# CONFERENCE PROGRAMME

## International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET -2020)

**10-11, July 2020**

## DAY 1: 10-07-2020

| Time | Programme |
|---|---|
| **09:30-10:30** | **Inaugural Session** |
| **10:30-11:10** | **Plenary Talk 1– Prof. Sujit Kumar Biswas, Vice Chair Technical Activities, IEEE India Council.** |
| **11:10–11:25** | **Break** |
| **11:25-14:15** | **Day 1 \| Technical Session-1**<br>**Power System Control and Protection (Venue: Hall-1)** |
| **11:25-11:45** | **Invited Talk – Prof. Kalyan Chatterjee, ISM Dhanbad** |
| 11:45 – 12:00 | Paper ID:10<br>Title: Short Term Load Forecasting: A Hybrid Approach Using Data Mining Methods<br>*Authors: Pallavi Borthakur and Barnali Goswami* |
| 12:00 – 12:15 | Paper ID:15<br>Title: Modelling and Simulation of Electrically Exploding Wire Opening Switch for Pulse Compression<br>*Authors: Pankaj Soni, Harsh Sharma, Radhesh Dewett, Sangeeta Gulati and H K Gupta* |
| 12:15 – 12:30 | Paper ID:18<br>Title: Effect of change in Environmental factors on coordination of overcurrent relays with DG Integration<br>*Authors: Jayant Mani Tripathi, Adhishree Srivastava and Dr. Sanjeev Kumar Mallik* |
| 12:30 – 12:45 | Paper ID:21<br>Title: S-Transform Assisted CUSUM Based Protection Strategy for Transmission Lines Possessing UPFC<br>*Authors: Sauvik Biswas, Vishal Parhi, Anudeep Bhatraj and Paresh Kumar Nayak* |
| 12:45 – 13:00 | Paper ID:26<br>Title: Performance Analysis of HVDC Lines Using Surge Arrester<br>*Authors: Shobha Agarwal, Rakesh Kumar Singh and Vimlesh Verma* |
| 13:15 – 13:30 | Paper ID:28<br>Title: Load Shifting Based DSM Strategy for Peak Demand Reduction in a Microgrid<br>*Authors: Jwala Prasad, Taksh Jain, Nishant Sinha and Sneha Rai* |
| 13:30 – 13:45 | Paper ID: 60<br>Title: Accommodative Energy Market for Battery Energy Storage and Grid Balancing<br>*Authors: Asif Nazar and Dr. Naqui Anwer* |
| 13:45 – 14:00 | Paper ID: 106<br>Title: Role of Demand Side Management in Automatic Load Frequency control<br>*Authors: Swetalina Bhuyan, Sunita Halder Nee Dey and Subrata Paul* |

## Power Electronics and Drives (Venue: Hall-2)

**11:25-11:45** **Invited Talk – Dr. R. K. Behera, IIT Patna**

11:45 – 12:00 Paper ID:16
Title: Fault-Tolerant Converter Topology for Speed Control of Induction Motor Drive
*Authors: Bhaskar S S Gupta Yelamarthi and Srinivasa Rao Sandepudi*

12:00 – 12:15 Paper ID: 30
Title: Scalar Control of Induction Motor Drive with Inverter Fault-Tolerance Capability
*Authors: Bhaskar S S Gupta Yelamarthi and Srinivasa Rao Sandepudi*

12:15 – 12:30 Paper ID: 41
Title: Performance Analysis of Brushless Direct Current Motor Drive for Different types of DC-DC Converter Using MPPT
*Authors: Sweety Kumari and Ramesh Kumar*

12:30 – 12:45 Paper ID: 44
Title: Torque Ripple reduction of BLDC motor introducing Delay in the Gate Firing Circuits
*Authors: Susanta Ray and Ritam Chakraborty*

12:45 – 13:00 Paper ID: 51
Title: A new generalized topology of multilevel inverter with reduce number of DC sources and switches
*Authors: Avinash Maurya and Ambarisha Mishra*

13:00 – 13:15 Paper ID: 62
Title: Novel Reduced Switch 9-Level DC/AC Converter With Unequal Sources
*Authors: Rajesh Kumar Mahto and Ambarisha Mishra*

13:15 – 13:30 Paper ID: 64
Title: Mathematical Modelling, Simulation and Control of Five-Phase Induction Motor Drives
*Authors: Sartaz Ahmad and Ambarisha Mishra*

