XXXV National Systems Conference
NSC-2011

December 9-11, 2011

Theme : Energy Sustainability through Intelligent System Design

Organised by

School of Electrical Sciences (SES)

INDIAN INSTITUTE OF TECHNOLOGY BHUBANESWAR

Bhubaneswar - 751 013
Odisha, India

In association with

INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

&

SYSTEMS SOCIETY OF INDIA

THE ORGANISATIONS

IIT BHUBANESWAR

Indian Institute of Technology Bhubaneswar (IIT BBS) currently offers science based engineering education through undergraduate (B.Tech), doctoral (Ph.D) and research programmes. It was established in 2008 in the campus of its mentor organization, IIT Kharagpur. In the subsequent year IIT BBS started operating from Bhubaneswar as a fully-functional institute. The permanent campus of the Institute is spread over 936 acres in Argul on the outskirts of Bhubaneswar.

IIT BBS has academic programmes in the areas of Electrical Sciences, Mechanical Sciences, Infrastructure, Basic Sciences and the Humanities, Social Sciences & Management. The Institute is engaged in nationally and internationally funded sponsored research and industrial consultancy as well as in various research collaborations.

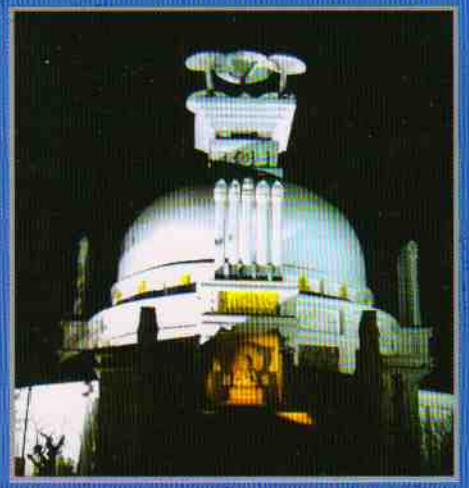
The School of Electrical Sciences runs an undergraduate programme in Electrical Engineering where students get exposure to areas of Electrical Engineering, Electronics and Telecommunication and Computer Sciences. In addition, Ph.D. programmes in various disciplines of Electrical Sciences are offered.

IIT KHARAGPUR

The Indian Institute of Technology Kharagpur (IIT Kharagpur or IIT KGP) is an autonomous engineering technology and management oriented institute of higher education established by the Government of India in 1951, the first of the original five IITs to be established. It is officially recognised as an Institute of National Importance by the Government of India. IIT Kharagpur has several academic departments, multi disciplinary centers, and schools in addition to various laboratories, well equipped library and central research facilities. It has about 500 faculty members and 10,000 students living on the campus. IIT Kharagpur runs UG, PG and Doctoral research programmes and also carries out R & D in collaboration with several national and international organizations. Today, It is regarded as one of the best engineering institutions in India.

NSC

National Systems Conference (NSC) is an annual event of the Systems Society of India (SSI), which is devoted to strengthen the systems, science & technology, and its applications for the welfare of the society. NSC facilitates interaction between engineers, scientists, researchers, entrepreneurs and academicians working in various fields. The 35th NSC is going to be held at the Indian Institute of Technology Bhubaneswar during December 9-11, 2011.



Bhubaneswar is the capital of the Indian state of Odisha. The city has a long history of over 2000 years starting with Chedi dynasty (around 2nd century BC) who had Sisupalgarh near present-day Bhubaneswar as their capital. Historically Bhubaneswar has been known by different names such as Toshali, Kalinga Nagari, Ekamra Kanan, Ekamra Khetra and Mandira Malini Nagari (city of temples) otherwise known as the temple city of India. Bhubaneswar today is a center of education, economic and religious importance in the region.

It's proud possession of magnificent sculptures and architectural heritage, coupled with the sanctity as Ekamrakshetra makes this one of the great religious centres of Odisha since early medieval days.

Together with Puri, Konark and Bhubaneswar forms the Swarna Tribhuja (the Golden Triangle) one of the most visited destinations in East India.

The climate in Bhubaneswar is moderate with temperature ranging from 10°C & 25°C during December.

THEME OF NSC - 2011

The theme of this year's conference is "Energy Sustainbility through Intelligent System Design". The conference will focus on the applications of systems to conservation, transmission, storage and utilization of energy by leveraging technology for sensors, communication and computation.

