IConSIP

2016

IConSIP-2016

6th – 8th October, 2016

REPORT

Shri Guru Gobind Singhji
Institute of Engineering & Technology,
Vishnupuri, Nanded.

Report on

International Conference on Signal and Information Processing
IConSIP-2016

Program Chairs

Manesh Kokare
Mukul Sutaone
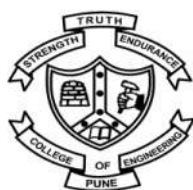S Narayana Reddy

Jointly Organized by

SGGS Institute of Engineering and Technology, Nanded

College of Engineering, Pune

Indian Institute of Technology Bombay, India

S V University College of Engineering, Tirupati

IEEE Bombay Section

Foreword

It is a great pleasure to welcome you all at the International Conference on Signal and Information Processing (IConSIP-2016), here at Nanded. This International Conference is technically sponsored by IEEE Bombay section and financially supported by Center of Excellence under Technical Education Quality Improvement Programme (TEQIP-II-CoE) of Government of India. IConSIP-2016 is jointly organized by Indian Institute of Technology Bombay, College of Engineering Pune, Shri Guru Gobind Singhji Institute of Engineering and Technology Vishnupuri Nanded and SVU College of Engineering, Tirupati, India and is proudly hosted by Center of Excellence in Signal and Image Processing at Shri Guru Gobind Singhji Institute of Engineering and Technology Vishnupuri Nanded, an autonomous institute of Government of Maharashtra state. The theme of IConSIP-2016 is "Signal and Information Processing". In the spirit of the theme, an exciting multi-track technical programme has been created from the submitted papers by the Conference Programme Committee, under the direction of General Chairs Prof. Vikram M. Gadre (IIT Bombay) and Prof. Prabir K. Biswas (IIT Kharagpur), and Program Chairs Prof. Manesh B. Kokare (SGGSIE&T, Nanded), Prof. Mukul S. Sutaone (COE, Pune), Prof S Narayan Reddy (SVU, CoE Tirupati) and Prof. Balasubramanian Raman (IIT Roorkee). We owe them an immense gratitude for their dedication, wisdom, and professionalism in putting together scientific and technical proceedings that will surely not only impact on the current research of the conference participants but will also contribute important archival material to which future generations of researchers in Signal and Information Processing will be returning for the years to come.

The technical programme is complemented by five plenary invited talk by Prof. B S Manjunath (University of California Santa Barbara, USA), Prof. Subra Ganeshan, (Oakland University Rochester, Michigan, USA), Prof. Peter W. MacFarlane, University of Glasgow, UK, Prof. A. F. M. Hani, UTP Malaysia, Prof. Rangaraj Rangayyan, University of Calgary, Alberta, Canada. Also IConSIP-2016 was well started by pre-conference one-day tutorial by Bruno Lay, CEO, ADCIS, France. We would like to thank all the invited speakers for accepting to come and help us to make this conference an even more interesting and stimulating event.

Another mammoth task in the organization of a conference is the production of the Conference Proceedings. All the material for the IConSIP-2016 proceedings content had to be assembled and checked for consistency. I would like to convey my thanks to Prof. Abhijeet V. Nandedkar and Prof. Sanjiv V. Bonde (Publication Chairs), and Excel Publications, New Delhi for the outstanding handling of this responsibility.

We are very grateful to National Project Implementation Unit (NPIU) and State Project Facilitation Unit (SPFU) for their financial support through Technical Quality Improvement Program (TEQIP-II), which helped us to enhance facilities to the conference participants. Last but not least we would like to thank the organizing committee members for their tireless effort to plan this conference meticulously and execute flawlessly, which had made this conference a grand success.

In conclusion, we wish you an intellectually stimulating IConSIP-2016 and an enjoyable stay in the historical Nanded.

