gamma, Exponential, Chi-square and Beta Distribution. After the tea break of 15 minutes, in the last session between 3:00 pm to 5:00 pm, He summarized all the previously taught distributions and discussed their applications.

**On Day 3**, session started at 9:30 am, Dr. Vivek Vijay gave a lecture on Moments and application for about one and half hours. In the second session between 11:15 am to 12:45 pm, He discussed Moment Generating function and Characteristic function. After the lunch break of one hour, in the third session from 1:45 pm to 2:45 pm he gave light on Transformation of Random Variable. After the tea break of 15 minutes, in the last session between 3:00 pm to 5:00 pm, He gave solution to the assignment given to all the participants.



**Day 4** was given as a holiday.

**On Day 5**, session started at 9:30 am, Dr. Vivek Vijay spoke on Normal/ Gaussian distribution with its applications in different fields throughout the day.



**On Day 6**, session started at 9:30 am, Dr. Vivek Vijay gave a talk on Joint and Marginal Distributions for about one and half hours. In the second session between 11:15 am to 12:45 pm, He discussed Conditional distribution and Independence of Random Variables. After the lunch break of one hour, in the third session from 1:45 pm to 2:45 pm he gave light on Moments, Correlation and Covariance. After the tea break of 15 minutes, in the last session between 3:00 pm to 5:00 pm, He gave lecture on Conditional expectation followed by solution to the another assignment given to all the participants.

**On Day 7**, session started at 9:30 am, Dr. Vivek Vijay spoke on Multivariate Normal/ Gaussian distribution (Bi-variate Normal, Conditional and Marginal, Linear Regression as Conditional Expectation, Covariance Matrix) with its applications in different fields throughout the day.

**On Day 8**, session started at 9:30 am, Dr. Vivek Vijay gave a lecture on Random sample and sampling distributions for about one and half hours. In the second session between 11:15 am to 12:45 pm, He discussed Methods of Point Estimation. After the lunch break of one hour, in the third session from 1:45 pm to 2:45 pm he gave light on Interval Estimation. After the tea break of 15 minutes, in the last session between 3:00 pm to 5:00 pm, He summarized all the previously taught topics and their applications.

**On Day 9**, session started at 9:30 am, Dr. Vivek Vijay discussing applications of probability and statistics in different fields till the tea break of 15 minutes at 2:45. After tea break short valedictory function was held and certificates were distributed to participants on their successful completion of training program.

**Outcome:**

Participants were able to understand the concept of probability and statistics which will help them in research and use of it in different applications.



**Coordinators:** Dr. A. R. Patil and Dr. M. B. Kokare



## **Activity 13: Indian Conference on Signal and Image Processing “ICONSIP 2015”, 10<sup>th</sup> -11<sup>th</sup> July 2015**

Indian Conference on Signal and Image Processing- (IConSIP-2015) brought together an interdisciplinary group of professionals working in the field of Signal and Image Processing, Electronics & Telecommunication, Instrumentation & Control, Computing and Informatics Technologies. Shri Guru Gobind Singhji Institute of Engineering and Technology Nanded had organized a two day “Indian Conference on Signal and Image Processing- (IConSIP-2015)” under Center of Excellence in Signal and Image Processing. The scope of IConSIP-2015 was to provide a national forum for exchange of ideas among interested researchers, students, developers, and practitioners in the areas of signal processing, image processing, computing, communications, and informatics. Overall, it provided educational and informative updates on key domains of Engineering and Technology.

### **Guests and Keynote Speakers:**

Dr. P. B. Vidyasagar, Vice-Chancellor, SRTM University, Nanded.  
Dr. Arun K Pujari, Computer Science at the University of Hyderabad, Hyderabad.  
Dr. Parag Kulkarni, CEO, EKLaT Research Lab, Pune.  
Dr. S. D. Joshi, Professor, IIT Delhi.  
Dr. B. H. Shekhar, Associate Professor, Mangalore University, Mangalore.

### **Patron:**

Dr. Laxman M. Waghmare, Director, SGGSI&T, Nanded.

### **Conference Convener:**

Dr. Ravindra C. Thool, Professor, Department of Information Technology.

### **Session Chairs:**

Dr. K. K. Bhoyar, Professor, Yeshwantrao Chavan College of Engineering, Nagpur.  
Dr. Thippeswamy G., Professor, B. M. S. Institute of Technology, Bangalore.  
Dr. G. V. Chowdhary, School of Computational Sciences, S.R.T.M.U.N, University.  
Dr. S.S. Gajre, Professor, SGGSI&T, Nanded.  
Dr. S.G. Kejgir, Associate Professor, SGGSI&T, Nanded.  
Dr. M. B. Kokare, Coordinator Center of Excellence (S&IP) SGGSI&T, Nanded.  
Dr. A. V. Nandedkar, Associate Professor, SGGSI&T Nanded.

### **Participants:**

There were in total 35 participants of different Academic Institutes/ Universities from India.

### **Organizing Committee:**

Dr. S.N. Talbar	Dr. Y.V Joshi	Dr. B.M. Patre	Dr. U.V. Kulkarni
Dr. R.S. Holambe	Dr. D.D Doye	Dr. S.T. Hamde	Dr. M.P. Rajurkar
Dr. S.V. Bonde	Dr. R.R Manthalkar	Dr. L.V. Birgale	Dr. A.B Gonde
Dr. A.R. Patil	Dr. V. R. Thool		

### **The main objectives for conference were the following:**

1. To promote best practices in aspects of Signal Processing, Image Processing, Electronics & Telecommunication, Instrumentation & Control, Computing and Informatics Technologies..
2. Recognize and discuss the multidiscipline determinants of challenges in engineering and technologies. Participation of researchers and educators from a wide range of professional disciplines in knowledge transfer. Share knowledge and common experiences with others working in the conference domain.

### **Inauguration cum Opening Ceremony**



IConSIP 2015 was commenced with the lighting of the lamp by a group of dignified persons as Honorable Dr. P. B. Vidyasagar , Vice-Chancellor, SRTMU Nanded, Dr. Parag Kulkarni, CEO, EKLaT Research Lab Pune, Dr. S. D. Joshi, Professor, IIT Delhi, Dr. K. K. Bhojar, Professor, Yeshwantrao Chavan College of Engineering, Nagpur., Dr. G. V. Chowdhary, School of Computation, S.R.T.M.U.N, University, Dr. B. M. Dabade I/C Director SGGSSIE&T Nanded, Dr. M. B. Kokare, Professor and Co-ordinator of Center of Excellence (Signal and Image Processing),

SGGSIE&T Nanded , Dr. A. V. Nandedkar, Professor and Coordinator of TEQIP II, SGGSIE&T Nanded., Dr. Ravindra C. Thool Professor, SGGSIE&T Nanded on 10th July 2015.



Conference Convener Dr. Ravindra C. Thool formally welcomed all the dignitaries on the dais and participants from the various parts of the country, colleagues, guests and students. He made audience aware about the IConSIP 2015 Conference objectives. The opening ceremony included speeches by dignitaries starting with chief guest Dr. P. B. Vidyasagar, Vice- Chancellor, SRTMU Nanded followed by Dr. Parag Kulkarni, CEO, EKLaT Research Lab Pune, Dr. S. D. Joshi, Professor, IIT Delhi, Dr. B.M. Dabade I/C Director SGGSIE&T Nanded, Dr. M. B. Kokare, Professor, SGGSIE&T Nanded, Dr. Ravindra C. Thool, Professor, SGGSIE&T Nanded.



### **Key Note Ceremony summary**

On first day first key note speech given by Dr. S. D. Joshi , Professor from Indian Institute of Technology, Delhi on Versatility of Multi-rate Banks in domain of Signal Processing. Second key note speech was given by Dr. Parag Kulkarni, CEO of the EKLaT Research Lab, Pune on the topic of Machine Learning and Machine Vision in computer and informatics domain.

On Second day first key note speech was given by Dr. B. H. Shekhar, Associate Professor from Mangalore University on topic “Role of computer vision and local/ global descriptors for Computer Vision Application” and second key note speech given by Dr. A. K. Pujari, Professor from University of Hyderabad, Hyderabad on topic of Multiclass Classification using SVM.

### Prize distribution and Valedictory Ceremony



Prize distribution and valedictory Ceremony started with felicitating Dr. B. H. Shekhar, Associate Professor, Mangalore University, Mangalore and Dr. Thippeswamy G., Professor, B. M. S. Institute of Technology, Bangalore followed by their speeches and prize distribution to the best paper awardees. Best paper awards were given to the papers namely “*Data Driven Approaches for Pronunciation Adaptation Modeling in ASR systems*” presented by Akella Amarendra Babu, Ramadevi Yellasiri and Akepogu Ananda Rao, CSE Department Jawaharlal Nehru Technological University Anantapur, Anantapuramu, Andhra Pradesh, India. , “*Optical Character Recognition for Handwritten Devanagari Script focused on Segmentation*” presented by Sapna B. Kamble and Madhav V. Vaidya, Department of Information Technology, SGGSE&T, Nanded, “*Robust Iris Recognition for Person Identification*” presented by Usha R. Kamble, Assistant professor, SGGSE&T and Dr. L. M. Waghmare, Director, SGGSE&T Nanded., “*Android based Electrocardiogram signal acquisition and display*” presented by R. K. Kanhe, Dept. of ETC, M.I.T., Satara, Aurangabad. S. T. Hamde, Professor, Dept. of Instrumentation Engineering, S.G.G.S.I.E.T, Nanded.

In the end, Dr. R. C. Thool offered a vote of thanks to all including Dr. B. M. Dabade, I/C Director SGGSE&T and Dr. Laxman M. Waghmare Director, SGGSE&T, Nanded without whom this event wouldn't have been possible. He thanked all the invited guests for gracing the occasion by their solemn presence and to all the participants of the IConSIP 2015 who were the main ingredient of this Conference. He also thanked Center of Excellence (Signal and Image Processing) for providing all kind of facility to conduct such Conference in the Institute.



**Outcome:**

We provided a national forum for exchange of ideas among interested researchers, students, developers, and practitioners in the key areas of computing, communications, and informatics. The IConSIP 2015 has addressed key topics and issues related to key aspects of Signal and Image Processing, Electronics & Telecommunication, Instrumentation & Control, Computing and Informatics Technologies.

**Conference Convener:** Late. Dr. Ravindra C. Thool



## **Activity 14: One Week Short Term Training Program on “MATLAB in Research and Data Analytics”, 2<sup>nd</sup> - 7<sup>th</sup> May 2016**

Looking at the need of M.Tech Students and Research Scholars Department of Information echnology has organized One Week STTP on Matlab in Research and Data Analytics from May 2- May 7, 2016 sponsored by Center of Excellence in Signal and Image Processing. We received huge response to the course from all over maharashtra.

**Participants:** The total number of participants registered: 122.

Total inflow (IRG) generated Rs. 1,59,000/-

Dr. U. S. N. Raju, Associate Professor, NIT warangal was chief guest and key note speaker for the Inaguration Program. Matlab basics were covered in first two days by Dr. B. M. Patre, Professor and Head, Department of Electrical Engineering, SGGSIET, Nanded. On third day, Mr. J. Premkumar from Capricot technology, Hyderabad delivered hands-on sessions on Computer vision toolbox. Mr. Sanjeev Kubakkaddi, well-known enterprenur from ITIE Academy, Bangalore conducted hands-on sessions on Image processing toolbox and related research areas using MATLAB. Fourth day, we had session on Neural Networks toolbox by Dr. U. V. Kulkarni, Professor, Department of Computer science and Engineering, SGGSIET, Nanded. Participants had immersive experinece in Neural networks with his session. Last day was concluded with Report writing in LATEX by Mr. Pandurang Londhe and Mr. G. K. Pakle. We also conducted Course examination on Fifth day and awarded pendrives as prizes to winners.

The contents delivered are:

1. Working with the MATLAB user interface
2. Analyzing vectors and matrices
3. Visualizing vector and matrix data
4. Working with data files
5. Complex Numbers, Matrices, Arrays
6. Functions, Plots, 2D-3D Plots
7. Automating commands with scripts
8. Writing programs with logic and flow control
9. Matlab for computer vision, Image processing, Neural Networks
10. Report Writing with Latex.

**Coordinators:** Mr. Ganesh Pakle and Mr. Madhav Vaidya

## **Activity 15: Two Week Short Training Program on “Computer Vision and Pattern Recognition”, 13<sup>th</sup> - 23<sup>rd</sup> July 2016**

The two week STTP included talks on various aspects of computer vision and pattern recognition and study of the recent trends in research areas of this field by the interaction with numerous experts from different parts of country. The training programme was very comprehensive and began with very basics of computer vision and pattern recognition and took participants at advanced level to bring them in a position to use these techniques in their area of research. Eminent speakers and experts from IIT's and renowned institutes glorified the STTP. The inaugural function of the STTP was held at 10.00 AM on July 13<sup>th</sup>, 2016. The inauguration accomplished in the presence of Chief guest Dr. Balasubramanian R, Dr. Partha Pratim Roy as Guests of honor, Dr. L. M. Waghmare Director of the Institute, Dr. M. B. Kokare, CoE coordinator, and Dr. S. N. Talbar & Dr. A. B. Gonde Course coordinator. The inauguration was anchored by Mr. Suhas Sapate. The daily plan of the STTP (one and half hour each) four sessions including hands on practical sessions in a day was scheduled in prior, and was executed accordingly.

**Participants:** 86 Participants in total, 4 from different academic institutes and 82 from our institute including Faculty members, Research Scholars and M.Tech students actively attended the STTP.