Organizing Committee :

Patron : Prof. M. Chakraborty, Director
Chairman : Prof. G. Panda, SES
Convener : Prof. P. K. Sahu, Head, SES
Organizing Secretary : Prof. D. Ghosh, SES
Treasurer : Prof. S. K. Nayak, SES

Members :

Prof. S. C. Desarkar, SES
Prof. C. N. Bhende, SES
Prof. A. K. Ojha, SBS
Prof. S. K. Mahapatra, SMS
Prof. S. N. Panigrahi, SMS
Prof. D. Pasla, SIF
Prof. D. Sahoo, SHS & M
Prof. S. Chowdhuri, SBS

Technical Chairs :

Prof. G. Panda, IIT BBS
Prof. S. Mukhopadhyay, IIT KGP

TOPICS OF INTEREST

NSC-2011 welcomes papers in all areas related to system design encompassing but not limited to the following topics :

- Aerospace Systems and Aerodynamics
- Bio and Nano Mechanics
- Biomedical Systems
- Business Modeling and Social Systems
- Communication Systems
- Control systems
- Data Networks
- Embedded Systems
- Energy Harvesting
- Modeling and Simulation
- Optimization Techniques
- Power and Energy Systems
- Power Electronics and Drives
- Process Instrumentation
- Renewable Energy
- Robotics and Automation
- Sensors and Sensor Networks
- Signal & Image Processing
- Soft Computing Techniques
- System Reliability
- System Test and Verification
- System Theory

SUBMISSION MODE :

One copy of the full paper not exceeding 6 pages, typed on one side of A4 sheet as per IEEE double column format should be sent to the Organizing Secretary by e-mail at nsc11@iitbbs.ac.in. The accepted paper received with full registration fees will be published in the proceedings of the conference.

REGISTRATION DETAILS :

Interested participants are requested to fill up the registration form and send it along with the registration fee to the Organizing Secretary. The registration fee per participant, to be paid by Demand Draft, drawn in favour of "Convener NSC 2011" and payable at Bhubaneswar, is as given below.

a) Industry participant : Rs. 5000

b) Participants from R & D / Academics Institutes : Rs. 3500

c) Students participants Rs. 1500

Fee entitles the delegates to participate in technical sessions, soft copy of the processing, working lunch and refreshments. Life members of SSI will get a concession of 20% over the applicable registration fee amount.

Accommodation may be arranged upon request for a limited number of participants.

ADDRESS FOR CORRESPONDANCE

Prof. D. Ghosh
Organizaing Secretary, NSC-2011
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IIT Bhubaneswar
Bhubaneswar - 751 013, Odisha, India

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E-mail : nsc11@iitbbs.ac.in
Website : www.iitbbs.ac.in

IMPORTANT DATES

Submission of manuscript : 01-07-2011
Notification of acceptance : 15-09-2011
Submission of final paper : 15-10-2011
Last date for Registration : 15-11-2011

REGISTRATION FORM (NSC-2011)

1. Full Name : (In Block Letters) .....
   .....
2. Designation : .....
3. Department : .....
4. Organization : .....
5. Address : .....
   .....
   .....
6. Phone No.: .....
7. Fax No.: .....
8. E-mail : .....
9. Type of Participation :
   Paper Presentation / Poster Presentation / Audience
10. Accommodation : Required / Not Required
11. Details of Registration Fee :
    Amount:..... DD No.:.....
    Bank: ..... Date :.....
12. SSI Life Membership No. (If applicable).....
    Note : Please make additional copies, if required.

35th National System Conference (NSC-2011)

Programme Schedule

Day-01: 09.12.11											
Event	Registration	Inauguration and Awards Ceremony	High Tea	Plenary Talk-1 (Prof. B. Yegnanarayana)	Plenary Talk-2 (Prof. V. M. Gadre)	Lunch Break	Plenary Talk -3 (Prof. S. Mukhopadhaya)	Plenary Talk -4 (Prof. G. Panda)	Local Site Seeing	SSI General Body Meeting	Banquet Dinner
Timing	09:00 am-09:45 am	09:45 am - 11:10 am	11:10 am-11:30 am	11:30 am - 12:20 pm	12:25 pm-01:15 pm	01:15 pm-02:15 pm	02:25 pm-03:15 pm	03:20 pm-04:10 pm	04:15 pm-06:15 pm	04:15 pm -06:15 pm	06:45 pm-08:30 pm

