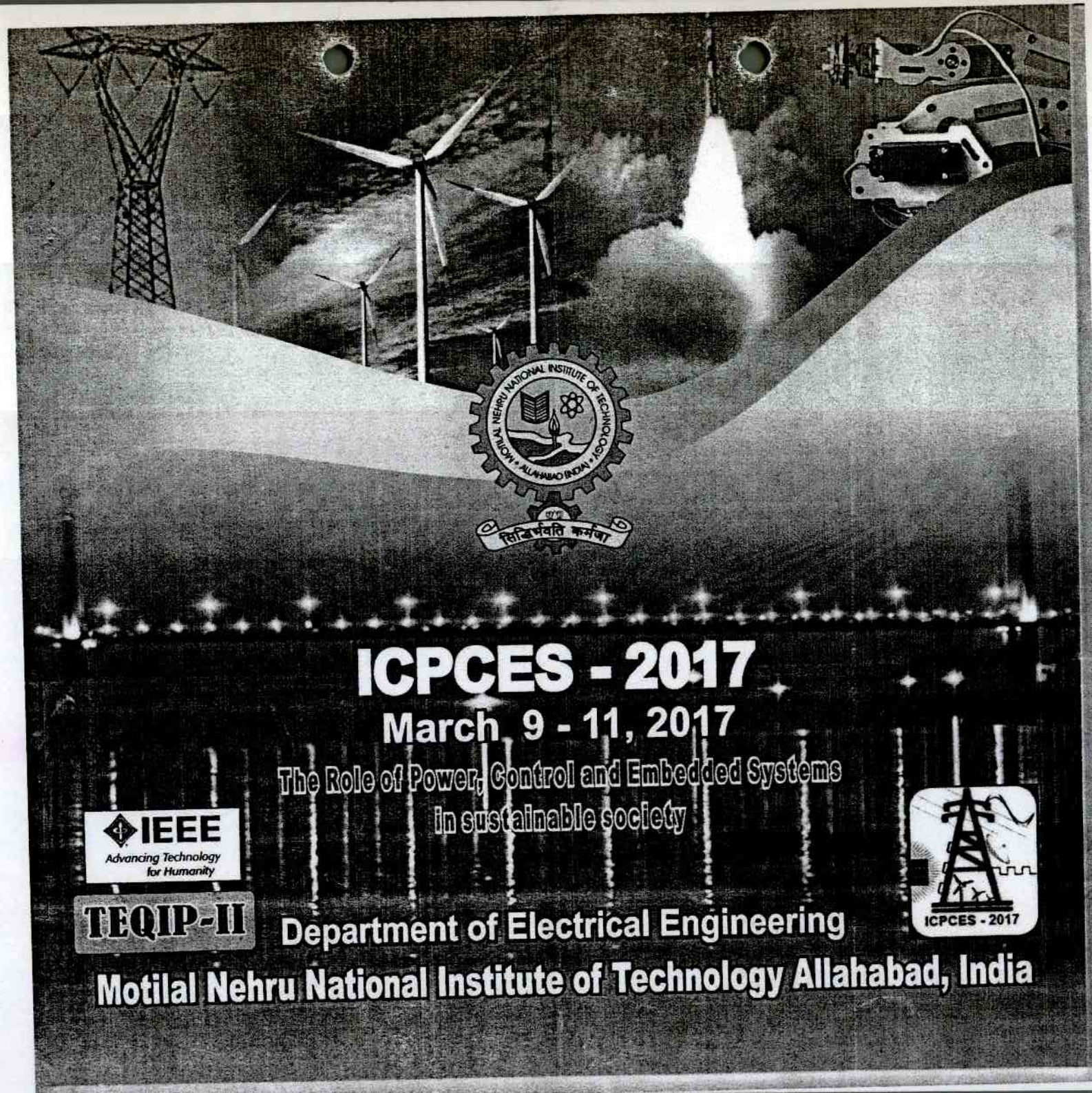
MOTILAL NEHRU NATIONAL INSTITUTE OF TECHNOLOGY
ALLAHABAD (INDIA)
सिद्धिर्भवति कर्मजा
ICPCES - 2017
March 9 - 11, 2017
The Role of Power, Control and Embedded Systems
in sustainable society
IEEE
Advancing Technology for Humanity
TEQIP-II
Department of Electrical Engineering
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Technical Paper Presentation Schedule