### **Facilitators:**

- Dr. BalaSubramanian Raman, Professor, IIT Roorkee.
- Dr. Abhishek Mahajan, Dept. of Radiodiagnosis, Tata Memorial Hospital, Mumbai.
- Dr. Partha Pratim Roy, Professor, IIT Roorkee.
- Dr. P. S. Sastry, Professor, Dept. of Electrical Engg., IISc. Bangalore.
- Dr. Sumantra DuttaRoy, Professor, Dept. of Electrical Engg., IIT, Delhi.
- Dr. Sanjeev Malik, Professor, IIT, Roorkee.
- Dr. Vineeth, Asstt. Prof. IIIT, Hyderabad.
- Dr. Ghosh, TCS Innovation Center, Bangalore.
- Mr. Santosh Kute, Nashik.
- Mr. Amit Dhanwade, Pune.
- Dr. SN Talbar, Professor, Dept. of ENTC, SGGS IE&T Nanded
- Dr. U. V. Kulkarni, Professor, Dept. of Computer Engg., SGGS IE&T Nanded.
- Dr. A. V. Nandedkar, Associate Prof. Dept. of ENTC, SGGS IE&T Nanded.

**Coordinators:** Dr. S. N. Tabar and Dr. A. B. Gonde

## Activity 16: International Conference on Signal & Image Processing “IConSIP – 2016”, 6<sup>th</sup> – 8<sup>th</sup> October, 2016

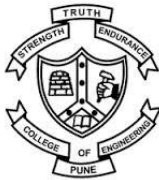
The First International Conference on Signal and Information Processing (IConSIP) was organized during 6<sup>th</sup> to 8<sup>th</sup> October, 2016. IConSIP was organized by Shri Guru Gobind Singhji Institute of Engineering and Technology Nanded in association with Indian Institute of Technology Bombay, College of Engineering Pune, Sri Venkateshwara University College of Engineering, Tirupati and technically co-sponsored by IEEE Bombay section.



SGGSIE&T, Nanded



IIT, Bombay



COE, Pune



SVUCOE, Tirupati



IEEE, Bombay section

The aim of the conference was to provide a platform for researchers across the globe to exchange their innovative ideas, enrich knowledge domain and expand their network of research community. IConSIP-2016 invited leading scientists, engineers, practicing experts from a wide range of disciplines associated with recent advancements in signal, image and information processing and its applications. This conference invited speakers for the plenary talks related to the signal and information processing.

The emeritus researchers were,



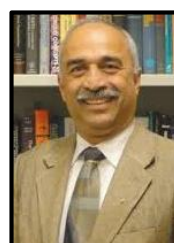
Prof. B. S. Manjunath,  
University  
California, Santa  
Barbara, USA



Prof. Subra Ganeshan,  
Oakland University  
Rochester,  
Michigan, USA



Prof. A. F. M. Hani,  
University  
Technology  
Petronas, Malaysia



Prof. Rangaraj  
Rangayyan,  
University of  
Calgary, Canada



Prof. Peter  
MacFarlane,  
University of  
Glasgow, UK

Despite of the Plenary Talks by experts, in order to provide hands on experience to the researchers IConSIP 2016 has also organized the Pre-conference tutorial sessions by



Dr. Bruno Lay,  
CEO, ADCIS, France



Dr. Fawnizu, Assoc.  
Professor, University  
Technology Petronas,  
Malaysia

**Preconference Tutorials:**

**Dr. Bruno Lay**

**Topic:** Mathematical Morphology and New Trends in Image Processing



**Dr. Fawnizu**

**Topic:** Performance Enhancement of Electronic Circuit



## DAY 1

### 09.00 - 10.00 am: Inaugural Function

IConIP first day started with the grand inauguration in the presence of Hon' dignitaries from various fields. This inauguration was carried out in the auspicious presence of,

Dr. P. Vidyasagar, Vice Chancellor, SRTM University, Nanded

Mr. Jabinda, BoG Member, SGGSI&T, Nanded

Mr. Milind Pohnerkar, BoG Member, SGGSI&T, Nanded

Mr. Chandrakant Ghavane, Ex - BoG Member, SGGSI&T, Nanded

Dr. B. M. Naik, Former Principal, SGGSI&T, Nanded

Prof. Peter MacFarlane, Professor, University of Glasgow, UK

Prof. Vikram Gadre, Professor, IIT, Bombay

Prof. B. S. Manjunath, Professor, University of California, Santa Barbara, USA

Prof. Subra Ganeshan, Professor, Oakland University Rochester, Michigan, USA

Prof. K. Narasimhan, IIT, Bombay

Dr. P. P. Rege, Professor, College of Engg. Pune

Dr. B. M. Dabade, Professor, SGGSI&T, Nanded

Dr. L. M. Waghmare, Director, SGGSI&T, Nanded

Dr. V. M. Nandedkar, Professor, SGGSI&T, Nanded

Dr. M. B. Kokare, Coordinator, CoE (S&IP), SGGSI&T, Nanded

Inauguration started with the Saraswati Pujan and Lamp Lightning ceremony by all the dignitaries on dais. Followed by the felicitation of all the Hon' dignitaries. Dr. Manesh Kokare briefed about the conference and welcomed all the participants. A short video regarding the journey of the Centre of Excellence in Signal & Image Processing was presented by the research scholars. This was followed by the unveiling of the proceedings of IConSIP 2016 by the Hon' dignitaries present on the dais. Dr. P. Vidyasagar, announced the inauguration of conference and congratulated the organizers. Mr. Jabinda congratulated the organizers and encouraged participants to have a fruitful conference. Mr. Milind Pohnerkar, also congratulated the organizers. Mr. Chandrakant Ghavane encouraged participants to apply their research into entrepreneur direction for the overall up-liftment of the society. Dr. L. M. Waghmare announced the inauguration of conference and encouraged participants to have a knowledgeable and fruitful stay at institute. This was followed by the expressing vote of Thanks to all the Hon' dignitaries and participants.







### 10.00 – 11.00 am: Keynote 1 by Prof. B. S. Manjunath

Inauguration was followed by the first keynote talk by Prof. B. S. Manjunath, Professor, University of California, Santa Barbara, USA on topic “Scalable Image Information in the cloud”. Session chaired by Prof. Peter MacFarlane.

### 11.30 am – 12.50 pm: Oral Presentations Session - 1



Three parallel presentation sessions were commenced at different presentation venues based on the three different track themes. Track 1 – Biometrics, Track 2 – Image Processing, Track 3 – Wireless Sensor Networks. All the sessions were chaired by different session chairs for the comments and evaluation of the presentations by participants.

Track	Theme	Session Chairs
Track 1	Biometrics	Prof. V. M. Gadre, IIT, Bombay Prof. S. P. Mahajan, COE, Pune
Track 2	Image Processing	Dr. Bruno Lay, CEO, ADCIS, France Dr. S. N. Talbar, Professor, SGGSIE&T, Nanded
Track 3	Wireless Sensor Networks	Dr. Fawnizu, UTP, Malaysia Dr. A. M. Deshpande



**02.00 – 03.00 pm: Keynote 2 by Prof. Subra Ganeshan**

Second Keynote was delivered by Prof. Subra Ganeshan, Professor, Oakland University Rochester, Michigan, USA on “Challenges in Advanced assistant system”.





### 03.20 – 05.00 pm: Oral Presentations Session - 2

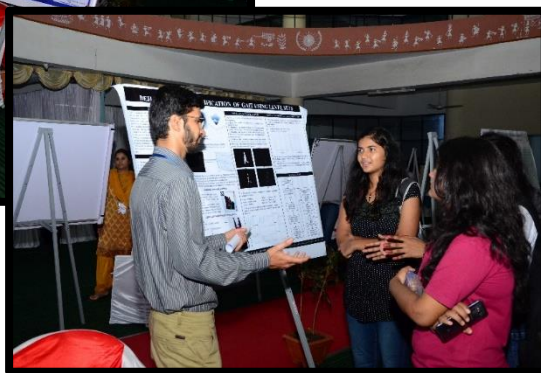
Next oral presentation sessions were commenced after the second keynote talk at different presentation venues based on the three different track themes. Track 1 – Image Processing, Track 2 – Signal Processing, Track 3 – Very Large Scale Integration. All the sessions were chaired by different session chairs for the comments and evaluation of the presentations by participants.



Track	Theme	Session Chairs
Track 1	Image Processing	Prof. Rangaraj Rangayyan, University of Calgary Dr. A. B. Gonde, SGGSIE&T, Nanded
Track 2	Signal Processing	Dr. P. P. Rege, COE, Pune Prof. S. V. Bonde, SGGSIE&T, Nanded
Track 3	Very Large Scale Integration	Dr. S. K. Vipparthi, MNIT, Jaipur Dr. S. S. Gajre, SGGSIE&T, Nanded

### 05.00 – 06.30 pm: Poster Presentations

Oral presentations were followed by the poster presentations by participants. Session was chaired by Dr. Vibha Vyas, College of Engg. Pune and Prof. R. R. Manthalkar, SGGSIE&T, Nanded.



06.30 – 08.00 pm: Cultural Program





## DAY 2

### 09.00 – 10.00 am: Keynote 3 by Prof. Peter MacFarlane

Day 2 commenced by the third keynote talk by Prof. Peter MacFarlane, Professor, University of Glasgow, UK on topic “Electrocardiography: Past, Present and Future”.



### 10.30 am – 12.10 pm: Oral Presentations Session - 3

Three parallel presentation sessions were commenced at different presentation venues based on the three different track themes. Track 1 – Signal Processing, Track 2 – Content based Image Retrieval, Track 3 – Medical Image Processing. All the sessions were chaired by different session chairs for the comments and evaluation of the presentations by participants.

Track	Theme	Session Chairs
Track 1	Signal Processing	Dr. Tapankumar Gandhi, IIT, Delhi Prof. Y. V. Joshi, SGGsIE&T, Nanded
Track 2	Content based Image Retrieval	Dr. S. Murala, IIT, Ropar Prof. R. S. Holambe, SGGsIE&T, Nanded
Track 3	Medical Image Processing	Dr. M. Kolekar, IIT, Patna Dr. Minakshi Thakur, Tata Memorial Hospital, Mumbai



### 12.10 – 12.50 pm: Project Exhibition

Project Exhibition was scheduled during time slot. Different projects were been exhibited by the research scholars of centre of excellence in signal and image processing, Students from Visveswaraya National Institute of Technology, Nagpur.



### 02.00 – 03.00 pm: Keynote 4 by Prof. A. F. M. Hani

Fourth Keynote was delivered by Prof. A. F. M. Hani, Professor, University Technology Petronas, Malaysia on “RETINO – A computerized diabetic retinopathy grading and monitoring system”. Session chaired by Prof. V. M. Gadre.







**3.20 – 5.00 pm: Oral Presentations Session - 4**

Next oral presentation sessions were commenced after the fourth keynote talk at different presentation venues based on the three different track themes. Track 1 – Image Processing, Track 2 – Machine Learning, Track 3 – Image Processing. All the sessions were chaired by different session chairs for the comments and evaluation of the presentations by participants.

Track	Theme	Session Chairs
Track 1	Image Processing	Dr. K. M. Bhurchandi, VNIT, Nagpur Dr. P. P. Bartakke, COE, Pune
Track 2	Machine Learning	Dr. Dileep Kumar, University Technology Petronas, Malaysia Dr. A. V. Nandedkar, SGSIE&T, Nanded
Track 3	Image Processing	Dr. R. P. Maheshwari, IIT, Roorkee Dr. R. N. Awale, VJTI, Mumbai

**06.30 – 08.30 pm: Visit to Huzur Sahib Sachkand Gurudwara**



All the participants were taken on a visit to Huzur Sahib Sachkand Gurudwara, one of the most sacred places of the Sikhs across India. This visit was purposed to explore the local attractions in the conference hosting city.

**08.30 – 10.00 pm: Banquet Dinner**

In order to give a memorable night to all the participants of the conference and the delegates were invited for the grand banquet dinner organized at Hotel City Pride, Nanded.





## DAY 3

### 09.00 – 10.00 am: Keynote 5 by Prof. Rangaraj Rangayyan

Day 3 commenced by fifth keynote talk by Prof. Rangaraj Rangayyan, University of Calgary, Alberta, Canada on topic “Detection of Architectural Distortion in prior mammograms subtle signs of breast cancer”. Session chaired by Prof. A. F. M. Hani



### 10.30 am – 12.10 pm: Oral Presentations Session - 5

Two parallel presentation sessions were commenced at different presentation venues based on the two different track themes. Track 1 – Image Processing, Track 2 – Medical Image Processing. All the sessions were chaired by different session chairs for the comments and evaluation of the presentations by participants.

Track	Theme	Session Chairs
Track 1	Image Processing	Dr. Dileep Kumar, UTP, Malaysia Prof. S. V. Bonde, SGGSIE&T, Nanded
Track 2	Medical Image Processing	Dr. Abhishek Mahajan, Tata Memorial Hospital, Mumbai Prof. S. T. Hamde, SGGSIE&T, Nanded





### 01.30 – 02.30 pm: Panel Discussion

Towards the end of the conference Panel discussion was carried out in the presence of various decision makers and participants. This panel discussion was chaired by Prof. V. M. Gadre and topic of discussion was the “Research Future directions and steps towards the entrepreneurial research”. Panel Discussion was graced by,

Prof. V. M. Gadre, Professor, IIT, Bombay

Mr. Sunil Raithatha, Chairman, Vinodrai Engineers Pvt. Ltd., Jalna

Dr. L. M. Waghmare, Director, SGGSI&T, Nanded

Prof. A. F. M. Hani, Professor, University Technology Petronas, Malaysia

Prof. Rangaraj Rangayyan, Professor, University of Calgary, Alberta, Canada

Dr. Tapankumar Gandhi, Assoc. Prof. IIT, Delhi

Dr. Maheshkumar Kolekar, Assoc. Prof. IIT, Patna

Dr. Minakshi Thakur, Radiologist, Tata Memorial Hospital, Mumbai

Dr. Abhishek Mahajan, Radiologist, Tata Memorial Hospital, Mumbai

Dr. Dileep Kumar, Research Manager, CISIR, University Technology Petronas, Malaysia



### 02.30 – 03.30 pm: Valedictory Function

At the end International Conference of Signal and Information Processing was concluded with the grand valedictory ceremony. In order to encourage participants various awards were distributed such as, Travel Bursary Award and Best Paper Award.