Day-02: 10.12.11									
Event	Technical Session-1 Technical Session-1A Systems Applications Technical Session-1B System Identification and Optimization	Tea Break	Plenary Talk -4 (Prof. P. N. Ghosh)	Lunch Break	Technical Session-2 Technical Session-2A Communication Systems Technical Session-2B Control Systems	Tea Break	Plenary Talk -5 (Prof. P. K. Dash)	Plenary Talk -6 (Shri Abhay Samant, NI)	Dinner
Timing	09:00 am -11: 35 am	10:00 am - 10:15 am	11:40 am-12:30 pm	12:30 pm - 01:30 pm	01:30 pm- 03:30 pm	03:30 pm -03:45 pm	03:45 pm-04:35 pm	04:45 pm-05:35 pm	06:45 pm-08:30 pm

Day-03: 11.12.11				
Event	Technical Session-3 Technical Session-3A Algorithm for Systems Technical Session-3B Power Systems and Modeling	Tea Break	Valedictory	Lunch
Timing	09:00 am -12:15 pm	10:00 am - 10:15 am	12:25 pm-01:00 pm	01:00 pm - 02:00 pm

Venue: Registration: Institute Auditorium; Inauguration and Awards Ceremony: Institute Auditorium

Inauguration and Awards Ceremony Schedule:

09:45 am: Lighting of the Lamp by Dignitaries

09:50 am: Welcome address by Prof. M. Chakraborty, Director IIT Bhubaneswar

10:05 am: Address by the Chairman, Organizing Committee, Prof. G. Panda, Deputy Director, IIT Bhubaneswar

10:20 am: Address by the Chief Guest, President, SSI, Prof. P. K. Kalra, Director IIT Jodhpur

10:35 am - 11:05 am: Award Ceremony of Systems Society of India (SSI)

11:05 am: Vote of thanks by the Convener, Organizing Committee, Prof. P. K. Sahu, Head, School of Electrical Sciences, IIT Bhubaneswar

Invited Speakers:

Prof. B. Yegnanarayana, Professor and Microsoft Chair, IIIT Hyderabad

Title: Challenges in processing natural signals like speech

About the Speaker: Dr. Bayya Yegnanarayana is a professor and Microsoft Chair at the International Institute of Information Technology (IIIT) Hyderabad. Prior to joining IIIT, he was a professor at IIT Madras (1980 to 2006), a visiting associate professor at CMU, Pittsburgh, USA (1977 to 1980), and a member of the faculty at IISc, Bangalore, (1966 to 1978). He received BSc from Andhra University in 1961, and BE, ME and PhD from IISc Bangalore in 1964, 1966, and 1974, respectively. His research interests are in signal processing, speech, image processing and neural networks. He has published over 350 papers in these areas. He is also the author of the book "Artificial Neural Networks", published by Prentice-Hall of India in 1999. He has supervised 29 PhD and 36 MS theses. He is a Fellow of the Indian National Academy of Engineering, a Fellow of the Indian National Science Academy, and a Fellow of the Indian Academy of Sciences. He was the recipient of the 3rd IETE Prof.S.V.C.Aiya Memorial Award in 1996. He received the Prof.S.N.Mitra memorial Award for the year 2006 from the Indian National Academy of Engineering. He was an Associate Editor for IEEE Transactions on Audio Speech and Language Processing during 2003-2006.

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

Title: Wavelets and their use in systems

About the Speaker: Prof. V. M. Garde is an eminent person in the field of Communication and Signal processing. He is currently working as a professor in Dept. Of Electrical Engineering IIT, Bombay. He completed the B Tech and PhD degree from IIT Delhi. He was the recipient of Young Engineer Award from the INAE for the year 2001. He received the award for Excellence in Teaching from IIT Bombay in September 1999, Sept. 2004 and Sept. 2009. He is working as principal investigator in several research projects sponsored by Naval Research Board (NRB) , CRL - Bangalore and AICTE, Govt. of India. He has guided 9 PhD and 65 M Tech scholars. He has published 30 research articles in pear reviewed national and international journals. His area of research interest includes multiresolution and multirate signal processing, wavelets, video compression, communication systems and advanced signal processing.