Session: **S 1** **Distributed Generation and its Network**
Session Chair: **Dr. Asim Datta,** **Mizoram University, Aizaawl, Mizoram,**
Date: 09 March 2017 **Day:** Thursday **Time:** 04:45 PM-06:30 PM
Venue: **Lecture Hall Complex 3**

S. No.	Paper ID	Author	Title
1	18	Srilakshmi. E, and S. P. Singh	Effect of Distributed Generation on Secondary Level Transmission System
2	61	Indrajit Koley, Partha Sarathee Bhowmik, and Asim Datta	Load Frequency Control in a Hybrid Thermal-Wind-Photovoltaic Power Generation System
3	115	Sarfaraz Nawaz, Ajay Kumar Bansal, Mahaveer Prasad Sharma, and Anjali Jain	A Novel Index and Hybrid Optimization Approach for Optimal Placement of Multiple DGs in Reconfigured Distribution Networks
4	116	Sarfaraz Nawaz, Anjali Jain, and Abhishek Gupta	A Novel Technique for Optimal Allocation of Capacitors in Radial Distribution System
5	122	Abhik Hazra, Saborni Das, Pallav Sarkar , Ashish Laddha, and Mousumi Basu	Optimal Allocation and Sizing of Multiple DG and Capacitor Banks considering Load Variations Using Water Cycle Algorithm

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Technical Paper Presentation Schedule

Session: S 2 **Controller Design Theory**
Session Chair: **Prof. H. N. Kar,** **MNNIT Allahabad**
Date: 09 March 2017 **Day:** Thursday **Time:** 04:45 PM-06:30 PM
Venue: **Lecture Hall Complex 7**

S. No.	Paper ID	Author	Title
1	59	Rimpi Devi, and Lillie Dewan	Comparative study of PID tuning methodologies for Industrial system and Haar wavelet based denoising
2	62	Rajiv Dey, Bharat Verma, Sachin K. Jain, and Prabin K. Padhy	Fast Adaptation Model Reference Adaptive Control
3	64	Sunil Kumar Singh, and Prabin Kumar Padhy	Design of PID Controller for Delayed Systems using Gain Margin and Phase Margin Criteria
4	87	Ankita Sharma, and Prabin Kumar Padhy	Design and implementation of PID controller for the decoupled two input two output control process
5	88	Ujjwal Manikya Nath, Chanchal Dey, and Rajani K. Mudi	Design of Modified Model-based Adaptive Control System for FOPDT Processes
6	108	Pooja Rani, and Haranath Kar	$l_2 - l_\infty$ Elimination of Overflow Oscillations in Interfered Digital Filters with Saturation Arithmetic
7	127	Reshma Sengupta, Ujjwal Manikya Nath, and Chanchal Dey	Design and Performance Analysis of a Modified MRAC for Second-order Processes

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Technical Paper Presentation Schedule

Session: S 3 VLSI-I
Session Chair: Dr. Manish Goswami, IIIT Allahabad
Date: 09 March 2017 **Day:** Thursday **Time:** 04:45 PM-06:30 PM
Venue: Lecture Hall Complex 2

S. No.	Paper ID	Author	Title
1	28	Nagamani A. N., Sharath Kumar S., and Vinod Kumar Agrawal	Design of Garbage Free Reversible Multiplier for Low Power Applications
2	95	Rupesh Shukla, and Santosh Kumar Gupta	Leakage Reduction in Ultra Deep Sub Micron Technology
3	112	Monika Yadav, Abhinav Gupta, and Sanjeev Rai	A Study and Comparative Analysis of Low Power Hybrid-CMOS 1-bit Full Adders in Deep-submicron Technology
4	114	Mitashra Gupta, and Ashutosh Nandi	Impact of Matched High-K Gate Dielectric based DG-MOSFET on SRAM performance
5	129	Pavankumar Bikki, and P. Karuppanan	Analysis of Low power Feedthrough Logic with Leakage Control Technique

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Technical Paper Presentation Schedule

Session: **S 4** **Image Processing and Soft Computing Applications**
Session Chair: **Dr. Shekhar Verma, IIIT Allahabad**
Date: 10 March 2017 **Day:** Friday **Time:** 04:00 PM-05:30 PM
Venue: **Lecture Hall Complex 3**