Travel Bursary Award was given to 15 participants whereas Three Best Papers were selected for the Best paper award.

### Travel Bursary Awards:



Sr. No.	Paper ID	Name of Author & Affiliation
1	67	Jigneshkumar Prajapati, SVPESFET&R, Surat, India
2	145	C M Vikas, IISc, Bangalore, India
3	206	Ila Sharma, PDPM IIIT, Jabalpur, India
4	212	Niyan Marchon, Goa University, India
5	266	Raviraj Shelke, College of Engg. Pune, India
6	270	Thiyam Churjit Meetei, Assam University, India
7	287	Tanmay Bhowmik, IIT, Kharagpur, India
8	303	Shipra Suman, UTP, Malaysia
9	316	Akash Gandhamal, SGGSI&T, Nanded, India / UTP, Malaysia
10	319	Gitesh Agarwal, IIT Ropar, India
11	320	Nikhil Agrawal, PDPM IIIT, Jabalpur, India
12	336	Ram Kanhe, MIT, Aurangabad, India
13	354	Parmeshwar Birajadar, IIT, Bombay, India
14	380	Shreyank N Gowda, RVCOE, Bangalore, India
15	455	Jagadeeswara Rao Annam, University of Hyderabad, India



**Best Paper Awards:**

Rank	Paper ID	Name of Author & Affiliation
1	67	Jigneshkumar Prajapati, SVPESFET&R, Surat, India
2	316	Akash Gandhamal, SGGSI&T, Nanded, India / UTP, Malaysia
3	354	Parmeshwar Birajadar, IIT, Bombay, India



**Conference Convener: Dr. Manesh Kokare**

## **Activity 17: Two Day's Workshop on "Proteus Simulation", 28<sup>th</sup> -29<sup>th</sup> January 2017**

The Proteus Design Suite is an Electronic Design Automation (EDA) tool including schematic capture, simulation and PCB Layout modules. Proteus Design Suite is widely used for Microcontroller Simulation like PIC, ATMEL (AVR and Arduino), 8051, ARM-Cortex-M3, NXP 8051, ARM7, Texas Instruments MSP430, PICCOLO etc. and PCB design. If you have expertise on Proteus Design Suite it will easy to verify results in simulation. Program Outline: This two day workshop aimed at enhancing knowledge and hands on Proteus Design Suite for ARM7 LPC2148 Microcontroller.

**Participants:** M. Tech Electronics Students, 10 Third Year and faculty members.

The contents of this workshop included:

1. Introduction of Proteus and Advantages of using Proteus
2. Basic Command and Component Selection in Proteus
3. Proteus Design for different small projects like LED blinking, Switch, Stepper Motor etc.
4. Proteus Design for different Peripherals like ADC, DAC, LCD, Timer etc.,
5. Proteus Design for PCB Layout and Schematic Placement of Different Components

The workshop commenced with felicitation of speaker Mr. Tushar Jankar. Speaker has started his session with introduction and advantage of Proteus for microcontroller simulation. After that speaker has cover hands on session on Proteus and Basic component selection and different projects simulation.

**Co-ordinator:** Prof. S. N. Talbar

## **Activity 18: Two Day's Workshop on "Embedded Linux", 11<sup>th</sup> -12<sup>th</sup> February 2017**

Linux is a Unix-like computer operating system assembled under the model of free and open-source software development and distribution. Linux was originally developed for personal computers based on the Intel x86 architecture. Because of the dominance of Android on smartphones, Linux has the largest installed base of all general-purpose operating systems. Linux is also the leading operating system on servers and other big iron systems such as mainframe computers, and is used on 99.6% of the TOP500 supercomputers. Operating systems based on the Linux kernel are widely used in embedded systems such as consumer electronics. Embedded systems programming in Linux is a challenging field and if you have some programming experience with Embedded C, it becomes easier.

### **Program Outline:**

This two day workshop aimed at enhancing programming skill required for Embedded Linux System. The contents of this workshop included:

1. Introduction to Linux and development of Linux over the years
2. Linux Kernel Introduction and compilation of Kernel
3. Writing ARM Cortex GPIO Programming
4. Writing a program for Linux Boot Process and GRUB Utility
5. Writing C program for Linux Device drivers
6. Introduction to IOT: hardware/software
7. Writing RasberyPi GPIO Programming

The workshop commenced with felicitation of Dr. Ameet Patil, Tech. Entrepreneur, Ecobillz, Mr. Sushant Dhamanekar and Mr. Swapnil Bandiwadekar, Software Engineering at Ecobillz, Dr. Ameet Patil started with basics of Linux open source operating system. Introduction of basic Linux and development of Linux Operating and current trends in Linux operating system. After that basic of Linux Kernel, Structure of Linux Kernel. After that Session were divided two parts Electronics students have hand on basic Linux commands and hands on Kernel Development. Next Session booting process for Linux have been explain with GRUB handling utility. While in Parallel to this Mr. Sushant Dhamanekar for VLSI students hands on session on ARM programming for GPIO and temperature sensor interfacing with IOT is taken. On Second day hands on session for device driver and introduction to IOT is taken by Dr. Ameet Patil. For Electronics Student hands on session on Raspberry Pi is taken while VLSI and Embedded Student Kernel Compilation and GRUB utility is conducted Swapnil Bandiwadekar.

**Outcomes:** The M. Tech students and faculty members have learned basics of Linux, coding with C and Compilation of Linux Kernel IOT interfacing, ARM cortex GPIO programming and Raspberry Pi programming.

**Co-ordinator:** Prof. S. N. Talbar



## **Activity 19: One Week Short Term Training Program on “Statistical Analysis for Signal and Image Processing and Data Analysis”, 27<sup>th</sup> – 4<sup>th</sup> March 2017**

The speaker for the STTP was Prof. Vivek Vijay who is currently an assistant professor in Mathematics Department at IIT Jodhpur. He completed his B.Sc (Physics, Chemistry, and Mathematics) and M.Sc (Mathematics) from Govt. College Kota (Presently Kota University), and Ph.D (Statistics) from IIT Bombay. He was rewarded Gold Medal by Govt. College Kota for securing highest marks in M.Sc., 1999; Junior and Senior Research Fellowship by CSIR for graduate studies at IIT Bombay during 2001-2006 and Best Faculty Award, IIT Jodhpur, 2014.

**Objective:** The purpose of conducting the workshop was to motivate all the students as well as faculty for their mathematical excellence. Mathematics is the root of all engineering discipline. Anyone can do great research with his/her mathematical base.

**Program Outline:** On the very 1st day (27/02/17), Prof. Vivek taught basics of Probability theory which includes relative frequency distribution, conditional probability, law of total probability, Baye’s theorem, and independence of events. He also explained the relation between set theory and Probability theory. Consequently, sir solved so many problems from assignment. On 2nd day, sir continued the rest part of Probability theory such as random variable, binomial distribution, features of Probability distribution, Poisson’s distribution, geometric distribution, continuous random variable, cumulative distribution function, uniform distribution, gamma distribution, exponential distribution and normalization. He also defined some properties of different distributions. Sir used nice practical and perfect examples to explain Probability theory. On 3rd day, the topic covered by him was Data analysis (modeling). He taught that error can be minimized by applying Conditional Probability Density Function which included conditional variance and covariance matrix and its properties. Last of this season, related assignment was solved. On 4th day, sir explained Principle Component Analysis (PCA) step by step and told how data reduction is possible using of PCA. In next season, sir covered preliminary of Statistics including t-distribution, F-distribution, chi square distribution. Consecutively, bivariate normal and multivariate normal distributions were covered as per availability of time. On 5th day, sir gave an idea of Random process which is having Markov chain and its properties. He also told that random process is solved by conditional and joint probability and continued an analysis of homogeneous Markov chain followed by some nice examples and problems. On last day, project works were presented by some group of students. Those mini projects were assigned by Vivek sir into few groups during first five days.

**Outcome:** The way of teaching by Vivek sir was very nice. He always used practical examples to relate Probability and Statistics theory. So that, it made simpler to understand. His interactive nature with students made those lectures memorable. Most important thing is that sir didn’t use any book or any presentation during his lectures. The students learnt difficult areas of mathematics in easiest ways.

**Coordinator:** Dr. A. R. Patil

## Activity 20: Industrial and R&D activities of Pragyaa, 3<sup>rd</sup> - 5<sup>th</sup> March 2017

### Objective:-

PRAGYAA, a national level technical fiesta of SGGSI&T, Nanded organized every year to provide a platform for students to show their excellence in techno-social competitions. Each year we have a constructive theme working for the welfare of society & technology. Students come in huge numbers to participate in the multitude of events ranging from the engineering project exhibitions, technical and non-technical competition to the bewildering robotics and get a chance to delve into a variety of exhibits. We also have brainstorming junior scientist for nurturing 500+ future engineers. We aim at focusing on excellence of technology for human welfare and add a new dimension to success of our extravaganza every year so that it will reach the height of its glory. PRAGYAA 2017 has techno-socio theme “AAGNEYA” and tagline “Igniting future Entrepreneurs”. The theme was chosen with the objective for the development and ignite an entrepreneur in student since there is severe growth of opportunists for entrepreneurs and nation needs that. PRAGYAA provides following opportunity to students:-

- Opportunity to present research work for Research Scholars.
- Opportunity to present innovative projects for Students.
- Opportunity to compete with 3500+ students.
- Opportunity to invoke management skills for the organizers.



The following guest were present as the model of inspiration for the participants:-

- 1) Mr. Shrikant Joshi – Ex MLC
- 2) Mr. Milind Mahajan – Scientist ISRO, Ahemdabad
- 3) Mr. Lalit Bansod – Successful Entrepreneurship
- 4) Mr. Sunil Raithata – Chairman SGGSIE&T
- 5) Mr. Milind Pohekar – BOM
- 6) Mr. Trilok Singh Jabinda – BOM

**Outcome:-**

PRAGYAA 2017 was successfully organized on 3rd, 4th and 5th March 2017 with more than 6000 footfalls participated in 50 events. Prize money of worth INR 7,00,000 was distributed among winners. Expert lecture were given by the following guest:-

- 1) Mr. Milind Mahajan on Satellite Technology.
- 2) Mr. Lalit Bansod on Entrepreneurship.
- 3) Mr. Shrikant Joshi on Need of todays Youth.
- 4) Mr. Kaustubh Gadgil on HOW TO GET INTI BARC.
- 5) Mr. Digvijay Wadekar on Career Guidance.







## **Activity 21: Six Day's Workshop on "Personality Development and preparing subjects for data collection", 7<sup>th</sup> -12<sup>th</sup> March 2017**

### **Background:**

The Art of Living is the largest NGO conducting Youth Empowerment Seminar (YES+) for young participant age 18 to 30 years. The YES+ is the package of yoga, pranayama, meditation and techniques to develop personality of participants. The EEG is acquired before the course and after 10 weeks of course from the participants. The participants would perform the daily practise of yoga, pranayama and meditation during 10 weeks.

### **Objectives:**

- To develop personality of students through art of living Yoga protocol
- To record EEG data for Yoga and Meditation research

**Participants:** Research Scholars, UG, PG Students.

Format of workshop:

Day 1: Understand about Seven levels of existence, four sources of Prana, learned Ujjayi breath



Day 2: Participants learned standing yoga, three stage pranayama, Bhastrika and omkar. The unique technique of AOL is Sudharshankriya performed by the all participants.



Day 3: Participants learned sleeping on stomach and back yoga



Day 4: Suryanamskar, five knowledge keys

Day 5: Participants were shared their experiences in front of Director of the institute Dr. L. M. Waghmare, Dr. R. R. Manthalkar, Dr. M. B. Kokare and Dr. R. S. Holambe. Concentration yoga and practiced all actives done in previous sessions.



Day 6: Participants did seva at Kaleshwar temple. Samarpan (Dishavandana)



**Outcome:** The participants has been studied different types of yoga for concertation and wellbeing. Data acquired of the subjects for research purpose.



**Coordinator:** Dr. Ramchandra Manthalkar

## Activity 22: Two Day's Workshop on “Machine learning and High Performance Computing”, 9<sup>th</sup> -10<sup>th</sup> March 2017

On 9<sup>th</sup> march 2017, the inauguration ceremony of the Workshop on “Machine learning and High Performance computing” was held at Shri Guru Gobind Singhji Institute of Engineering & Technology, Nanded In collaboration with TCS Academic Program Under Center of Excellence.

The occasion was honored by the gracious presence of Dr. M. B. Kokare Dean, R&D SGGSIET. Lenina Brigale Dean, Student affairs and T&P Prof. P. S. Nalwade, Head Department of CSE. The inauguration started at 10.00 AM by felicitation of Experts. At the beginning of the event Prof. P. S. Nalwade has outlined the purpose of organizing workshop on “Machine learning and High Performance Computing”. Dr. M. B. Kokare discussed about Center of Excellence (S&IP) activities and relevance of Machine learning and High



Performance Computing.

**Participants:** There were in total 150 participants including faculty members, research scholars, B.Tech students of different departments of the Institute

### Day 1: 09th March 2017.

Mr. Dipeak Savate started the session with the introduction of HPC and its Applications. He introduced different HPC projects being carried out at TCS and give information of new trends in HPC technologies and encouraged students to work in HPC.





Day 2: 10th March 2017.



Mr. Sachin Pawar (Tata Research Development and Design Centre, TCS Pune), Mr Nitin Ramrakhiyani (Tata Research Development and Design Centre, TCS Pune) and Dr. Uday Kulkarni Professor SGGSI&T, Nanded conducted the lectures.