Prof. S. Mukhopadhaya, Professor, IIT Kharagpur

Title: Ballistic Target Tracking: A Case Study of Real World Kalman Filtering

About the Speaker: Prof. Siddhartha Mukhopadhyay is presently working as a professor in Dept. of Electrical Engineering IIT, Kharagpur. He is known throughout the country as an expert in Control Systems and Automation. He completed the B Tech, M Tech and PhD degree from IIT Kharagpur. He received the UGC Young Teachers' Career Award in 1993. He was the recipient of INSA young scientist award and INAE young engineer award in 1997. He is the Vice-President of System Society of India. He is the principal investigator of nine research projects sponsored by DRDO, ARDB, BARC, DIT Govt of India etc. He has published 30 research articles in pear reviewed national and international journals. He has guided 14 PhD scholars (out of which 4 awarded degree and 10 are in pipeline). His area of interest includes Dynamic Systems and Control, Estimation, Monitoring, Detection and Diagnosis, Behavioral Modelling, CAD and Testing of Analog and Mixed Signal VLSI Systems, Industrial Instrumentation, Aerospace Tracking and Control.

Prof. G. Panda, Deputy Director, IIT Bhubaneswar

Title: Design, development and applications of intelligent instrumentation systems

About the Speaker: Prof. Ganapati Panda is presently working as a Deputy Director and Professor, School of Electrical Sciences, Indian Institute of Technology, Bhubaneswar, India. Prior to this he was working as Dean (Academic Affairs) at IIT Bhubaneswar and as Dean (Administration) at National Institute of Technology, Rourkela. He acted as Co-ordinator, World Bank Project at National Institute of Technology, Rourkela. He was selected as the first Vice Chancellor of VeeraSurendraSai University of Technology, Burla. He has served 38 years in teaching and research in leading technical institutions of India. He also served as Director of National Institute of Technology, Jamshedpur. He did his Post Doctoral research work at the University of Edinburgh, UK (1984-86) and Ph. D. from IIT, Kharagpur in 1981 in the area of Electronics and Communication Engineering. He has already guided 21 PhDs in the field of Signal Processing, Communication and Soft-computing and has published more than 300 research papers in various referred International and Indian Journals and conferences. Most of his research papers are extensively cited. He has successfully completed number of research projects from AICTE, MHRD, ISRO, DRDO, DST and British Council, UK. He has also edited two books in the area of DSP. He was nominated as the Fellow of the National Academy of Engineering, India (FNAE) and Fellow of National Academy of Science, India (FNASc.) for his significant research contribution to signal processing and telecommunication. He also received Samanta Chandra Sekhar award from the department of Science and Technology, Govt. of Orissa for his high quality research work in the field of Engineering. His research interests are Digital Signal Processing, Digital Communication, Soft Computing, Intelligent Instrumentation, Evolutionary Computing, Computational Finance, Sensor Networks and Distributed Signal Processing.

Prof. P. N. Ghosh, VC, Jadavpur University

Title: High Precision Measurement with Diode Laser

About the Speaker: Dr. Pradip N. Ghosh is the vice-chancellor of Jadavpur University at Kolkata. Prior to joining as VC at Jadavpur University, he was a Professor of Physics and Dean of the Faculty of Science University of Calcutta. He has visited Germany as an Alexander von Humblodt Fellow on various occasions (1988 – 2011) and in 1988 visited Nobeyama Radio Observatory as a Senior Invitation Fellow of the Japan Society for the Promotion of Science (JSPS). He was also a Visiting Professor at Indiana University (1993) and a Post-doctoral Fellow at the Swiss Federal Institute of Technolohy (ETH, Zurich) (1978 – 81). He received his BSc and MSc from Presidency College, Calcutta University in 1967 and 1969 respectively and PhD from Calcutta University in 1976. His research interests are in laser spectroscopy and Atomic and Molecular Physics.

Prof. P. K. Dash, Professor, SOA University

Title: Intelligent Systems

About the Speaker: He is the Director, Research and Consultancy at the Multidisciplinary research Center of SOA University

Shri. Abhay Samant, R&D Section Manager at National Instruments

Title: Communication Engineering Technology with focus on advancements in SDR, MIMO and Antenna Test Systems

About the Speaker: Abhay Samant is R&D Section Manager at National Instruments. His research and development activities are in the area of RF and Wireless Communications. Currently, he heads a team of engineers who are working on various RF cellular and wireless connectivity standards. Prior to joining National Instruments in 1996, Abhay received his Master of Science degree in Computer Science from the University of Illinois at Urbana-Champaign in 1994 and his Master of Science in Electrical Engineering from the University of Kentucky at Lexington in 1992. Abhay Samant is co-inventor for 5 patents and has published numerous journal and conference papers. Abhay Samant is co-author of the book "LabVIEW Signal Processing" published by Prentice Hall.