13:30 – 13:45 Paper ID: 67
Title: Effectiveness of Space Vector PWM in Three-Phase Inverter
*Authors: Sweta Kumari and Rajib Kumar Mandal*

13:45 – 14:00 Paper ID: 80
Title: Modelling of Hybrid Electric Vehicle Charger and Study the Simulation Results
*Authors: Abhishek Gaurav and Anurag Gaur*

14:00 – 14:15 Paper ID: 105
Title: Comparative Analysis of Different Converter Topologies for an SRM Drive with Conventional and Vector Control Schemes
*Authors: Yawer Abbas Khan, I.S. Twinkle, Shashi Kumar and Vimlesh Verma*

**14:15–14:30** **Break**

**14:30–17:00**

# Day 1 | Technical Session-2

## Power System Optimization (Venue: Hall-1)

**14:30–14:50** **Invited Talk – Prof. P. Acharjee, NIT Durgapur**

14:50–15:05 Paper ID: 7
Title: Multi-point Optimal Placement of Shunt Capacitor in Radial Distribution Network: A Comparison
*Authors: Dibya Bharti*

15:05–15:20 Paper ID: 61
Title: Optimal Non-convex Combined Heat and Power Economic Dispatch Using Particle Swarm Optimization
*Authors: Siddharth Suhas Joshi, G Rahul Prashanth, Vinay Kumar Jadoun, Anshul Agarwal and Saurabh Kumar Pandey*

15:20–15:35 Paper ID: 69
Title: Hybrid Intelligence Technique for Reactive Power Planning using FACTS devices
*Authors: Nihar Karmakar, Saurav Raj and Biplab Bhattacharyya*

15:35–15:50 Paper ID: 72
Title: A Novel Optimization Technique for LFC and Virtual Inertia Emulation of A Multi Area Hybrid Power System
*Authors: Sariki Murali, Ravi Shankar and Pulakraj Aryan*

15:50–16:05 Paper ID: 76
Title: An Improved 3-Phase Load Flow for DG Integrated Distribution Systems Based on PSO
*Authors: Sudhakar Reddy Sama, Subrata Paul and Sunita Halder Nee Dey*

16:05–16:20 Paper ID: 77
Title: SOS Based Solution for Optimization of Indian Power System
*Authors: Nagendra Palukuru, BalaChnennaiah P and Vaisakh K*

16:20–16:35 Paper ID: 87
Title: Application of Quasi Opposition Based Whale Algorithm For LFC of Multi-area Deregulated Power System Using Fractional Controller
*Authors: Ashiwani Kumar, Prabhat Kumar Vidyarthi and Pulakraj Aryan*

16:35–16:50 Paper ID: 89
Title: Interactive Search Algorithm Based Automatic Generation Control Using Cascade Control and UPFC
*Authors: Utkarsh Raj, Ravi Shankar and Pankaj Rai*

16:50–17:05 Paper ID: 93
Title: Optimal Power Flow with BAT algorithm for a Power System to reduce transmission line losses using SVC
*Authors: Lakshmi P, Venkateswara Rao Bathina, Ramesh Devarapalli and Pankaj Rai*

# Automation and Signal Processing (Venue: Hall-2)

**14:30–14:50 Invited Talk – Dr. Paramita Guha, CSIR-CSIO, Chandigarh**

14:50–15:05 Paper ID: 48
Title: Path Planning of UGV using Sampling Based Method and PSO in 2D Map Configuration: A Comparative Analysis
*Authors: Rahul Prakash, Dr. Dharmendra Kumar Dheer and Dr. Mukesh Kumar*

15:05–15:20 Paper ID: 52
Title: Estimation of Theophylline in Black Tea Using NIR Spectroscopy
*Authors: Shreya Nag, Debangana Das, Hemanta Naskar, Runu Banerjee Roy, Bipan Tudu and Rajib Bandyopadhyay*

15:20–15:35 Paper ID: 53
Title: Discrimination of Various Clones of Black Tea Using NIR Spectroscopy
*Authors: Debangana Das, Shreya Nag, Hemanta Naskar, Ajanta Kumar Hazarika, Runu Banerjee Roy, Santanu Sabhapondit, Bipan Tudu and Rajib Bandyopadhyay*

15:35–15:50 Paper ID: 54
Title: Development of Linseed Oil Based Quartz Crystal Microbalance Sensor for Detection of Trimethylamine
*Authors: Samhita Dasgupta, Barnali Ghatak, Sanjoy Banerjee, Sk Babar Ali, Jyotsna Dei, Bijay Kumar Behera, Runu Banerjee Roy and Bipan Tudu*