After the workshop, interactive session organized for Ph.D Research scholars for opportunities and current trends in Tata Research Development and Design Centre.



**Co-ordinators:** Mr. G. S. Malande and Mr. S. P. Ugale

## Activity 23: Two Day's Workshop on "Advanced Mechatronics Training", 11<sup>th</sup> - 12<sup>th</sup> March, 2017

This workshop was conducted by n-Gen group, pune under the Department of Electronics and Telecommunication Engineering and sponsored by Center of Excellence (CoE) Signal and Image Processing. The main agenda of the workshop was to make students familiar with advance mechatronics field and industrial automation. This workshop was open for all the students from Electronics and Telecommunication Engineering as well as for Departments



**Facilitator:** n-Gen group is a one stop solution provider of comprehensive engineering solutions. since our inception in january 2007, we serviced the automobile, machine tool, cnc, packaging, medical, material handling, fluid power and other industries with n-gen applications, components, system installation and after sales service. n-Gen automation -is an ISO 9001:2008 certified group company. it serves as a specialty distributor of SKF for their mechatronics products. Also it is sole distributor for NASS magnet Germany, covering India and SAARC countries. n-Gen controls system - is a leading system integrator for parker Hannifin electro-mechanical product range. n-Gen training - provides latest vocational training in mechatronics to corporates and technical graduates.

### Sessions of the workshop:

Session 1: (1st Day 11th Mar 2017, From 10:00am to 1:00pm)

Sub-Session 1: This session was an introductory as well as interactive session between engineers of n-Gen group and students. Deshpande sir told students about the mechatronics field in industries.

Sub-Session 2: This was also introductory session carried by Sunil Lohar sir. Sir told students about the various elements of the Mechatronics. He also introduced various softwares to the students that are widely used in the industries.

Session 2 (1st Day 11th Mar 2017, From 1:30pm to 5:30pm)

Sub-Session 1: This was a practical session for the introduction of mechatronics components. Students operated various mechatronics kits for PLC's and electropneumatics.

Sub-Session 2: This session was carried by the Sunil sir in the EDC lab. He showed various parts of the PLC controller to the students and explained the functions of the every part. Sir told students about the HMI and SCADA systems. Students performed the basic programs and mechanisms on the PLC.

Sub-Session 3: This session was carried by Deshpande sir in the electronics lab. Sir introduced various mechanisms in hydraulics and electropneumatics in this session.

Session 1 (2nd Day 12th Mar 2017, From 10:00am to 1:00pm)

Sub-Session 1: This was first session of the next day. It was theoretical session for making students familiar with basic PLC programming, SCADA and HMI.

Sub-Session 2: This session was taken by Sunil Lohar sir. He taught students about the serial communication using PLC controller. He explained various communication modes in the PLC's.

Session 2 (2nd Day 12th Mar 2017, From 1:30pm to 5:30pm)

Sub-Session 1: It was again practical session for teaching students PLC system and PLC controlled electropneumatics. Students learned serial communication techniques by using PLC's. Sunil sir introduced all the students to the concepts and mechanisms of the hydraulics. Students performed the relay logic programs on the PLC trainer using ladder programming.

Sub-Session 2: This session was taken by Deshpande sir. Sir explained PLC programming to control hydraulic machines. Students performed various mechanisms to understand hydraulics concepts.

Sub-Session 3: This session was interactive session between the students and teachers. Students asked various questions to the teachers. This was the last practical session of the workshop.

Closing Ceremony: It was the last session of the workshop. Students solved posttest after the workshop. Certificates were distributed by the n-gen group to the students. Mr. C. C. Dakave said thanks to all the members of the n-gen group. All the students shared their experience of the workshop with the group members. There was a photo-session by the group members with the students.

**Co-ordinator:** Mr. C. C. Dakave.

## **Activity 24: Five Day's Workshop on "Introduction to Embedded Automation in Industries", 16<sup>th</sup> - 20<sup>th</sup> March 2017**

The workshop began on 16<sup>th</sup> March, 2017 in the presence of Hon. Director Dr. L. M. Waghmare, TEQIP-II Coordinator Dr. A. B. Gonde, Mr. M. V. Bhalerao, Mr. Pankaj Wakhradkar. Faculty coordinator provided the gathering with a brief report on "Introduction to Embedded Automation in Industries". Early in the morning all the participants have registered themselves for the five day workshop.

### **Facilitator:**

Mr. Atul Kumar Gupta from Robokriti, India

**Participants:** B.Tech students.

Mr. Gupta took over the charge as a resource person for this workshop. For five days the technical things related to the embedded automation in the industries were taught by the speaker. Also towards the closing of the event the participants were divided into groups and were a given a technical task to accomplish. Many good projects came out of this.

The one week sttp/workshop on Introduction to Embedded Automation in Industries was designed in such a way so as to cover the all the basics of Embedded system, Robotics, Need of automation in industries etc. Along with the theoretical aspects the workshop will be covering the practical sessions on controllers, sensors, communication, Monitoring, Actuators, 3D printer, Machine and drone etc.

### **Outcome:**

This one week workshop was focused on the basics of robotics and the B Tech students have got the guidelines to learn robotics.

**Co-ordinator:** Mr. Milind Bhalerao



## **Activity 25: Two Days Workshop on “Internet of Things & Applications” 18<sup>th</sup> & 19<sup>th</sup> March 2017**

The goal of this workshop was to create awareness IOT among the students and the different applications using python. In IoT Basics Using Raspberry Pi course helps you to understand concept and terminologies of Internet of things, where number of devices are interconnected with using internet. This workshop will explore hands-on training with different practical case scenarios using Raspberry pi kit. This course will provide you with hands on experience with various IoT Technologies and process which enable you in developing different application on your own

**Participants:** All TY students of different branches, SGGSIE&T, Nanded.

**Facilitators:** Mr. Sandeep Waikar, Mr. Parikshit Nimodya, and Mr. Pravin Barapatre, Swish Tech, Pune



**Saturday:** 9 am to 10 am breakfast. First morning session starts at 10:00 am to 1.30 pm. Lunch 1.30 pm to 2.30 pm and afternoon session starts at 2:30 pm to 6:00 pm

**Sunday:** 9 am to 10 am breakfast. First morning session starts at 10:00 am to 1.30 pm. Lunch 1.30 pm to 2.30 pm and afternoon session starts at 2:30 pm to 6:00 pm In this two days course following points are covered

### **Agenda:**

Introduction to Internet of Things, Raspberry Pi Vs Adriano, Linux Concepts, Introduction to Python programming, GPIO, Interfacing Raspberry Pi with different sensors, Interfacing Raspberry Pi with Email and Cloud APIs, Index: Introduction to Internet of Things, IoT Concept and Terminologies. Case Studies. Raspberry Pi, Raspberry Pi Vs Adriano, Raspberry Pi Board, Setup and Installation Network Configuration, Linux Basics, Introduction to Linux Commands, Linux File System, Linux Editors, Python Basics, Basic Operators, Variables Conditional Statements, Loops Functions, Pi Labs, Understand Sensors & GPIOs, Design of basic electronics circuits using Raspberry Pi GPIO interfacing, Interface DHT sensor with RaspPi, Interface Ultrasonic sensor with RaspPi, Interface Rain Sensor with RaspPi, Interface Moisture Sensor with RaspPi, Send Sensor data over email, Build sample app using Sensors and send data over cloud API, IoT Protocols: Bluetooth 4.0, HTTP, MQTT.

### **The resources required are:**

**Infrastructure:** Computer lab equipped with LAN cables and Projector.

**Hardware:** Raspberry Pi 3 model, 8 GB micro SD memory card, DHT Sensor, Rain Sensor, Ultrasonic Sensor, Moisture Sensor, Resistors, Breadboards, Connecting wires (Jumpers), USB Cable.

**Coordinator:** Dr. S. G. Kejgir

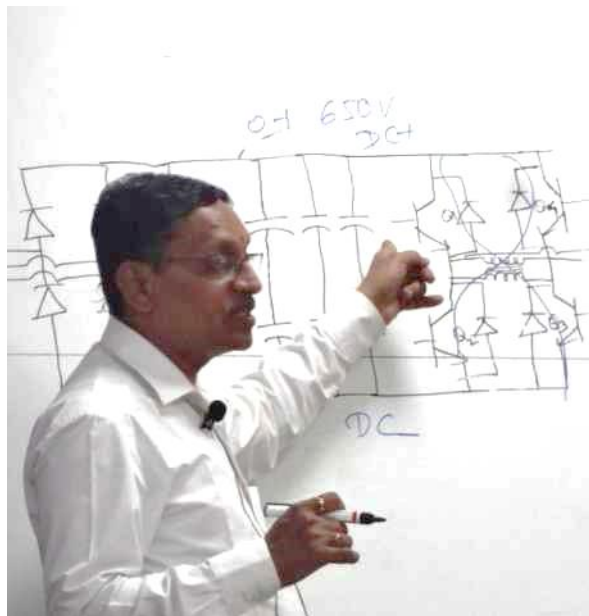
## Activity 26: One Week Short Term Training Program on “Industrial Applications of Signal and Image Processing”, 21<sup>st</sup> -24<sup>th</sup> March 2017

The 4-day short term training program on industrial applications of signal and image processing was inaugurated at the hands of Prof. L. M. Waghmare in presence of Prof. R. S. Holambe, Prof. Y. V. Joshi, Prof. M. B. Kokare, Prof. S. T. Hamde. Prof R. S. Holambe briefed about the program. Dr. R. H. Chile, Dr. B. M. Patre, Dr. R. R. Manthalkar, Dr. S. S. Gajre, Dr. V. R. Thool, Dr. V. G. Asutkar, Dr. R. V. Sarwadnya, Mr. J. G. Parkhe, Ms. S. R. Nandurkar, Mr. P. B. Ghule, Mr. T. Bhaskarwar, Mr. A. G. Tamsekar attended the inauguration function.



**Participants:** 80 participants took part in this program, out of which 59 were post graduate students, 9 Ph.D. research scholars, 6 faculty and 6 from outside S.G.G.S.I.E.&T.





**Session 1:** Design and Implementation of Digital Filters on Microcontroller and PC

Mr. Shivaji Nawatake started with taking a case study of 200KVA Pure SPWM Inverter for Up-setter machine. He formulated the problem, and explained basics of digital filter design using MSP microcontrollers. Tool for the design of filters was shown.

**Session 2:** DSP based Vac and Iac measurement in High Frequency switching application

Basics of harmonics and it's causes and prevention using digital filters was discussed. Role of filters in inverter design was given with decomposition of a square wave into multiple sine waves. Filters for the application in case study were designed by the software.

**Session 3:** DSP Pure Sine wave Inverter design and advantages against simple PWM

Code for the filter designing software was shown. Three phase rectifier and H-bridge were explained in design of Inverter. Transmission of PWM signal is efficient than I2C or SPI communication. Superimposed sine wave of higher frequency on PWM signal of 50 Hz gives a SPWM, which can be used for switching application.

**Session 4:** Importance of signal presentation

The speaker showed the application in case study in working condition in form of photos and video. Filters, capacitor banks, transformer and of signal presentation using graphics software like SLD





Day 2: Wednesday, March 22

**Session 1: Speech Processing**

Prof. T. K. Basu was welcomed by Prof. R. S. Holambe. The speaker started with discussing speech processing in medical applications of musical signal for mental illness. Further discussion consisted of speech based language translators and language recognition. Need for the inter-language translator for Indian mainstream and tribal languages was highlighted. He showed some videos on conversational voice communication through translation and communication with animals. Ex-HoD of Instrumentation Department, Prof. C. B. Deshpande attended this session.

**Session 2: Early Detection of Oral Cancer: A Computer Vision Theoretic Technique**

Prof. A. K. Ray was welcomed by Prof. Y. V. Joshi. The discussion started with types of oral cancers and occurrence of them in different parts of the world. He showed how Surface Epithelium layers are arranged and where the cancerous part is observed. Emphasis was given on OSF type of cancer which is most commonly found in India. A computational approach to detect OSF and usefulness of texture feature were discussed. The importance of Indian database and standards along with medical expert's supervision was highlighted. Ex-Principal of SGGSI&T, Prof. B. M. Naik attended this session.

**Session 3 and 4: Felicitation of Prof. A. K. Ray**

The Padma awards are conferred on the recommendation made by the Padma awards committee, which is constituted by the Prime Minister every year. Prof. A. K. Ray is conferred Padma Shri award for his contribution in Science and Engineering. He has contributed to our institute in PG courses which were introduced since 1987. President of the function was Director Prof. L. M. Waghmare, Chief guest was Ex-Principal Prof. B. M. Naik and Guest of Honor was Prof. T. K. Basu of IIT Kharagpur. Ex-HoD Instrumentation Prof. C. B. Deshpande, Ex-HoD Electronics and Telecommunication Prof. T. R. Sontakke and Prof. P. D. Jadhav were members on the dias.

The function was inaugurated at the hands of dignitaries on the dice. Prof. R. S. Holambe briefed about the Padma Shri awards and contributions of Prof. A. K. Ray to S.G.G.S.I.E.&T. Prof. Y. V. Joshi shared his memories.



Prof. C. B. Deshpande, Prof. T. R. Sontakke, Prof. P. D. Jadhav, Mr. S. Nawatake, Prof. T. K. Basu, Prof. B. M. Naik shared their memories and experiences. Prof. A. K. Ray was felicitated with the ‘Maanpatra’ by Prof. B. M. Naik. Prof. A. K. Ray shared his memories. A MoU with Maritime Research Center, Indian Maritime Foundation, Pune was signed by Prof. L. M. Waghmare and Dr. (Cdr) Arnab Das. Prof. L. M. Waghmare expressed gratitude towards Prof. T. K. Basu, Prof. B. M Naik and congratulated Prof. A. K. Ray. Prof. P. S. Nalawade offered vote of thanks.