Session Details

Session 1A: Systems Applications
Venue: VC, Room No. 204
Timing: 10.12.11, 9.00 am – 11.35 am
Session Chair:

9.00 am: Dr. Mrinalini Das, Assam Engineering Institute, Guwahati

Title: Study of Climate Change Impact On Residential, Commercial And Industrial Consumer of Guwahati

9.20 am: P. Sharath Kumar, National Institute of Technology Warangal, Warangal

Title: Hybrid High Frequency Resonant Inverter for Induction Heating Cooking Appliances

9.40 am: Punit Kumar, National Institute of Technology Kurukshetra, Kurukshetra

Title: Marginal Prices based on Social Welfare with TCSC in Electricity Markets

10.00 am: Tea Break

10.15 am: R. Subramaniam, Cognizant Technology Solutions, P. J. Sathish Kumar and S. Arun, Anna University, Chennai

Title: Implementing High Performance Lexical Analyzer using CELL Broadband Engine Processor

10.35 am: J. K. Arora, Dayalbagh Educational Institute, Agra

Title: HPLC Estimation of Cholesterol in edible oils with Genetic Algorithm

10.55 am: Malaya Kumar Nath, Indian Institute of Technology Guwahati, Guwahati

Title: PCA and LDA based Approach to Glaucoma Classification from Color Fundus Images

11.15 am: T S S Subramanian, Hindustan College of Science & Technology, Mathura

Title: An Overview of Emerging Medical Applications of Virtual Reality

Session 1B: System Identification and Optimization

Venue: Room No. 205
Timing: 10.12.11, 9.00 am – 11.35 am
Session Chair: Prof. S. R. Samantaray, School of Electrical Sciences, IIT Bhubaneswar

9.00 am: S. Senthilvel, Thiagarajar College of Engineering, Madurai
Title: Pattern based TME for low pin count DFT chips

9.20 am: Tukaram Moger, National Institute of Technology Karnataka, Surathkal

Title: Application of Genetic Algorithm to Reactive Power Optimization

9.40 am: Dr. Utkal V. Mehta, Indian Institute of Technology Guwahati, Guwahati

Title: On-line Relay Autotuning For Process Identification

10.00 am: Tea Break

10.15 am: Mitali Shrivastava, National Institute of Technology Raipur, Raipur

Title: PWM Multilevel Inverter to Reduce Total Harmonic Distortion

10.35 am: Karuppanan P, National Institute of Technology Rourkela, Rourkela

Title: Cascaded Voltage Source Inverter based Active Power Line Conditioners

10.55 am: Subhanga Kishore Das, BOSE, Cuttack

Title: Mesh Generation and Optimization through Minimization of Energy Function

11.15 am: Apurva Narayan, University of Waterloo, Waterloo, Canada

Title: Neuro-Fuzzy (m-ANFIS) based Technique for Short-Term Load Forecasting in Large Geographical Area: Ontario, Canada

Session 2A: Communication Systems

Venue: VC, Room No. 204
Timing: 10.12.11, 1.30 pm – 3.10 pm
Session Chair: Prof. N. V. L. N. Murthy, School of Electrical Sciences, IIT Bhubaneswar

1.30 pm: Ruchita Agarwal, BMS College of Engineering, Bangalore

Title: TDMA Scheduling in Cross Layer Optimized Clus-tered Wireless Sensor Networks

1.50 pm: Aswini Kumar Nayak, Veer Surendra Sai University of Technology, Burla, Orissa

Title: Optimal Network Reconfiguration Using Interior Point Method

2.10 pm: D. Kranthi Kumar, Institute of Technology, Banaras Hindu University, Varanasi

Title: Model Order Reduction of Interval Systems Using Modified Routh Approximation and Factor Division Method

2.30 pm: Deepak Kumar, Institute of Technology, Banaras Hindu University, Varanasi

Title: Model Order Reduction of SISO Systems by Modified Hankel Norm Approximation Technique

2.50 pm: Bijayananda Patnaik, Indian Institute of Technology Bhubaneswar

Title: Ultra High Bit-Rate DWDM System Design and Simulation for Future Optical Network

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Session 2B: Control Systems

Venue: Room No. 205
Timing: 10.12.11, 1.30 pm – 3.10 pm
Session Chair: Prof. A. Ghosh, School of Electrical Sciences, IIT Bhubaneswar