15:50–16:05 Paper ID: 55
Title: Fish Freshness Assessment using NIR spectroscopy
*Authors: Jyotsna Dei, Hemanta Naskar, Samhita Dasgupta, Shreya Nag, Bijay Behera, Bipan Tudu, Runu Roy and Rajib Bandyopadhyay*

16:05–16:20 Paper ID: 57
Title: Detection of Curcumin using A Simple and Sensitive Molecularly Imprinted Polymer (MIP) Embedded Graphite Electrode Based Electrochemical Sensor
*Authors: Hemanta Naskar, Sheikh Saharuk Ali, A. H. M. Toufique Ahmed, Debangana Das, Shreya Nag, Bipan Tudu and Rajib Bandyopadhyay*

16:20–16:35 Paper ID: 82
Title: Secured Pulse Rate Monitoring System using IoT and Cloud
*Authors: Aritra Ray and Hena Ray*

16:35–16:50 Paper ID: 104
Title: Self-Supplied Automatic Control of Street Light
*Authors: Surya Rai, Khushboo Kumari and Diwakar Verma*

# DAY 2: 11-07-2020

| Time | Programme |
|---|---|
| **09:30-10:10** | **Plenary Talk– 2: Prof. Ramesh Bansal, Department of Electrical and Computer Engineering, University of Sharjah, Sharjah, United Arab Emirates** |
| **10:10–10:30** | **Break** |
| **10:30-12:50** | **Day 2 \| Technical Session-1** |

## Microgrid and Power Electronic Applications (Venue: Hall-1)

**10:30–10:50** **Invited Talk – Dr. S. K. Parida, IIT Patna**

10:50–11:05 Paper ID: 5
Title: Impact of Distributed Generation on the Reliability Allocation of Distribution System : A Mesh-Grid Approach
*Authors: Sonal S and Debomita Ghosh*

11:05–11:20 Paper ID: 29
Title: Integration of PV, Battery and Supercapacitor in Islanded Microgrid
*Authors: Mahesh Kumar Choudhary and Ashwani Kumar Sharma*

11:20–11:35 Paper ID: 38
Title: A Probabilistic Approach for Reactive Power Compensation in an Active Distribution Network with Wind Based Renewable Integration
*Authors: Amaresh Gantayet and Dharmendra Kumar Dheer*

11:35–11:50 Paper ID: 88
Title: Design and Analysis of the Gate Driver Circuit for Power Semiconductor Switches
*Authors: Ashutosh Kumar Singh, Rajib Kumar Mandal, Ravi Raushan and Pratyush Gauri*

11:50–12:05 Paper ID: 94
Title: Siting and sizing of DG unit to minimize loss in distribution network in the presence of DG generated harmonics
*Authors: Barnali Motling, Subrata Paul and Sunita Halder Nee Dey*

12:05–12:20 Paper ID: 95
Title: Design of a High Gain DC-DC Converter For Renewable Energy Applications
*Authors: Pranjit Kumar Roy, Ajoyjit Ghosh, Ashoke Mondal and Shilpi Bhattacharya*

12:20–12:35 Paper ID: 97
Title: Single-Phase Average Reactive Power Measurement Using Instantaneous Power Theory in a Fixed Point Processor
*Authors: Dipankar Chatterjee and Suvarun Dalapati*

12:35–12:50 Paper ID: 103
Title: Grid Connected Photovoltaic Systems with Multilevel Inverter
*Authors: Ashutosh Kumar Singh, Rajib Kumar Mandal, Ravi Raushan and Pratyush Gauri*

## Sensors and Signal Processing (Venue: Hall-2)

**10:30–10:50** **Invited Talk – Prof. Bipan Tudu, Jadavpur University**

10:50–11:05 Paper ID: 36
Title: CNN Classifier based Low-resolution Face Recognition Algorithm
*Authors: Shyam Singh Rajput and K V Arya*

11:05–11:20 Paper ID: 56
Title: Anisotropic Diffusion Based Unsharp Masking and Crispening for Denoising and Enhancement of MRI Images
*Authors: Ravi Ranjan Kumar, Abhinav Kumar and Subodh Srivastava*

11:20–11:35 Paper ID: 70
Title: Single-channel color image cryptosystem using chaotic structured phase encoding
*Authors: Muhammad Abuturab*