S. No.	Paper ID	Author	Title
1	16	Sahul M.P.V, Ankit Agarwal, Somasundaram. S, Gaurav Upadhyay, Thenmozhi Selvi.K, Sura P. S, and Subramanya Udupa	Architecture of Cost-effective, Advanced, High Data Rate Baseband Data Handling System and realization for High Resolution Remote Sensing Satellites
2	27	Gaurav Kataria, and Kailash Singh	RNN Based Soft Sensor for Estimation of Concentration for a Reactive Distillation Column
3	37	Suraj, Rakesh Kumar Sinha, and Subhojit Ghosh	Adaptive NFC for Classification of Two Class Motor Imagery Task
4	50	Naik Daksha, and Kelkar Rudraksha	Design and Testing of Self-tuned Fuzzy PI Controller for Improved Speed Control and Accelerating Torque Characteristics of a DC motor
5	100	Divya Srivastava, Surbhi Goel, and Suneeta Agarwal	Pipelined Technique for Image Retrieval Using Texture and Color
6	120	Manish Gupta, Shambhu Shankar Bharti, and Suneeta Agarwal	Implicit Language Identification System based on Random Forest and Support Vector Machine for Speech

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Technical Paper Presentation Schedule

Session: S 5 **Power Systems Dynamics and Protection**
Session Chair: **Dr. S. R. Mohanty, MNNIT Allahabad**
Date: 11 March 2017 **Day:** Saturday **Time:** 09:30 AM-11:00 AM
Venue: **Lecture Hall Complex 3**

S. No.	Paper ID	Author	Title
1	8	Om Hari Gupta, and Manoj Tripathy	jEC-Based Relaying Scheme for the Protection of Shunt-Compensated Transmission Line
2	11	Bhanu Pratap Soni, Akash Saxena, and Vikas Gupta	Online Identification of Coherent Generators in Power System by using SVM
3	32	Amulya, Mayur Patil, S. R. Bhide, and S. S. Bhat	Experimenting with IEC 61850 and GOOSE messaging
4	75	Ekta Purwar, D. N. Vishwakarma, and S. P. Singh	Planning A Comprehensive Protection Scheme Considering Distributed Generation
5	118	R. R. Ambekar, and H. A. Mangalvedekar	Power System State Estimation by Linear programming Under False Data Injection Attack
6	123	Subhendu Sekhar Sahoo, Anirban Mishra, Kalyan Chatterjee, and Chandan Kumar Sharma	Enhanced Fault Ride – Through Ability of DFIG-Based Wind Energy System Using Superconducting Fault Current Limiter

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Technical Paper Presentation Schedule

Session: S 6 **Power Components and its Control**
Session Chair: **Dr. Zakir H. Rather, IIT Bombay**
Date: 11 March 2017 **Day:** Saturday **Time:** 11:30 AM-01:00 PM
Venue: **Lecture Hall Complex 3**

S. No.	Paper ID	Author	Title
1	25	Sunil Kumar Mishra, and Aradhna Patel	Wells Turbine Modeling and PI Control Scheme for OWC Plant using Xilinx System Generator
2	70	Preeti Sonkar, and O. P. Rahi	Investigation on DFIG based wind turbine for short term frequency regulation techniques
3	124	Nitai Pal, Ashiwani Yadav, Shweta Rani, and Jagannath Patra	Voltage Profile Improvement in Off Grid Wind Turbine System using MGVC and Diesel Generator
4	125	Sonam Shrivastava, Bidyadhar Subudhi, and Susmita Das	Voltage and Frequency Synchronization of a Low Voltage Inverter based Microgrid
5	131	Kanika Chitnavis, and N. R. Bhasme	Review of Critical Analysis for Life Estimation of Power Transformer

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Technical Paper Presentation Schedule

Session: S 7 **VLSI Technology-II**
Session Chair: **Dr. Lokendra Kumar, Allahabad University**
Date: 11 March 2017 **Day:** Saturday **Time:** 11:30 AM-01:00 PM
Venue: **Lecture Hall Complex 7**

S. No.	Paper ID	Author	Title
1	19	Shanu Kumar, Vijaya Bhadauria and Tanmay Dubey	LVLP High Gm Bulk-driven Folded Cascode OTA using Current Shunt Auxiliary Pair
2	44	Amrish Kumar, Abhinav Gupta, and Sanjeev Rai	Charge Plasma Based Graded Channel With Dual Material Double Gate JLT For Enhance Analog/RF Performance
3	45	Anjali Priya, Sanjeev Rai, and Ram Awadh Mishra	Comparative Analysis of Junctionless Bulk and SOI/SON FinFET
4	46	Rachana Chauhan, Abhinav, Amrish Kumar, and Sanjeev Rai	A Comparative study of Junctionless dual material double gate Silicon on Insulator (SOI) and Silicon on Nothing (SON) MOSFET
5	47	Abhinav Gupta, Neha Maurya, and Sanjeev Rai	Impact of dielectric pocket on analog/RF performance of short channel double gate MOSFET