**Day 3: Thursday, March 23**

**Session 1: Applications of DIP / DSP in Automation**

Dr. A. V. Deshmukh started with possible applications of DSP in automation industry such as vibration measurement and quality control systems. He considered the case of electronic component quality control system based on image of capacitors, which had 100ms to process the data for each component. Signal Processing and Embedded system development goes hand in hand. Session was finished with example of autonomous vehicle based on real time image processing.



**Session 2: Applications of DIP / SDP in Healthcare**

MRI, CT scan, PET were explained. Construction and working of MRI machine was explained. Conversion of 1D signal to 2D image was discussed. Radon transform was briefed when a question from audience was raised.

**Session 3: ...continued**

Cardiac MRI and z plane were discussed. The cardiac motion was shown by slicing and strips changing directions. Displacement detection was explained.

**Session 4: .continued**

1D to 2D signals and 2D to 3D signals conversion was further discussed. Day's sessions were ended with feedback and questions from audience.

## ***Day 4: Friday, March 24***

### **Session 1: Processing of Resting State MRI**

Dr. Bhushan Patil was welcomed by Prof. R. S. Holambe. Session started with brief discussion of MRI and Independent Component Analysis. Need of preprocessing steps in MRI was emphasized. Cryography functional MRI, CT, PET, slice-timing correction, motion correction, special filtering, temporal filtering, rigid, non-rigid and affine transformations were discussed topics.

### **Session 2: Medical Image Registration**

3D to 3D, 2D to 2D and 2D to 3D image conversion was discussed. Positron Emission Tomography (PET) was discussed with processing restricted dynamic range of intensity.

### **Session 3: Deep Learning, Convolutional Neural Network for Medical Image Analysis**

Basics of Deep Learning and how it is different from Multilayer network are discussed. More layers mean more precision and more data, so for processing, GPUs are used. Applications such as Speech Recognition, Computer vision, Natural Language Processing were mentioned. CNN for image segmentation case application was discussed with detail diagram of U-net.



### **Session 4: Valedictory**

Prof. L. M. Waghmare, Prof. M. B. Kokare and Prof. R. S. Holambe were the members on the dias. Participants expressed their reactions and feedback. Certificates of the program were distributed to participants. The program was concluded.

**Co-ordinator:** Prof. R. S. Holambe



## **Activity 27: Three Day's Workshop on “Distance Relaying and Application of Signal Processing in Power System Protection”, 22<sup>nd</sup> - 24<sup>th</sup> March 2017**

Three day workshop on “Power System Analysis and Signal Processing for relaying: Hands on Training on MiPower” was held during 22<sup>nd</sup> to 24<sup>th</sup> March 2017, organized by Department of Electrical Engineering in association with Power Research and Development Consultant (PRDC) Pvt. Ltd., Bangalore, India

Workshop focused on bringing out practical aspects of power system studies using MiPower simulation software. Beside, the workshop also aimed to enhance industrial and academic interaction and provide base to the students for preparation of technical interviews.

### **Facilitators:**

- Mr. Pradeepkumar Surwase, Engineer R&D-Power System Studies, PRDC Pvt. Ltd. Bangalore.
- Mr. Basil M. T., Engineer- R&D, PRDC Pvt. Ltd. Bangalore

The workshop was scheduled from 22 to 24 March, 2017. The inaugural function was held at 10:00am on March, 22, 2017.



**Coordinator:** Dr. B. M. Patre

## Activity 28: Workshop on “Unmanned Aerial Robotics”, 24<sup>th</sup> - 28<sup>th</sup> March 2017

The event was inaugurated in the presence of Hon. Director Dr. L. M. Waghmare, TEQIP-II Coordinator Dr. A. B. Gonde, Mr. M. V. Bhalerao and Mr. Pankaj Wakhradkar.

### **Facilitators:**

Mr. Atul Kumar Gupta from Robokriti India, Jabalpur.

For five days, the technical things related to the Quadcopter designing and its applications were taught by the speaker. Also towards the closing of the event the participants were divided into groups and were given all the required components to make a quadcopter. All the groups designed the quadcopters and tested its performance on institute ground. All of them had a very nice experience of successful flight and landing of the quadcopter. During this designing and testing process, students came up with many new ideas to implement and they will be guided and motivated further. The one week workshop on Unmanned Aerial Robotics was designed in such a way to cover all the basics of embedded system, robotics, need of aerial robots etc. along with the theoretical aspects the workshop will be covering the practical sessions on controllers, sensors, communication, monitoring etc.

This one week workshop was focused on the basics of robotics and the second year B.Tech students have got the guidelines to learn robotics.

Day 1: Orientation, Quadcopter basics, Uses, advantages, types, Overall structure and parts

Day 2: Frame types, CAD softwares, BLDC motors, Controlling BLDC motors, PWM, Propellers

Day 3: ESC, LiPO battery, LiPo charger, Basics of IMU, Accelerometers, Gyroscope, GPS, Reading data from sensors, Thrust of propellers.

Day 4: Flight controller, Receiver, Wireless controller

Day 5: DIY Drone flying!



**Coordinator:** Mr. Milind Bhalerao

## Activity 29: Two Day's Workshop for Enhancing Employability of PG Students "Be Different 'N' make the difference", 24<sup>th</sup> & 25<sup>th</sup> March 2017

The 2-days workshop on "Be different 'N' make the difference " short term workshop on Professional Communication was inaugurated at the hands of Director Dr. L. M. Waghmare in presence of Dr. M. B. Kokare, Dr. M. L. Waikar, Dr. Lenina Birgale, Prof. Manisha Mahindrakar. Prof. Megha JVL briefed about the program. Dr. Rajurkar Sir , Mr. Anjanchary Pinoji, Ms. Sheetal Hambarde , Mrs. Pallavi Wadhonkar, Mrs. Deepali Deshmukh attended the inauguration function.



**Participants:** 300 participants took part in this program, out of which 100 were post graduate students, 5 Ph.D. research scholars, 6 faculty.

**Facilitator:** Dr. A.Chiranjeevi





Day 1:

**Session 1:** Positive Mental attitude towards interview skills



Dr. A.Chiranjeevi started with taking a activity based learning for better understanding and knowledgeable skills i.e. Positive mental attitude is the philosophy that having an optimistic disposition in every situation in one's life attracts positive changes and increases achievement. Optimism and hope are vital to the development of PMA. For better performance. He formulated the problems, and explained basic tricks of communication as well as interview skills. The basic guidelines for the interview skill he can say. “When we LEARN we can EARN” understanding and careful listening is very important.

**Session 2:** Team Building



**Overview:** (Activity for Team Building)

This is an excellent quick, fun simple activity that shows the value of team work, it will get everybody energized and moving around the room and excited about the training, It can be a great opener for your team building class.

Time : 5 Minutes



Tools/Items required: Balloons (Balloon for each team member), Pins (Pin for every team member), Stopwatch

Setup:

Give each person one balloon and one pin then asks participants to blow their balloons. Once all balloons are inflated and everyone is ready say the following "You have 1 minute after I say go, after the minute is over the person who still has his/her balloon held up intact above his/her head is the winner of this game. Now Go!"

Rules for the trainer: For this activity to work, the trainer must not tell the group to actually use the pins and pinch each other's balloons. As soon as you say go. (Try to prompt them to move without actually telling everyone to start pinching each other's balloons using the pins, they will normally start doing this on their own).

Discussion: What will happen is that the group will go wild as soon as you say go , each team member will start pinching the balloons of others while trying to protect his/her balloon. The group will go crazy chasing each other around the room.

Discuss what prompted everyone and motivated them to be the winner? couldn't we all be winners in this game somehow , why did we decide on our own to use the pins and pinch the balloons of the other team? Tell the group that we could all have easily become winners in this activity if we all decided to raise our balloons in the air after I Said Go! , I did give you all pins but I did not say anything about pinching your partner's balloon. What's the point from this activity? This great activity makes a clear point that It's human nature that each one of us in the team wants to stand out and be the only winner which was very clear in what happened in this activity. The real team spirit is that everyone works together so we can be all winners and achieve our common team goals.

Day 2: Saturday, March 25

**Session 1:** Goal Setting and life management techniques.

The speaker started with discussing Goal Setting in life management applications.

You can apply for the goal framework:

### Developing Life Goals

- Think about what you want.
- Write about yourself.
- Imagine your future.
- Make your goals specific
- Think about why.

### Making a Plan for Achievement

- Rank your goals
- Do some research?
- Create sub goals.
- Create a timeline
- Plan for obstacles

### Working Toward Your Goals

- Create the right environment.
- Get to work.
- Work on your goals consistently.
- Stay motivated
- Track your progress



## Session 2: People Management Skill

“People skills” and attributes you’ll need to succeed in life.

In today’s world are very important aspects i.e. How to manage people?

- The ability to relate to others.
- Strong communication skills.
- Patience with others.
- The ability to trust others.
- Knowing how and when to show empathy.
- Active listening skills.

### Valedictory:

Sheetal Hambarde, Pallavi Wadhonkar, Anjanchary Pinoji etc. were the members on the dias. Participants expressed their reactions and feedback. The program was concluded.

**Co-ordinator:** Mrs. M. Mahindrakar

## Activity 30: One Week Training Program on “Remote Sensing Applications using Open Source Software” 24<sup>th</sup> - 28<sup>th</sup> March 2017

### Objectives:

1. To introduce open source QGIS software.
2. Use of QGIS for spatial analysis, geo-processing and georeferencing, watershed analysis, etc.

Department of Civil Engineering has organized one week training program on "GIS & Remote Sensing Application using Open Source Software" for students to encourage the them for the use of Open Source Software. QGIS is the prime open source software used for analysis of hydrological parameters similar to the ArcGIS. This training was offered by kCUBE Consultancy Services Pvt. Ltd., Chennai. This was spread over 5 days with four sessions every day. Mr Sitanshu Pattnaik and Mr. Farooque conducted the sessions. In all 35 students from UG and PG attended the training. The students from SY (Civil); TY (CWM) and MTech. (CWM) got benefitted. The day wise course content is described below. Mr. Atul Shinde, Research Scholar in the department looked after the session management and ensured smooth conduct of the training. Dr. M.P. Rajurkar, Associate Professor was the course coordinator for the training programme.



**Day 1 :** After inauguration, technical session conducted in Computer Laboratory of Civil Department at 10:30 am. It comprised of introduction to GIS, introduction to RS, introduction to open source GIS, introduction to QGIS.

**Day 2:** Map projection, symbology and labels, introduction to QGIS plugins and georeferencing was covered.

**Day 3 :** The topics covered in 3rd day training were: editing data, querying data, vector blender and core GIS plugins.

**Day 4:** Map composer, spatial analysis and georeferencing tools were completed on day 4.

**Day 5:** Training comprised of the raster analysis, introduction to GRASS and watershed analysis.



On each day the last session was reserved for exercise and review. This training has given information and awareness towards open source software and students are able to handle QGIS software and various tools including plugins. They are also able to create maps, assign coordinates and georeferencing the toposheet.

**Co-ordinator:** Dr. M.P. Rajurkar



## Activity 31: One Week International Short Term Training Program on “Computer Vision and Biomedical Imaging”, 28<sup>th</sup> – 31<sup>st</sup> March 2017

### Day 1: 28<sup>th</sup> March 2017

International STTP on Computer Vision and Biomedical Imaging was started with the registration of participants from various institutes in the state and from our home institute. STTP was conducted by the eminent personalities from various international universities such as, Universiti Teknologi PETRONAS, Malaysia and University of Otago, New Zealand.

### Participants:

56 participants took part in this program, out of which 38 were post graduate students, 10 Ph.D. research scholars, 6 undergraduate students and 2 faculty.

### Facilitators:

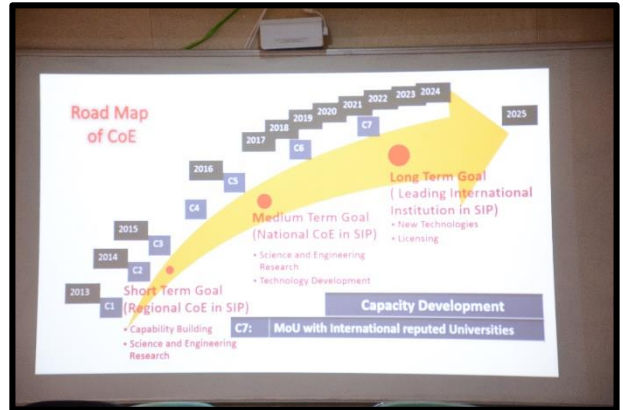
Prof. Fabrice Meriaudeau, Professor, Universiti Teknologi PETRONAS, Malaysia

Dr. Irraivan Elamvazuthi, Assoc. Professor, Universiti Teknologi PETRONAS, Malaysia

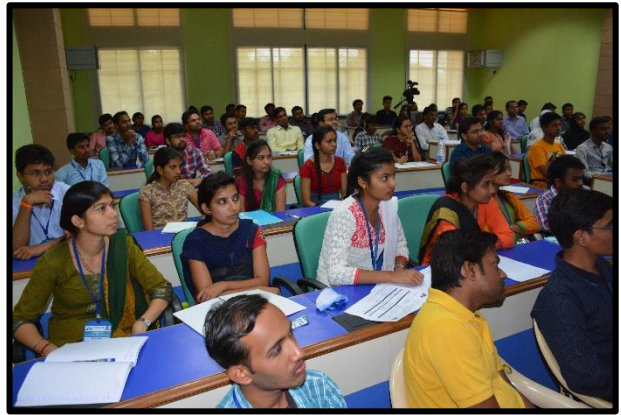
Dr. Dileep Kumar, MR Lab Coordinator, University of Otago, New Zealand



STTP was inaugurated in the presence of Prof. Fabrice, Assoc. Prof. Irraivan, Dr. R. R. Manthalkar and Dr. M. B. Kokare. STTP was inaugurated by Saraswati Pujan and Lamp Lighting by the Hon’ Members on the Dias followed by the felicitation of guests. This was followed by the brief introduction regarding the STTP and presentation of **Dr. M. B. Kokare** regarding the achievements and development of Center of Excellence (Signal and Image Processing), various research areas projects being carried out at the center.