1.30 pm: Ravi Shankar, Indian School of Mines, Dhanbad

Title: Optimal Design of PID Controller for Hydro Power Plant

1.50 pm: Dola Gobinda Padhan, Indian Institute of Technology Guwahati, Guwahati

Title: An Improved Cascade Control Structure for Time Delay Processes

2.10 pm: Sanjoy Mondal, Indian Institute of Technology Guwahati, Guwahati

Title: Controlling Uncertain Systems with Variable Gain based Second Order Integral Sliding Mode Controller

2.30 pm: Swetananda Jena, National Institute of Technology Rourkela, Rourkela

Title: Robust Sensorless Field Oriented Control of Induction Motor Using Sliding Mode

2.50 pm: Jose. P. Therattil, National Institute of Technology Rourkela, Rourkela

Title: Transient Stability Enhancement of a Power System with Unified Power Flow Controller using Pole Placement Technique

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Session 3A: Algorithm for Systems

Venue: VC, Room No. 204
Timing: 11.12.11, 9.00 am – 11.35 am
Session Chair: Prof. S. C. De Sarkar, School of Electrical Sciences, IIT Bhubaneswar

9.00 am: Vinod Kumar, Institute of Technology, Banaras Hindu University, Varanasi

Title: Clustering Method for Reducing Order of Linear System using Factor Division Algorithm

9.20 am: Harish Balaga, Institute of Technology, Banaras Hindu University, Varanasi

Title: Protection of 3-Phase Power Transformer Using ANN Based Pattern Recognition Technique

9.40 am: M. Pattnaik, Utkal University, Bhubaneswar

Title: An Optimal Inventory Policy Involving Reliability and Demand-Dependent Unit Cost with Fuzzy System Cost for an Imperfect Production Process

10.00 am: Tea Break

10.15 am: R.S.S. Prasanth, Dayalbagh Educational Institute, Agra

Title: Process Optimization of Plane Turning Using Artificial Bee Colony Algorithm

10.35 am: J. Vijaya Kumar, National Institute of Technology Warangal, Warangal

Title: Bidding Strategies for Generators and Large Consumers using Bacterial Foraging Algorithm

10.55 am: Soniya, Dayalbagh Educational Institute, Agra

Title: A Detailed Study on the Design of Integrated Compact Evolutionary-Fuzzy System for Function Approximation

11.15 am: Rosalin Mahapatra, ITER, Siksha O Anusandhan University, Bhubaneswar

Title: Efficient Classification of Cancer Patients using Artificial Neural Network

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Session 3B: Power Systems and Modeling

Venue: Room No. 205
Timing: 11.12.11, 9.00 am – 11.55 am
Session Chair: Prof. C. N. Bhende, School of Electrical Sciences, IIT Bhubaneswar

9.00 am: Pradeep Kumar, National Institute of Technology Jamshedpur, Jamshedpur

Title: Power Factor Correction Of D-STATCOM in Power Quality Enhancement

9.20 am: Bindeshwar Singh, Kamla Nehru Institute of Technology Sultanpur

Title: Enhancement of Voltage Stability by Coordinated Control of Multiple FACTS Controllers in Multi-Machine Power System Environments

9.40 am: Deepak Kumar, Institute of Technology, Banaras Hindu University, Varanasi

Title: Reduction of Power System Models using Balanced Singular Perturbation Approximation

10.00 am: Tea Break

10.15 am: Kanhu Charan Bhuyan, National Institute of Technology Rourkela, Rourkela

Title: An Active and Reactive Power Analysis of Solid Oxide Fuel Cell

10.35 am: Nagireddy Ravi, Andhra Pradesh Power Generation Corporation Limited, Nalgonda

Title: Fault Detection in Synchronous Generators using Principal Component Analysis

10.55 am: S. Prabakaran, ABB Corporate Research Centre, Bangalore

Title: Parameter Sensitivity Study on IEC Thermal Model of Power Transformers

11.15 am: K. Chakrabarty, Kalyani Govt. Engineering College, Kalyani

Title: Control of Chaos in DC Drives

11.35 am: S.G. Malla, Indian Institute of Technology Bhubaneswar, Bhubaneswar

Title: Solar based Stand-Alone Power System with Battery and Fuel Cell

11:55 am: Yash Pal, National Institute of Technology Kurukshetra, Kurukshetra

Title: Single-phase Synchronous d-q Reference Frame Controller for Single-Phase UPQC