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Technical Paper Presentation Schedule

Session: **S 8** **Controller for Engineering Applications**
Session Chair: **Prof. Shubhi Purwar, MNNIT Allahabad**
Date: 11 March 2017 **Day:** Saturday **Time:** 11:30 AM-01:00 PM
Venue: **Lecture Hall Complex 2**

S. No.	Paper ID	Author	Title
1	60	Tamen Thapa Sarkar, and Lillie Dewan	Application of LQR and MRAC for swing up control of Inverted Pendulum
2	74	Varun Dourla, Sandeep Pandey, and Anjali S. Junghare	Design and Analysis of Dynamic Sliding Mode Control for Magnetic Levitation System
3	110	Arvind Katyayn, and Praveen Kumar Agarwal	Type-2 Fuzzy Logic Controller for Conical AMB-Rotor system
4	111	Avadh Pati,Vipin Chandra Pal, and Vijay Kumar Verma	Model Reference based Adaptive Sliding Mode Control of Magnetic Levitation System
5	113	Yograj Sharma, and Jyoti Ohri	LabVIEW based Linear Quadratic Regulator and Model Predictive Controller for DC Motor and Flexible Link Manipulator
6	121	Sai Sandeep Damera, Bhavana Rana, and Amit Dhurwey	U-model based design procedure for non-linear control systems: A generic approach

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Technical Paper Presentation Schedule

Session: **S 9** **Instrumentation & its Network for Monitoring**
Session Chair: **Prof. V. K. Srivastava, MNNIT Allahabad**
Date: 11 March 2017 **Day:** Saturday **Time:** 02:00 PM-03:30 PM
Venue: **Lecture Hall Complex 2**

S. No.	Paper ID	Author	Title
1	42	Vipin Prakash Yadav, Alakh Sinha, and Arun Khosla	Design and Implementation of Ultrasonic Anemometer
2	73	Baiju Payyappilly, and Sankaran M	Design framework of a Configurable Electrical Power System for Lunar Rover
3	79	Jyoti Kashniyal, Shekhar Verma, and Krishna Pratap Singh	Performance Analysis of Localization Methods for Wireless Sensor Networks
4	106	Tarique Rashid, Sunil Kumar, and Arvind Kumar	Effect of Body Node Coordinator (BNC) Positions on the Performance of Intra-Body Sensor Network (Intra-WBSN)

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Technical Paper Presentation Schedule

Session: S 10 **Power Electronics & Drive Applications**
Session Chair: **Dr. Rajesh Gupta, MNNIT Allahabad**
Date: 11 March 2017 **Day:** Saturday **Time:** 02:00 PM-03:30 PM
Venue: **Lecture Hall Complex 7**

S. No.	Paper ID	Author	Title
1	34	Umesh Kumar Soni, and Ramesh Kumar Tripathi	Two Phase Bipolar and Two Phase Split Unipolar Operation of PMSM with Multiconfiguration Stator Using LABVIEW
2	49	Sourabh Kundu, Santu Kumar Giri, Sarbani Mukherjee, and Subrata Banerjee	Performance Analysis of Three-Phase Five-Level NPC Inverter by Using Triangular and Trapezoidal Triangular Carrier-based Modulation Techniques
3	56	A. Kumar,D. Chatterjee, and A. Dasgupta	Harmonic Mitigation of Cascaded Multilevel Inverter with Non Equal DC Sources Using Hybrid Newton Raphson Method
4	133	G. Indira Kishore, Maloth Naresh and Ramesh Kumar Tripathi	Modified Multiplier SEPIC Converter for High Voltage DC Applications
5	134	G Indira Kishore, and Ramesh Kumar Tripathi	A Novel High Voltage Gain Single-Phase AC-DC PFC Converter using Switched-Capacitor

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Technical Paper Presentation Schedule

Session: S 11 **Power Electronics in Power Systems Applications**
Session Chair: **Dr. Manoj Tripathy, IIT Roorkee**
Date: 11 March 2017 **Day:** Saturday **Time:** 02:00 PM-03:30 PM
Venue: **Lecture Hall Complex 3**