L. M. Waghmare (Director, SGGSIE&T Nanded)
B. B. Ahuja (Director, College of Engineering Pune)
P. Mallikarjuna (Principal, SVU CoE Tirupati)

Welcome

Dear Participants,

As the General Chairs, it is our pleasure to welcome you all for the International Conference on Signal and Information Processing (IConSIP-2016) in Nanded, India during 6th - 8th October 2016.

This conference has drawn attendance from leading researchers and professionals from all over the world. Speakers representing industry, government policy makers, as well as academic scholars and researchers from the Signal and Information Processing areas will present and discuss the latest topics in thematic area and various modalities of Signal and Image Processing, Communication, and Networking issues, focusing on strategies, experiences and novel techniques.

This Conference is an opportunity for Signal and Information professionals to discuss state of the art developments in these fields for three days, and also provides a platform for industry leaders, academicians, and government officials to exchange ideas on technology trends and best practices.

Several renowned researchers and academicians in this field plan to attend this conference. These include:

- Prof. B. S. Manjunath, University of California Santa Barbara USA
- Prof. Subra Ganeshan, Oakland University Rochester, Michigan, USA
- Prof. Peter W. MacFarlane, University of Glasgow, UK
- Prof. A. F. M. Hani, University of Technology, PETRONAS, Malaysia
- Prof. Rangaraj Rangayyan, University of Calgary, Alberta, Canada

A full day pre-conference tutorial on various advanced topics on Signal and Image processing will be conducted by Dr. Bruno Lay, CEO, ADCIS, France. This four day technical fiesta is an excellent opportunity for all the participants to meet with researchers and professionals from all over the world, create an opportunity for networking, collaboration, sharing of technical information and the building of trust relationships internationally. As always, we extend a warm welcome to all our colleagues in the industry who share our interest in improving information processing.

We are happy that three premier institutes namely, SGGSIE&T Nanded, College of Engineering Pune, IIT Bombay and SVU CoE Tirupati) from India and came together and organized this international conference IConSIP-2016. We wish that, in future this should be a regular event, under the umbrella of the two TEQIP Centres of Excellence in Maharashtra and should acquire its own 'brand value'. We are looking forward to welcome you in Nanded, India in IConSIP-2016 at what promises to be a most stimulating and enjoyable event!

Prof. V. M. Gadre, IIT Bombay
Prof. P. K. Biswas, IIT Kharagpur
(General Chairs, IConSIP-2016)

Preface

Dear Distinguished Delegates and Guests,

It is our pleasure to welcome everybody at Nanded for the International Conference on Signal and Information Processing (IConSIP-2016), held on October 6-8, 2016. This International Conference is technically sponsored by IEEE Bombay section and financially supported by Center of Excellence under Technical Education Quality Improvement Programme (CoE-TEQIP-II) of Government of India. IConSIP- 2016 is jointly organized by Indian Institute of Technology Bombay, College of Engineering Pune, S V University College of Engineering Tirupati, and Shri Guru Gobind Singhji Institute of Engineering and Technology Vishnupuri Nanded, and is proudly hosted by Shri Guru Gobind Singhji Institute of Engineering and Technology Vishnupuri Nanded, an autonomous institute of Government of Maharashtra state, India.

The main conference themes and tracks are Signal Processing, Image Processing, Biomedical Signal and Image Processing, Machine Learning, Wireless Sensor Network, and VLSI and Embedded System Design. The conference aims to bring together researchers, scientists, engineers, and practitioners to exchange and share their experiences, new ideas, and research result about all aspects of the main conference themes and tracks and discuss the practical challenges encountered and the solutions adopted. The main goal of the conference is to provide scientific forums for exchange of new ideas in a number of fields that interact in-depth through discussions with their peers from around the world.

The conference has promise to be stimulating and interesting, thanks to the high submission rate and the hard work of the organizing committee members and of numerous reviewers. There were 491 submitted papers, implying the need for 1473 reviews! A total of 86 papers were finally accepted for oral presentation and 62 for poster presentation. This acceptance rate puts IConSIP-2016 on par with other major quality events of this type.