Dr. Fabrice gave a talk on Non-Conventional imaging methods for 3D inspections,



Dr. Irraivan discussed about the **Research at UTP on Ultrasound Imaging for MSK**



**Day 2: 29<sup>th</sup> March 2017**

Day 2 started with the talk by **Dr. Fabrice** on **Infrared Imaging – (some knowledge of physics up to the applications)**



This was followed by the lectures by **Dr. Irraivan** on **“Control Systems”**



**Day 3: 30<sup>th</sup> March 2017**

Expert lecture on **“Computer Aided Diagnostics for retina Related Diseases/ Medical and Biomedical imaging applications”** by **Dr. Fabrice**





Lecture on “**Advanced Robotics**” was delivered by **Dr. Irraivan**



**Day 4: 31<sup>st</sup> March 2017**

Day 4 was engaged by **Dr. Dileep Kumar** through expert lectures on **MR Imaging: From Proton to Pixels**

**Medical Imaging: Bringing Pixels to Life Sciences**



**Coordinator:** Dr. M. B. Kokare and Dr. S. N. Talbar



## **Activity 32: “ One Day HR and Tech Meet ”, 27<sup>th</sup> March 2017**

**Venue:** Hotel Sheraton Grand, Pune Bund Garden.

This meet was attended by the 100 delegates (including HRs, Technical Persons, CEOs, SGGS BOM, Faculty and students). As an outcome seven MOUs were signed between SGGSIE&T and various companies like Aspire Talent Search, UB Cables, New Indictrans Technologies Pvt Ltd, Pune, Imasion Technologies, Tech Prime Labs Software Pvt Ltd, Sadmagay, Thought Craft Pvt Ltd, etc. Few are in Pipeline also.

### **Objectives:**

- 1) To interact and understand the need of the industry in context of present liberal global scenarios and to find the effective and meaningful ways to build, utilize the recourses and infrastructure at both ends for mutual growth and development.
- 2) To evolve redesign and restructure the educational programs and curriculum with participation of both sides so that the students are prepared to serve the industry and face the future challenges.
- 3) To explore the possibilities to under take real -life industrial problems as projects, joint research and innovation activities and trouble-shooting works, seminars and conferences with the expertise and knowledge pool available.
- 4) To use the services of huge untapped student force in doing the required and routine works of the industry (which is almost free) and in turn student will be getting industrial training / exposure to be better oriented towards industrial needs.
- 5) To obtain specialized guidance and services and to enhance technical and soft skills so as to improve the placement of students.
- 6) To motivate and encourage student to venture into start up and entrepreneurial activities with support and guidance from institute and industry.
- 7) To establish an overall win-win partnership between our institute and industries.

**Program Schedule: Following Programm Schedule was followed for the Meet.**

<b>Time</b>	<b>Activity</b>
8.30 to 10.00 am	Registration and Breakfast
10.00 to 10.40 am	Inaugural and Address by Chief Guest
10. 40 to 11.40 am	Institute Presentation
11.40 am to 11:55 pm	Tea break
11.55 pm to 1.00 pm	Panel Discussion on bridging the gap between HR and Academia. (Panellist: Ms. Vaidehi Kodape, Mr. Charudutt Mushrif, Prachee Sonchal. Rohit Bavikar. Dnvanesh Kawade. Hrishikesh Dhande)
1.00 pm to 2.00 pm	Lunch Break
2:00 pm to 3:00 pm	Panel Discussion on understanding language of Entrepreneurs and Industrialists. (Shivraj Gurpadappa Dharne, Ajeet Kalambarkar, Anand
3 .00 pm to 4:00 pm	Group-wise interaction of faculty members with industry
4:00 pm to 4:15 pm	Tea Break
4 .15 pm to 4:45 pm	Presentation by Industries — Mr. Vinay Chitale (Endress+Hauser Automation Instrumentation Private Limited- Aurangabad)/ Presentation by Mr. Atul Kherde, MD, Thought Craft Pvt Ltd, Pune/ Kanhaiya Kale, Director Indictrans Technologies Pvt Ltd, Pune,
4 .45 pm to 5.00 pm	Vote of Thanks

### Activity 33: “Diabetic Retinopathy Screening Camp”, 25<sup>th</sup> February 2017

Retinal screening program was held at "Center of Excellence (Signal & Image Processing) in association with Dr. V. M. Sahasrabudhe Department of Ophthalmology, Dr. SCGMC Nanded on 25th Feb 2016. The Program was attended by all the staff and faculty members of the Institute. More than 50 participants are registered for the Program.

The Program was conducted by an ophthalmologist Dr. Swapnil Bansod. In his presence dilation of the patients (those who needed) has been performed. He referred those patients to Dr. SCGMC Nanded, who will further needed the detail diagnosis of retina. The doctor assist all the patients under the following guidelines.

Guidelines to follow while screening:

1. Wear glasses (distance glasses in particular) or contact lenses bring them along.
2. Your eyes can feel sensitive after the eye drops - sunglasses may help.
3. Should not drive or operate machinery after your eye screening appointment as the eye drops will affect your sight for up to five hours.
4. Should eat as normal, there is no need to fast.



**Outcome:** The staff and faculty members of the institute got an opportunity to check the retina and eye related problems.

**Co-ordinator:** Ms. A. K Manjramkar

### Activity 34: Research Visit to University of Technology PETRONAS, Malaysia

MoU with Center for Intelligent Signal and Imaging Research (CISIR) of UTP Malaysia is signed for faculty and student exchange, and collaborative research work. Universiti Teknologi Petronas Malaysia invited following faculty members for the period of 1st to 8th August 2016 for collaborative research activities, participation in training, discussion on upcoming projects and future activities and discussion on grant proposals.

Following are the details of activities carried out during this visit.

Meeting with Vice Chancellor, Hon' Datuk (Ir) Dr. Abdul Rahim Haji Hashim at Board Room, Chancellor Complex of UTP. Meeting started with the welcoming and introduction of the present dignitaries. Dignitaries present were, Ir. Dr. Abdul Rahim Haji Hashim, Vice-Chancellor, UTP, Malaysia, Ir. Dr. Ahmad Fadzil Md. Hani, Dy. Vice-Chancellor, UTP, Malaysia, Dr. Naufal Bin Saad, Director MoR, CISIR, UTP, Malaysia, Prof. Fabrice M., Dr. Nidal Kamel, Dr. Sarat Chandra Dass, Dr. Ibrahima Faye, Dr. Tang, Dr. Zuki, Dr. Leela, Dr. Dileep Kumar, Dr. Kokare M. B., Dr. Talbar S. N., Dr. Holambe R. S., Dr. Doye D. D., Dr. Manthalkar R. R., Dr. Nandedkar A. V., Dr. Kejgir S. G., Dr. Lenina SVB, Hon' Vice Chancellor thanked SGGsIE&T, Nanded for the Research Collaboration and encouraged for future activities to be undertaken proactively by both the centers. Dr. Naufal introduced about UTP and the courses offered and the achievements of the institute so far. Dr. Kokare introduced about SGGsIE&T, the courses offered, institute infrastructure and achievements of the institute.



Figure 1 Meeting with Vice-Chancellor was followed by the UTP campus visit including the departments, Library, Auditorium, Research Building, Village Hostel and CISIR (Center for Intelligent Signal and Imaging Research).





Day 3 started with the presentation by Dr. Naufal regarding the introduction of CISIR and the projects being carried out. Followed by the presentation by Dr. Kokare, regarding the information of Center of Excellence in Signal and Image Processing and the projects undertaken.



Presentation by Dr. Dileep Kumar, about the overview of the collaboration between UTP and SGGSI&T, Targets achieved so far and the research activities carried out collaboratively. Progress presentation by Mr. Akash Gandhamal, Research exchange student working at UTP from SGGSI&T on project “Volumetric Assessment of Articular Cartilage in Knee Osteoarthritis using MR Imaging”.



Presentation sessions were followed by the discussions with the research supervisors of both the centers regarding the projects being carried out and the projects to be undertaken collaboratively between UTP and SGGSI&T. Projects being carried out at both the centers are broadly related to Biomedical signal and imaging research like, Knee Osteoarthritis, Diabetic Retinopathy, Biometrics, EEG signal processing, Near Infrared Imaging, functional NIR, etc. Day started with visit to different laboratories in CISIR and discussions with research scholars regarding the projects undertaken.

Discussions with the students followed by the expert talks by Dr. Holambe R. S. on “Orthogonal Transforms: from Fourier to Wavelets” and by Dr. Manthalkar R. R. on “Interpersonal Neuro Biology” for the research scholars working under CISIR.





Workshop at Heritage Hotel, Cameron Highlands on “International Project Proposals and Grant Writings”. Discussion with Research Supervisors of both the centers regarding the projects to be undertaken jointly. Discussion was also followed by the joint-proposal writing and submission of the collaborative research activities between UTP, Malaysia and SGGSI&T, Nanded.



Concluding day of the One Week workshop on “International Project Proposals and Grant Writings” by Dr. Naufal and finalizing the list of projects to be jointly undertaken between UTP and SGGSI&T along with the two way mobility of the research students and supervisors

**Outcome:**

1. Prepared five proposals jointly with UTP Malaysia for international funding.
2. Discussed collaborative research activities and student exchange with UTP Malaysia.
3. Under this collaborative activity, ten to twelve PG students will join UTP for one year for their M Tech project from July 2017.
4. Three research scholars will join for collaborative research for the period of one year from November 2016.
5. Under this collaborative activity, ten to twelve PG students will join UTP for one year for their M Tech project from July 2017.
6. Three research scholars will join for collaborative research for the period of one year from November 2016.
7. Two PG students (Mr. Rodney and Mr. Feng) from UTP will join SGGSI&T for giving training on the emotiv machine from 16th October to 27th October 2017.



# International Internship Opportunities to Research Scholars

## Internship at NOAACREST Institute, The City University of New York

16<sup>th</sup> December 2016 – 24<sup>th</sup> March 2017

### **Duration:** (3 Months)

A Memorandum of Agreement was signed between SGGS Institute of Engineering and Technology, Nanded and The City University of New York, New York (CUNY), USA for the student exchange program. The aim of this MoA was the joint research execution of the ongoing projects on both sides. The research was conducted on a project entitled “Validation and Application of satellite Soil Moisture Data for operational flood monitoring.” Research Scholar involved in this project is Mr. Aditya P Nilawar, under the supervision of Dr. M.L.Waikar (from SGGS IE&T). The supervisors assigned from CUNY were Prof. Tarendra Lakhankar.

The research was conducted during December 2016 to March 2017 (3 Months).

Mr. Aditay P Nilawar has joined CUNY as an exchange student during the above mentioned period and carried out the research.

### **Objectives:**

- Joint Research on Validation of satellite soil moisture
- To apply physically based, Soil and Water Assessment Tool (SWAT) to validate satellite soil moisture data in parts of Puerto Rico.

### **Outcomes:**

- Validation of satellite soil moisture data.
- Joint Journal Publication.

Certificate

I hereby certify that the Mr. Aditya Nilawar was research Intern at NOAA- CREST Institute, The City University of New York, during the period starting from December 16, 2016 to March 24, 2017.

Mr. Aditya worked on research project on *Validation and Application of satellite Soil Moisture Data for operational flood monitoring*. He worked on research activities including remote sensing data analysis, SWAT modeling, and writing peer-reviewed journal publication.

As we observed, Aditya was an active and very qualified person and he could perform all of assigned tasks effectively. Besides, in my opinion, he was a motivated, devoted, professional, and hard-working person. I wish him all the best in his future endeavors. Should you have any question, please do not hesitate to contact me.

Sincerely,



*Tarendra Lakhankar; PhD PE Research  
Scientist*

*NOAA-Cooperative Remote Sensing Science & Technology  
(CREST) Center*

*The City College of the City University of New York*

*ST-185, Stein man Hall, 160 Convent Ave, New York, NY 10031*

*Office: 212-650-5815, Cell: 201-218-7348*

*Email: tlakhankar@ccny.cuny.edu*

*http .//tarendra. lakhankar. com*

**Some Glimpses of Visit at CUNY:**

**Cooperative Institutions**

**The City University of New York The City College Raza Khanbilvardi.  
Ph.D., P.E. Center Director Steinman Hall (T-107)  
New York, NY 10031 Phone (212) 650-8009 Fax (212) 650-8097 khanbi 1  
vardi @ cenycu.ny.edu.**

**University of Puerto Rico at Mayaguez**

**Ramon E. Vasquez-Espinosa, Ph D School of Engineering Mayaguez, PR  
00681-9040 Phone (787) 265-3822 Fax (787) 833-1190 [rcvc@cceupnn.cdu](mailto:rcvc@cceupnn.cdu)**

**Hampton University**

**M. Patrick McCormick, Ph.D.  
23 Tyler Street  
Hampton, VA 23668  
Phone (757) 728-6867  
Fax (757) 727 5090  
[pat.mccormick@hamptonu.edu](mailto:pat.mccormick@hamptonu.edu)**

**University of Maryland at Baltimore County Rayntond M. Hoff, Ph.D. 1000  
Hilltop Circle Baltimore, MD 21250 Phone (410)455-1610 Fax (410)455-  
1291 [hoff@umbc.edu](mailto:hoff@umbc.edu)**

**Bowie State University William T. Lawrence, Ph D, IMF Crawford Science  
Bldg. Bowie, MD 20715 Phone (301) 860-U338 Fax (301) 860-3346 B  
Lawrence @ bowicstate. edu**



Aditya P Nilawar  
Research Scholar

Dr. M. L. Waikar  
Supervisor



## **One year Research Attachment Program at Universiti Teknologi PETRONAS, Malaysia**

**Duration:** April 2016 to March 2016 (12 Months)

A Memorandum of Agreement was signed between SGGS Institute of Engineering and Technology, Nanded and Universiti Teknologi PETRONAS (UTP), Malaysia for the student exchange programme through Center of Excellence in Signal and Image Processing (CoE S&IP). The aim of this MoA was the joint research execution of the ongoing projects on both sides. Through one such MoA signed (dated: 08.02.2016) the joint research was conducted on project entitled "Volumetric Assessment of Articular Cartilage in Knee Osteoarthritis using MR Imaging". Research Scholar involved in this project is Mr. Akash Gandhamal, under the supervision of Dr. S. N. Talbar and Dr. S. S. Gajre (from SGGS IE&T). The supervisors assigned from UTP were Prof. Fadzil Md. Hani and Dr. Dileep Kumar.