11:35–11:50 Paper ID: 78
Title: Reduced Graphene Oxide/Amino-Nitroso-Uracil Nanocomposite for the Detection of Heavy Metals in Aqueous Environment
*Authors: Pramanand Kumar, Chandramika Bora and Subrata Das*

11:50–12:05 Paper ID: 86
Title: Impact of back gate voltage on sensing metric of dielectric modulated Tunnel FET biosensor
*Authors: Praveen Dwivedi, Amitesh Kumar, Brajendra Singh Sengar, Vivek Garg and Rohit Singh*

12:05–12:20 Paper ID: 92
Title: Effect of applied bias on Schottky interface to affect resistive switching in a memristive device
*Authors: Amitesh Kumar, Praveen Dwivedi, Brajendra Singh Sengar, Vivek Garg and Rohit Singh*

12:20–12:35 Paper ID: 99
Title: Performance Analysis For Wireless Non-Orthogonal Multiple Access Downlink Systems
*Authors: Ashish Pandey, Indrajeet Kumar and Ritesh Mishra*

12:35–12:50 Paper ID: 101
Title: Study of Cognitive Fatigue using EEG Signal Analysis
*Authors: Anwesha Sengupta*

**12:50–13:30** **Break**

**13:30–15:50**

# Day 2 | Technical Session-2

## Renewable Energy and Application (Venue: Hall-1)

**13:30–13:50** **Invited Talk - Prof. N. B. Dev Choudhury, NIT Silchar**

14:05–14:20 Paper ID: 22
Title: Performance Analysis of Parallel-Connected Grid Independent Wind Energy Conversion Systems (WECS) with Energy Storage
*Authors: Sri Datta Sai Polaki, Vidhyadhari Kotipatruni, Harija Rani Kirlampalli and Sastry V. Vedula*

13:00 –13:15 Paper ID:27
Title: Impact of Renewable Sources in AGC for Two Area Interconnected Power System
*Authors: Prateek Sharma, Abhishek Mishra and Ravi Shankar*

14:20–14:35 Paper ID: 31
Title: Investigation of Buffer less Cu2ZnSnS4 Based Solar Cell
*Authors: Prashant Kumar Verma, Pooja Punetha and Brajendra Singh Sengar*

14:35–14:50 Paper ID: 39
Title: Energy Consumption and Energy Saving Potential in Indian Textile Sector
*Authors: Saurabh Kumar Rajput, Dharmendra Kumar Dheer and Sulochana Wadhwani*

14:50–15:05 Paper ID: 66
Title: Investigation of Environmental Effects on the Performance of Solar PV Modules
*Authors: Kalpana Bijayeeni Samal and Abhyarthana Bisoyi*

15:05–15:20 Paper ID: 73
Title: Dynamic participation of DFIG based wind farms for improved frequency regulation
*Authors: Abhishek Saxena, Ravi Shankar and Pankaj Rai*

15:35–15:50 Paper ID: 96
Title: Wind Generation Forecasting Using Python
*Authors: Md Irfan Ahmed, Prateem Pan, Ramesh Kumar and R. K. Mandal*

## Control System (Venue: Hall-2)

**13:30–13:50 Invited Talk – Dr. Abhishek Dey, NIT Rourkela**

13:30–13:45 Paper ID: 47
Title: Robust Least Square Filter for Simultaneous Localization and Mapping
*Authors: Sharifuddin Mondal and Wan Kyun Chung*

13:45–14:00 Paper ID: 63
Title: Equilibrium Optimized AGC of Multi-Area Restructured Power System Using Cascaded Fractional Fuzzy Controller
*Authors: Pulakraj Aryan, Ravi Shankar and Mrinal Ranjan*

14:00–14:15 Paper ID: 75
Title: Discretization of Linear Time-Varying Systems
*Authors: Gagan Deep Meena and JanardhananSivaramakrishnan*

14:15–14:30 Paper ID: 79
Title: Stabilizing x-z Inverted Pendulum via Fractional Order PID Controller
*Authors: Satyendra Kumar and MoinaAjmeri*

14:30–14:45 Paper ID: 83
Title: LFC Scheme for A Deregulated Multi-Area Power System using Cascaded Fractional Order Controller
*Authors: Sariki Murali, Ravi Shankar, ShivamShrivastav, Utkarsh Dhawal and Vishal Kannaujia*

14:45–15:00 Paper ID: 84
Title: Load Frequency Regulation using Linear Active Disturbance Rejection Control Technique
*Authors: Anand Kumar, Md Nishat Anwar and Ranjeet Kumar*