In this conference, a robust ranking formula and double blind review process was used for ranking the papers, combining the rankings of the three assessors in a robust way and taking into consideration the total number of papers each person ranked. In addition to the accepted papers, we also have invited five speakers, who will give authoritative review talks on the topic of their expertise. We would like to take this opportunity to thank all these contributors and express our deep gratitude to all members of the Programme Committee, Organizing Committee, and reviewers particularly to those who willingly stepped in at the last minute to replace person who, for whatever reason, had to withdraw.

We have received papers from India, Malaysia, Italy and Singapore. The broad representation of research and application topics as well as different countries and institutions in the conference, consolidates IConSIP-2016 proceedings with broad appeal to all aspects of Signal and Information Processing research. So the greatest "thank you" has to go to authors for their continuous support to IConSIP- 2016. We are grateful to all those who have contributed to the success of IConSIP-2016. We hope that all the participants and other interested readers benefits scientifically from the proceedings and also find it stimulating in the process. Finally, we would like to wish you success in your technical presentations and social networking. We hope you have a unique, rewarding, enjoyable and fruitful event at Nanded (MS), India.

With warmest regards

Abhijeet Nandedkar	**Manesh Kokare**
Sanjiv Bonde	**Mukul Sutaone**
Publication Chairs	**S Narayana Reddy**
	Program Chairs

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College of Engineering Pune, India

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Prof. M.V. Bhalerao	**Mr. V. S. Kadtan** (Account Officer)	**Mr. Hardeep Huzuriya**

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The organizing committee shall remain indebted to the following eminent personalities for their support to the conference

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

Prof. Subra Ganeshan
Oakland University Rochester, Michigan, USA

Prof. Peter W. MacFarlane
University of Glasgow, UK

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IISc Bangalore, India.

Prof. Santanu Chaudhury
Professor, IIT Delhi, India.

Prof. C. V. Jhawahar
Professor, IIIT Hyderabad, India.

Prof. S. C. Datta Roy
Former Professor, IIT Delhi, India.

The First International Conference on Signal and Information Processing (IConSIP) was organized during 6th to 8th 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.

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, Alberta, 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

Preconference Tutorials:
Dr. Bruno Lay :Topic: Mathematical Morphology and New Trends in Image Processing
Dr. Fawnizu : Topic: Performance Enhancement of Electronic Circuit

Dr. Bruno Lay, CEO, ADCIS, France

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

DAY1

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, SGGSIE&T, Nanded

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

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

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

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

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

Dr. M. B. Kokare, Coordinator, CoE (S&IP), SGGSIE&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". Session chaired by
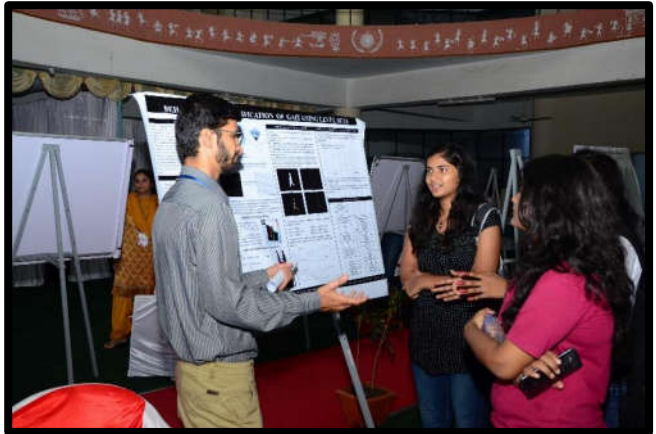
03.20 – 05.00 pm: Oral Presentations Session - 2

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, Canada 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". Session chaired by

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.