The joint research was conducted during April 2016 to March 2017 (12 Months) through research attachment program. Mr. Akash Gandhamal has joined UTP as a exchange student during the above mentioned period and carried out the research.

### **Objectives of Program:**

1. Joint Research on Osteoarthritis using MR Imaging
2. Exchange of MR data collected from various sources for joint research
3. Joint Publications on the project "Volumetric Assessment of Articular cartilage in Knee Osteoarthritis using MR Imaging"

### **Outcomes of the Program:**

1. Joint Journal Publications -1 (Published) + 2 (Under Review)
2. Joint Conference Publications -1 (Published) + 1 (Accepted)
3. Collected MR data through local Malaysia hospital collaborations by UTP.

## Some Glimpses of Visit at UTP



**Supervisors:** Dr. S. N. Talbar and Dr. S. S. Gajre

# Summer Internship Program

15<sup>th</sup> May -15<sup>th</sup> July 2016

Shri Guru Gobind Singhji Institute of Engineering and Technology Nanded had organized a Summer Internship Program at Center of Excellence in Signal and Image Processing. Summer Internship provided an exciting opportunity for research oriented students to work with our renowned faculty members and research scholars.

## **Selection Procedure:**

Online applications were invited from all over India from bonafide students of recognized Universities/ Institutions who were in third year of B.E. / B.Tech program or first year of M.E. / M.Tech /M.S. program or fourth year of integrated M.E./M. Tech program of the following disciplines.

- Electronics / Electronics and Telecommunication Engineering
- Instrumentation Engineering
- Computer / Computer Science Engineering
- Information Technology

Total 217 applications were received from 41 different colleges across the country. Personal and telephonic interviews of the candidates were conducted by the expert panel. 10 undergraduate and 5 post-graduate students were shortlisted for Summer Internship Program.

## **Program Details:**

1. Each selected candidate was formally associated with one of the renowned faculty member of the Institute and worked on one of the projects in a team comprising of faculties and research scholars of the institute.
2. Accommodation for outside students was provided by the Institute during internship period.
3. 10,000 stipend was paid for the complete duration.
4. A participation certificate was awarded at the end of the programme.



Valedictory program was arranged with Director Dr. L. M. Waghmare, faculty members, research scholars and interns. Interns shared their experience with Honourable Director.

**Outcome:**

15 students from various colleges had completed the summer internship program successfully. Students worked with faculty members and research scholars of the institute in various research areas. Students had exposure to various equipment available at Center of Excellence lab. This program has provided new orientation and guideline to their future research work. This Summer Internship Program will help under graduate students to finalise their final year project and post graduate students to finalize dissertation topic.

**Coordinator:** Dr. Manesh B. Kokare



## Best Practices

Video lectures of CoE members on their area of expertise are recorded and will be made available for the benefit of students, faculty members and other society members.

Summer internship was organised for UG and PG students from 15<sup>th</sup> May to 15<sup>th</sup> July 2016.

To ensure the quality of publications antiplagarism software is purchased and all the research scholars and faculty members are encouraged to make use of it.

Separate Patent Cell is established.

IEEE International Conference in thematic area is jointly organized by SGGSIET Nanded, IIT Bombay and COE Pune, SVU CoE Tirupati on 6<sup>th</sup> -8<sup>th</sup> Oct 2016 ([www.iconsip.org](http://www.iconsip.org))

<b>Dr. Manesh B. Kokare</b>	Multimedia Course	<a href="https://www.youtube.com/watch?v=1I1gOGRoQ90&amp;list=PL2InVeXVp_-e3buMo_Y2jLkO-a3O1dqq3">https://www.youtube.com/watch?v=1I1gOGRoQ90&amp;list=PL2InVeXVp_-e3buMo_Y2jLkO-a3O1dqq3</a>
<b>Dr. Y. V. Joshi</b>	Signals and Systems	<a href="https://www.youtube.com/watch?v=i1tKb-6Fa_g">https://www.youtube.com/watch?v=i1tKb-6Fa_g</a>
<b>Dr. R. S. Holambe</b>	Overview of Digital Signal Processing	<a href="https://www.youtube.com/watch?v=78m-3QM_TxE">https://www.youtube.com/watch?v=78m-3QM_TxE</a>
<b>Prof. S. Jatti</b>	Communication System	<a href="https://www.youtube.com/watch?v=xXIIRRIgLCk">https://www.youtube.com/watch?v=xXIIRRIgLCk</a>
<b>SGGS</b>	Sggs Digital Library	<a href="https://www.youtube.com/channel/UC6BIQ8svDgwPlu1dCT6OeqQ/videos?sort=dd&amp;view=0&amp;shelf_id=0">https://www.youtube.com/channel/UC6BIQ8svDgwPlu1dCT6OeqQ/videos?sort=dd&amp;view=0&amp;shelf_id=0</a>

# 10 Key Features of CoE

1. State-of-the-art CoE has been established, which is open 24 x 7 for research scholars and PG students.
2. High end Equipment's are made available for Research.
3. Separate Knowledge Resource Center (Library) is Established with:
  - All reference and handbook of thematic area.
  - Full subscription of IEEE Journal and Conference papers.
  - Full subscription of Elsevier and Science Direct papers.
4. Ultra modern **seminar hall** with **video conferencing unit**. (4 parties can interact with each other simultaneously)
5. Mechanism for **continuous evaluation** of research scholar is established.
6. **Thirty Six FDP/Workshops/Seminars** were arranged for benefit of research scholars and faculty members.
7. Took lead to bring together other CoEs having same thematic area for collaborative research work. Its classical example is – International Conference on Signal and Information Processing (**IConSIP 2016**) jointly organised by IIT Bombay, COEP Pune, and SGGIE&T Nanded.
8. MoU with International Center of Excellence in same thematic Area
  - MoU with CISIR of UTP Malaysia.
  - Student and Faculty Exchange Program
  - Mr. Akash Gandhamal (RS) is currently doing joint research at UTP Malaysia.
    - Mr. Ravi Kamble will join UTP in July 2017.
    - Three PG students will join UTP for M Tech project in July 2017.
  - Joint research and publications: Five publications.
  - Conducted four joint international workshops.
  - Submitted five joint research proposals for international funding.
9. Future **Roadmap up to 2025** is ready and progress is made according to plan. Institute has proactively supported to take CoE to greater height.
10. **Strong human resource**: Nineteen PhD Faculty members having their research in the thematic area.

# Potential Products Developed

## MAGIC CUBE

### Introduction:

Now a day's smartphone is a basic need of humans as food, shelter and clothing. Smartphones are widely used for many applications. In this paper we tried to enhance the application of smartphones in day to day life.

### Technical specification:

- 16/32/64/128 GB storage
- Chargeable
- GPS device
- Universal remote
- Laser light
- Flash light
- 3.5 audio jack
- USB male/female
- Delicate key
- Smartphone Connectivity
- Mp3 Player

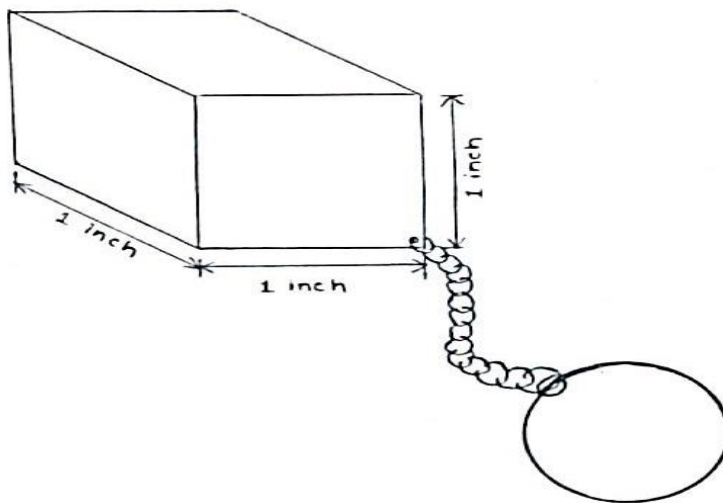
### ❖ How the product different from other?

Technology is changing drastically and in day to day life technology makes our life secured and simple. This product is UNIQUE because of it's many applications. Single device can perform many functions which are used in our day to day life as follows.

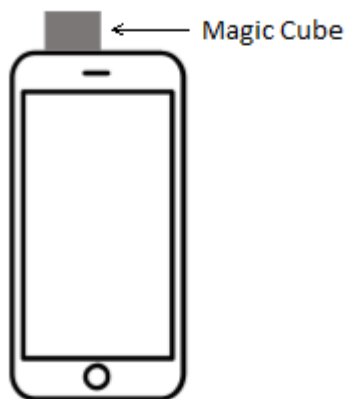
### Applications:

1. UNIVERSAL REMOTE (IRA)
2. Mobile to mobile charging / data transfer
3. Dedicated key
4. Portable battery charging
5. Flash for front camera
6. Key finder
7. Torch (chargeable)
8. Laser light (chargeable)
9. 16/32/64/128 GB storage (direct MHL connectivity)
10. OTG (Male/Female USB)
11. Selfie click
12. Connect to PC, mouse, keyboard to smart phone
13. Connect any sensor to smart phone, Biometric , ATM card scanner
14. (MP3) I-Pod (Audio jack 3.5)
15. Biomedical Application

## The Device: MAGIC CUBE



### 1. UNIVERSAL REMOTE (IRA) :



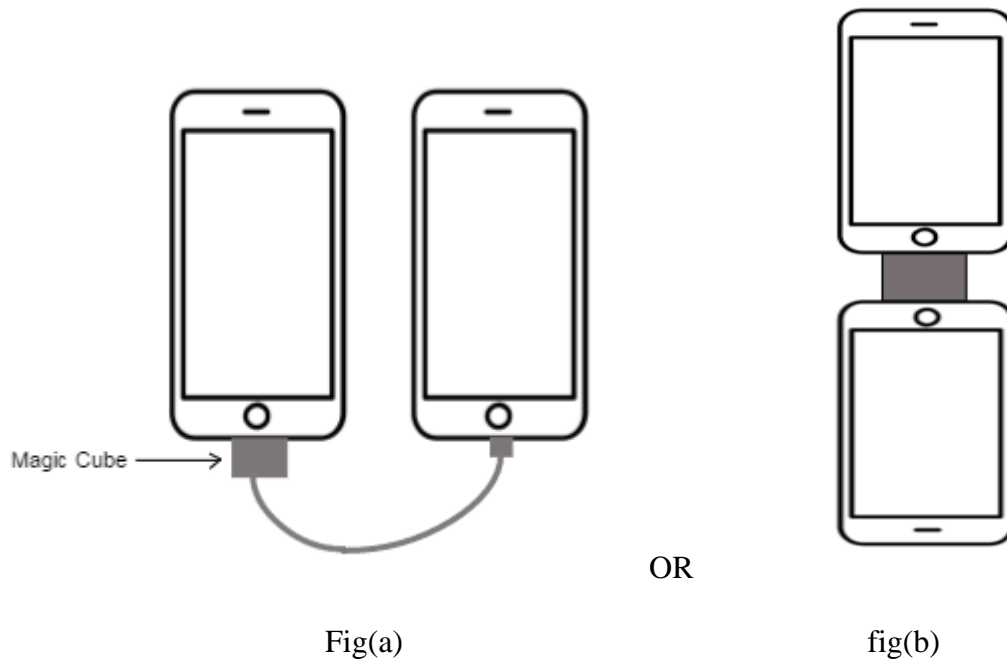
Using IRA universal remote we can control all home appliance which can control using IR (Infra-Red) remote.