S. No.	Paper ID	Author	Title
1	40	Brij Sunder Joshi, Om Prakash Mahela, and Sheesh Ram Ola	Implementation of Thyristor Controlled Series Capacitor in Transmission System to Improve the Performance of Power System Network
2	54	Sakshi Mishra, Subhojit Ghosh, Arup Goswami	A Genetic Algorithm Tuned Kalman Filter for Estimating Harmonic and Inter-Harmonic Attributes
3	85	Tripurari Das Gupta, Deepak Kumar, and Kalpana Chaudhary	Modelling and Analysis of Grid-tied Fuel Cell System with Synchronous Reference Frame Control
4	94	Saurabh Kumar, Rajat Kumar, and Navdeep Singh	Performance of Closed Loop SEPIC Converter with DC-DC Converter for Solar Energy System
5	96	Rajat Kumar, Saurabh Kumar, Navdeep Singh, and Vineeta Agrawal	SEPIC Converter with 3-Level NPC Multi-Level Inverter for Wind Energy System (WES)
6	102	Anju Bala, Geeta Thakur, and Lini Mathew	Design and Implementation of Three Phase Three Level Inverter Based DSTATCOM
7	132	Rajnish Bhasker, and Vineeta Agarwal	Modeling of Modular Multilevel Converter for Grid Application

EE-09

Online Identification of Coherent Generators in Power System by using SVM

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***Abstract*—With the deregulation of the electrical power system and competitive business environment, power system monitoring and control have been emerged as a potential research area. Operation and control of power system are based on several strategies under normal, critical and emergency states of a power system. Control actions can be initiated either at load end (load shedding) or at generator end (generation rescheduling). Both of these actions required the knowledge of the swing of the generators at different operating/contingency conditions. This paper presents an application of supervised learning model to detect coherent machines in a large power network. A method to find the real-time transient stability state and identification of the coherent generator groups by predicting the rotor angle values following a large disturbance through Support Vector Machines (SVMs) is proposed in this work. The proposed method enables to determine synchronism state of the individual machine in real-time. The validity of proposed method is investigated on IEEE-39 bus test system.**

Keywords—Coherent Group, Transient Stability, Critical Line Outage, Power System Stability, Static Security Assessment, Coherency, Vulnerable Generators, Support Vector Machines (SVMs).

Nomenclature:

δ_{COI} : centre of inertia
M_i : inertiaof generator i
δ_i : rotor angleof generator i
$\delta_{\max}$: maximum value of δ_i for stable case

I. INTRODUCTION

Successful operation and control of power system are based on the control actions and intelligent decision making.Control actions can be divided into two categories namely corrective control and preventive control. Corrective control actions are initiated by the system operator when a critical contingency is earlier detected and the sufficient time is available for applying these strategies. These strategies are applied on the generation side. Preventive control strategies are those, which are applied to protect the system stability in less time hence these are considered as emergency control actions. Emergency control actions are applied on the demand side. Generator rescheduling and load shedding are two strategies for operation and control of the power system. To decide the potential candidates (generators, loads) for rescheduling and shedding, the system operator requires information about the behaviour of the generator in different operating and contingency conditions.Power system dynamics is the study of the behaviour of the generator's swing after the power network is subjected to a disturbance. Control strategies are initiated and applied to the generators which are coherent. After a disturbance, generator rotors exhibits swing to obtain new operating equilibrium. The machines which show similar behaviour (power angle variation) are known as coherent machines. Determination of coherency is an important aspect of decision making of load shedding and generator rescheduling. Literature review indicates that a lot of research has been carried out by the researchers. Application of ANN is reported most in the studies due to the capability of solving nonlinear mapping problems [1-3]. Divergence-based security evaluation is proposed by authors [3]. A coherency based generator rescheduling is presented in the approach [4].

A geometric theory of linear system has been employed to detect coherency and near coherency for a generator group for multiple disturbances in [5].A Taylor series expansion of rotor angle has been employed in [6] to identify coherent group. The approach has been tested over five power systems. The major pitfall of this approach was the measurements of rotor angles at three stages in early transient state and a degree of coupling was required between the generators. Graph modelling approach has been employed to identify coherent machines on IEEE-39 and IEEE -118 bus test systems [7].Non generating buses were assigned to the coherent groups on the basis of distance of the bus from the generator group, topology and operational constraints. Integration of solar PV cells, fuel cells, and wind energy systems were considered. Angle Modulated Particle Swarm Optimization (AMPSO) and slow coherency algorithm applied for thedetermination of similar machines for the islanding detection [8]. An index based approach has been employed to judge electro mechanical oscillations [9]. An Independent Component Analysis (ICA) has been employed in [10] to choose potential inputs from generator speed and bus angle data. The approach was able to identify coherent groups after the disturbance.

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