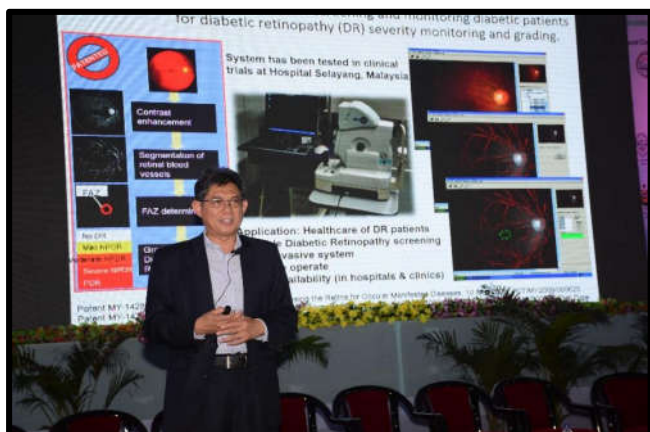| Track	Theme	Session Chairs
Track 1	Signal Processing	Dr. Tapankumar Gandhi, IIT, Delhi Prof. Y. V. Joshi, SGGSIE&T, Nanded
Track 2	Content based Image Retrieval	Dr. S. Murala, IIT, Ropar Prof. R. S. Holambe, SGGSIE&T, Nanded
Track 3	Medical Image Processing	Dr. M. Kolekar, IIT, Patna Dr. Minakshi Thakur,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

03.20 – 05.00 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, SGGSIE&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.

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, SGGSIE&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 Awards:

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

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, SGGSIE&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, SGGSIE&T, Nanded, India / UTP, Malaysia
3	354	Parmeshwar Birajadar, IIT, Bombay, India

Conference Ended with Vote of Thanks

Conference Venue:
Shri Guru Gobind Singhji Institute of Engineering and Technology, Nanded, India.

Shri Guru Gobind Singhji Institute of Engineering and Technology (SGGSIE&T), Nanded established in 1981 has grown to the level of being recognized as a leader in the area of technical education and research. Started with just two undergraduate programs, it now offers 10 undergraduate and 09 postgraduate programs. It offers Ph. D. program under its affiliating University, Swami Ramanand Teerth Marathwada (SRTM) University, Nanded. Pragmatic Management of the Institute has taken proactive steps to depute faculty to various IITs and NITs for higher studies. The faculty not only acquired higher qualifications but also brought back along with them the culture of these premier organizations. SGGSIE&T is rich in highly qualified faculty with more than 50% of the regular faculty being doctorates
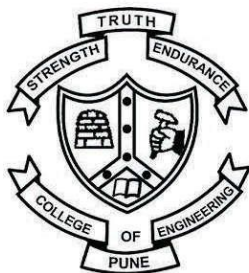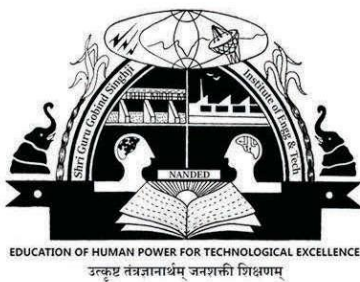
The Institute has state of the art equipment and machinery for teaching as well as research / consultancy services. Faculty have contributed in being way for laboratory development through proposals to various funding agencies like AICTE, DST, BARC, NRB, etc other than the funding obtained under two phases of TEQIP and from Government of Maharashtra. Most of the laboratories are kept open for the students 24 × 7. Four of the institute's departments have FIST sponsored laboratories. Faculty research abilities have led to the establishment of a "Centre of Excellence" in the area of Signal and Image Processing under TEQIP. Scholarships are made available to the full time research scholars from Center of Excellence (CoE) in signal and image processing, Technical Education Quality Improvement Program (TEQIP), Quality Improvement Program (QIP) and Visvesvaraya Ph.D. Scheme for Electronics & IT of DeitY. Sponsored and Joint Research projects with various organizations such as BRNS and NRB represent other feathers in the cap of this Institute.

Prof. Manesh Kokare
Program Chair
IConSIP 2016

Prof. L. M. Waghmare
Patron
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