Super large control Database, Which can Support Appliances over 6,000 Brand's and 250,00 codes in total have been already been stored in it's local database

- ✓ Air conditioner
- ✓ TV Set
- ✓ Set top box /satellite
- ✓ Projector
- ✓ Network box
- ✓ DVD/VCD/Blu-ray player
- ✓ Power amplifier
- ✓ Electric fan
- ✓ Switch /bulb
- ✓ SLR camera

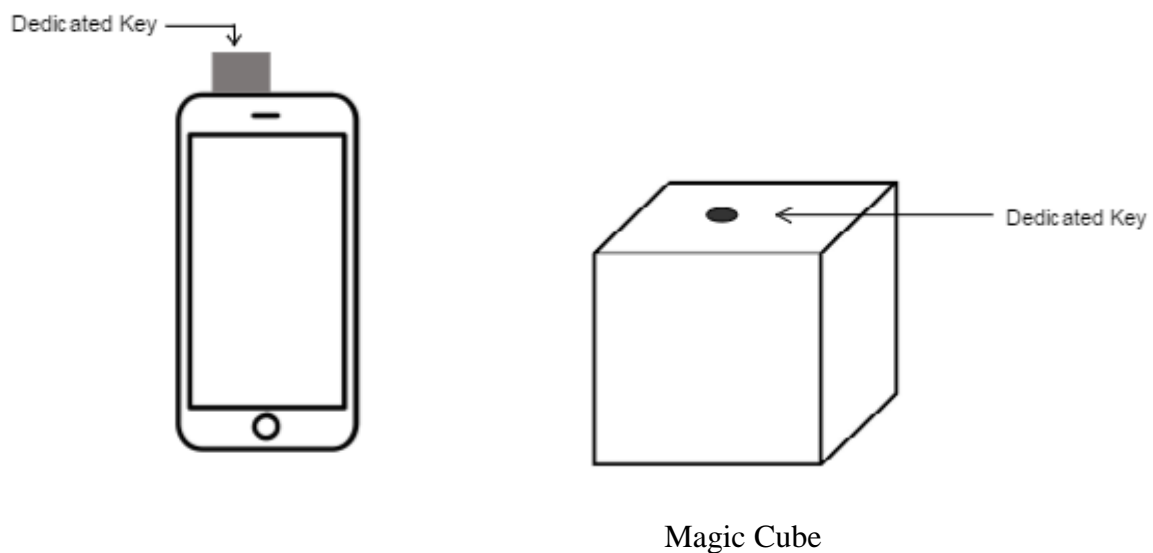


## 2. Mobile to mobile charging :



- ✓ Mobile to mobile charging is possible using MAGIC CUBE
- ✓ We can charge mobile phone connecting phone to 'MAGIC CUBE'
- ✓ Also data can be transferred from one phone to other with high rate
- ✓ Mobile with low charging charged by using the high charging smart phone

## 3. Dedicated key :



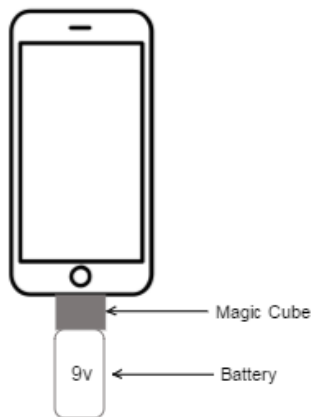
- ✓ This is magic key / dedicated key used to open application or assign operation in smart phone without unlocking your smart phone
- ✓ You can open what's app, games, or even call your loved ones

HOW IT WORKS ? : It is just like your shortcut button, you can create any function shortcut

HOW TO USE ? : Just open app and assign functions:

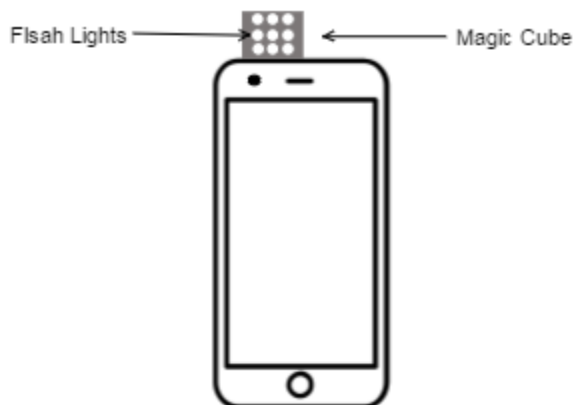
Single process - *	- What's app
Double process - **	- Call to amit
Triple process - ***	- Play song
Four process - ****	- Flash ON
Five process - *****	- Phone book
Long press -	- Camera open
Short press -	-OpenMails

#### 4. Portable battery charging :



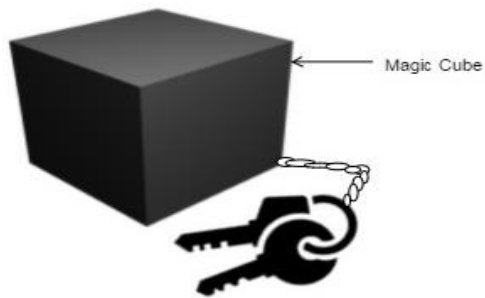
- ✓ We can charge your smartphone full by using portable battery in urgency.
- ✓ Battery is cheap
- ✓ 9v battery is of only 15 Rs

#### 5. Flash for front camera:



- ✓ Now aday'sselfies are more popular in peoples.
- ✓ We know that fact camera can take batter picture and in good light condition.
- ✓ Good light gives better quality image.
- ✓ Many smartphone don't have flash for front camera.
- ✓ So magic cube having flash for front camera to enhance yourselfieimage quality.
- ✓ Now can take selfie at night with magic cube.

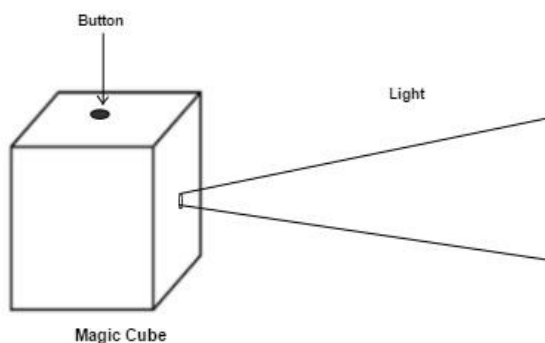
## 6. Key finder :



Amazing feature of magic cube

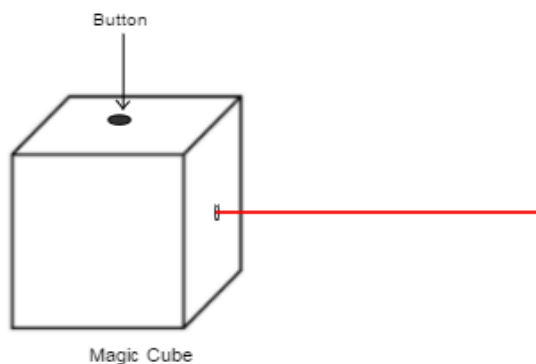
- ✓ We can track your key using magic cube.
- ✓ Now we don't need to waste time to find key while going to work.
- ✓ We can easily track our key.
- ✓ Just open app and touch button find key and magic cube alarm
- ✓ We can find our Keys, important things, bags, etc.

## 7. Touch/ chargeable torch:



- ✓ Bright touch having 9 LED
- ✓ Chargeable
- ✓ Long life span
- ✓ Range of light 100m
- ✓ Bright light

## 8. LASER light (chargeable) :



- ✓ In built laser light
- ✓ Used in presentation

## 9. USB storage Upto (16\32\64\128 GB) :

- ✓ Used as pendrive
- ✓ We can connect extra pendrive to magic cube
- ✓ Act as OTG
- ✓ Mobile charging using USB

## 10. Selfie click :

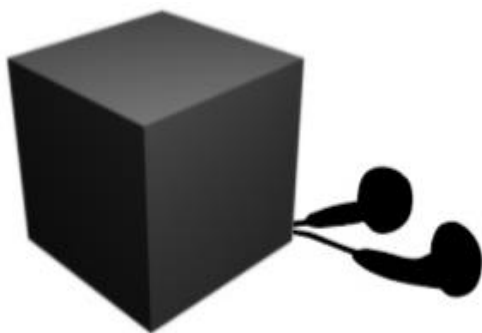
- ✓ We can capture photo using magic cube
- ✓ Selfie capture
- ✓ Magic cube connected with the smart phone using Bluetooth

## 11. Connect biometric sensor, card reader ATM :



- ✓ Connect Biometric Sensor And ATM Card Reader Using USB Connectivity
- ✓ Connect to pc, Connect mouse/ keyboard to Smartphone Make mirror imaging on Computer
- ✓ Connects biometric sensor, card reader ATM

## 12.I-PAD (mp3- player)



Magic Cube

- ✓ We can play songs in magic cube
- ✓ Connect headphone to magic cube
- ✓ Connect magic cube to computer
- ✓ Plays music in car using Aux cable

## 13. Biomedical Applications



Magic Cube



Magic Cube

- Connect Biomedical Sensor to Smartphone Using Magic Cube Such as Body Temperature Sensor, Peals Detector, Blood Pressure Measurement Device
- Connecting Biomedical Sensor to Samrtphone and Using Mobile Application



## Blind Spot Accident Avoiding Using Vehicle Detection

### Introduction :

Automatic recognition of vehicle data has been widely used in the vehicle information system and intelligent traffic system. It has acquired more attention of researchers from the last decade with the advancement of digital imaging technology and computational capacity. Automatic vehicle detection systems are keys to road traffic control and Safety nowadays some applications of these systems are traffic response system, traffic signal controller, lane departure warning system, automatic vehicle accident detection, automatic traffic density estimation and blind spot accident avoiding using vehicle detection

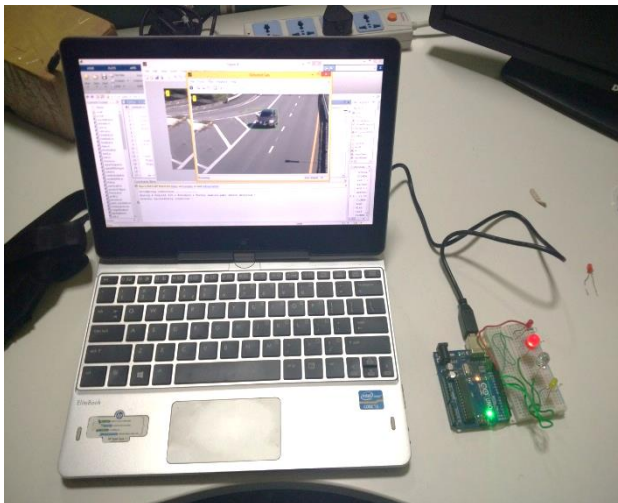
### Abstract :

This is the simple Blind Spot Accident Avoiding Using Vehicle Detection System using Computer vision. system consist of camera which capture video and processing unit which process video and gives output to the signal light so that Driver knows How many number of peoples coming from opposite side of road. each video frame processed and on the basis of foreground and background image of each video frame we detect vehicle and by counting number of detected vehicle and it shows number of vehicle coming from opposite site on signal so that driver knows how many number of vehicle coming from opposite side of road and it will helpful for avoiding accidents

### Application :

This System is Applicable at Blind Spot and U turn road for Accident Avoiding Using Vehicle Detection in Computer vision. system consist of camera which capture video and processing unit which process video and gives output to the signal light so that Driver knows How many number of peoples coming from opposite side of road. each video frame processed and on the basis of foreground and background image of each video frame we detect vehicle and by counting number of detected vehicle and it shows number of vehicle coming from opposite site on signal so that driver knows how many number of vehicle coming from opposite side of road and it will helpful for avoiding accidents

### Prototype :



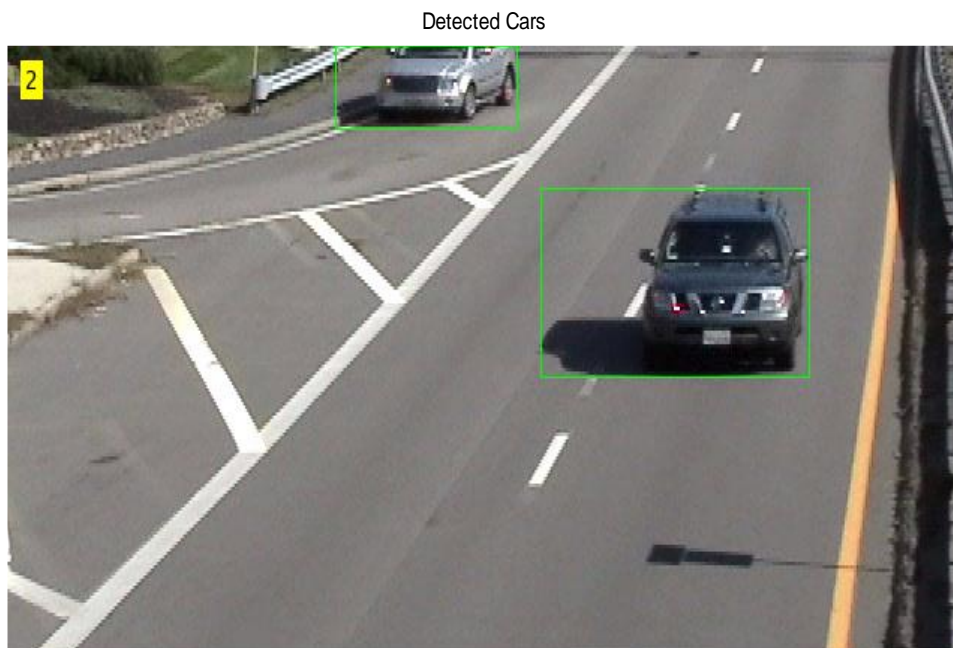
### Specifications :

- 4 GB RAM High Computational capacity of system
- Camera Capable with Day and Night working (Night Vision)
- 8 MP Camera for video recording
- Processing unit to detect Vehicle
- Hardware having 16 MHz Processor

### Advantages:

- Cheap
- Works in Day And Night (24\*7)
- Durable
- Easy to install and Working
- It can operate on Solar Energy

### Testing of System :



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## Financial Report (Upto 31<sup>st</sup> May 2017)

<b>Budget Approved</b>	<b>Interest</b>	<b>Total Amount</b>
₹ 50,000,000.00	₹ 5,013,939	₹ 55,013,939.00

### Head wise Distribution of Budget

<b>Sr No.</b>	<b>Budget Head</b>	<b>%</b>	<b>Amount Allocated</b>	<b>Expenditure Amount</b>
1	Procurement of Goods	55	₹ 30,257,666.45	₹ 29,064,220.00
2	Teaching Research Assistantship	10	₹ 5,501,393.90	₹ 6688696.00
3	Research & Development	10	₹ 5,501,393.90	₹ 8109321.00
4	Industry Institute Interaction	5	₹ 2,750,696.95	₹ 1925466.00
5	Faculty Staff Development	10	₹ 5,501,393.90	₹ 5118240.00
6	Incremental Operating Cost	10	₹ 5,501,393.90	₹ 3905303.00
<b>Total Amount:</b>			₹ 55,013,939.00	₹ 54,811,246.00
Balance Amount: ₹ 202,693.00 On 31 <sup>st</sup> May 2017				



**Thank You !!**