15:00–15:15 Paper ID: 85
Title: Application of a Novel Political Optimization in Optimal Parameter Design of PI Controller for the BLDC motor Speed Control
*Authors: Ramesh Devarapalli, Naraharisetti Jaya Naga Lakshmi and Upendra Prasad*

15:15–15:30 Paper ID: 91
Title: Gain-Scheduled Feedback Controller Design for a Nonlinear Continuous Stirred Tank Reactor
*Authors: Ankita Ranjan, Sarbani Chakraborty and Vijaya Laxmi*

15:30–15:50 Paper ID: 102
Title: PID Control of a Fixed Displacement Electro-Hydrostatic Actuation System
*Authors: Nimai Pada Mandal*

**16:00-16:20 Valedictory Session**

# Energy Consumption and Energy Saving Potential in Indian Textile Sector

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***Abstract*—Energy is one of the major factors which are required for the development of any country. In our country India, the textile sector is one of the main consumer of energy among all industrial sectors. To conserve the energy in indian spinning textile industries; energy audit is performed which improve the energy efficiency with justified methodology and cost effective way. In this research study, the identified areas for energy conservation are- electricity bill analysis, power factor improvement, power quality analysis of supply mains, lighting system, ring frame three phase induction motors, compressed air system and rooftop solar PV system. A step-by-step procedure is also developed in this study for performing energy audit in an industry.**

***Index Terms*—Energy Audit, Indian Textile Sector, Electrical Energy Efficiency**

## I. Introduction

In India, textile sector plays very important role for employment generation. Presently, it is providing employment to a large number of country populations; which is second largest after agriculture. Indian textile sector is second in the world after china in terms of installed number of spindles (19.6%).Indian textile sector also support the economic development of country. Out of total industrial production, textile industry contribute about 14%. It also provide about 17% contribution in earnings from exports with 4% contribution in GDP. [1]

The energy requirements of textile industries are increasing day by day because of the two main reasons. First reason is the dusty and noisy environment of the mill, due to which the workers do not take interest in working with textile mills and the management is forced to use automated machinery to compensate the shortage of workers. These modern machines require more energy for their operation. Second reason is the inefficient operation of machinery in textile industry [2]. This high energy demand is increasing the concentration of green house gases, which create an adverse effect in environment.

The spinning textile mill mainly produces thread from cotton; where ring frame machine use maximum part (about 37%) of total electricity. Rest of the electricity is used by open end machines, blow room, carding, drawing, combing roving and winding [3].

The electrical energy consumption in various textile plants is investigated by Palamutcu [4] the deviation ratio between estimated and actual consumption of electrical energy is reported. The apparel production plant has very high deviation ratio. The cutting process of the jacket producing plant is the most energy intensive, where the per piece electrical energy requirement lies between (0.45 - 0.61) kWh [5].

In a Sri-Lanka based apparel plant, the major energy consumption is found in air conditioner (46%), which is followed by lighting system (20%) of the plant. The electrical energy saving (up to 10%) can be achieved by replacing the artificial lighting with day light in an apparel industry. Further the energy conservation can also be achieved by using- advance swing machine and steam condensate recovery etc [6], [7].

In a study, the electricity cost is found 65% of total energy cost of the system, which is reduced by 18% by efficient use of the transformers, cables, motor connections, power factor, peak savings and lighting system [8]. Total saving was found to be increased to 142.435 MWh/ year; if the building insulation, laptops/ computers, day lighting, use of steam in place of electrical energy, spindle change and use of solar system in place of conventional supply is considered [9]. Electricity saving of 312 MWh/ year total $CO_2$ reduction of 474.15 ton is found; if air conditioner, process control, compressor and boiler are also considered along with the conventional electrical systems for energy savings [10].

In another energy audit study, the energy saving of 23% in ventilation process followed by 22% in production process is obtained in a Sweden based industry [11].

Use of advanced power electronics based techniques in support to the existing electrical appliances reduces the requirement of energy for operation. Use of VSD with motors, which are operating with variable load, may reduce the energy consumption up to 30%. The optimization in complex pumping reduces the energy requirement upto 10%. Further the water conservation practices have also become the part of energy savings [12]–[14].

In this paper, the energy efficiency improvement experience of the authors with an indian textile industry is presented. The textile sector is considered for the study because of the two main reasons- i) in general practice, production based industries care for their production and energy conservation measures are avoided, ii) India has strong position of textile sector in world, hence energy savings not only support to eco-

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