## 2019 20th International **Conference on Intelligent System Application to Power Systems** (ISAP 2019)

New Delhi, India 10 – 14 December 2019



**IEEE Catalog Number: CFP19755-POD ISBN**:

978-1-7281-3193-1

### Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP19755-POD

 ISBN (Print-On-Demand):
 978-1-7281-3193-1

 ISBN (Online):
 978-1-7281-3192-4

#### **Additional Copies of This Publication Are Available From:**

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-040

Phone: (845) 758-0400 Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



# 2019 20th International Conference on Intelligent System Application to Power Systems (ISAP)

Intelligent systems technique to operation, planning and optimization in power

Detailed Evaluation of Long-term Gamified Residential Demand Management System Field	
Negar Dashti (Istanbul Technical University, Turkey), Alparslan Zehir (Istanbul Technical University, Turkey), Hakan Gul (Istanbul Technical University, Turkey), Alp Batman (Istanbul Technical University, Turkey), Mustafa Bagriyanik (Istanbul Technical University, Turkey), Unal Kucuk (MAKEL, Turkey), Filipe Soares (INESC TEC, Portugal), Aydogan Ozdemir (Istanbul Technical University, Turkey)	1
Achieving Zero Steady State Error on Voltage Source Inverters with Sinusoidal References Using a RST Polynomial Controller	
Wilson Santana (Instituto Gnarus, Brazil), Camila Salomon (Universidade Federal de Itajuba, Brazil), Germano Lambert-Torres (Gnarus Institute, Brazil), Erik Bonaldi (Instituto Gnarus, Brazil), Carlos Eduardo Teixeira (Federal University of Itajuba, Brazil), Mateus Campos (Universidade Federal de Itajuba, Brazil), Bruno Gama (Universidade Federal de Itajuba, Brazil), Luiz Eduardo Borges da Silva (Universidade Federal de Itajubá, Brazil), Rafael Carvalho (EDF Norte Fluminense, Brazil)	7
Sizing and Operation Optimization for Renewable Energy Facilities with Demand Response in Micro-grid	
Makoto Sugimura (University of the Ryukyus, Japan), Tomonobu Senjyu (Faculty of Engneering, University of the Ryukyus, Japan), Narayanan K (SASTRA Deemed University & School of Electrical and Electronics Engineering, India), Paras Mandal (University of Texas at El Paso, USA), Mamdouh Abdel-Akher (Aswan University & Faculty of Engineering, Egypt), Ashraf Hemeida (Faculty of Energy Engineering & Aswan University,	. 13
A Multi-Objective Genetic Algorithm Approach for Synergetic Source-Storage-Load Dispatch in a Residential Microgrid	
Subho Paul (Indian Institute of Technology Roorkee, India), Narayan Padhy (Indian Institute of Technology Roorkee, India)	18
Data Derived Identification Methodology for Online Estimation of Parameters of Induction Machine	
Rashmi Prasad (Indian Institute of Technology Roorkee, India), Narayan Padhy (IIT Roorkee, India)	. 25
ent systems technique to data handling and smart learning	in
Detection of Boiler Tube Leakage Fault in a Thermal Power Plant Using K-means Algorithm Based on Auto-Associative Neural Network	
Kyuhan Kim (Pusan National University, Korea (South)), Heungseok Lee (Pusan National University, Korea (South)), Junghwan Kim (Pusan National University, Korea (South)), JuneHo Park (Pusan National University, Korea (South))	. 32
	Implementation  Negar Dashti (Istanbul Technical University, Turkey), Alparslan Zehir (Istanbul Technical University, Turkey), Hakan Gul (Istanbul Technical University, Turkey), Hakan Gul (Istanbul Technical University, Turkey), Mustafa Bagriyanik (Istanbul Technical University, Turkey), Unal Kucuk (MAKEL, Turkey), Flipe Soares (INESC TEC, Portugal), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Achieving Zero Steady State Error on Voltage Source Inverters with Sinusoidal References Using a RST Polynomial Controller  Wilson Santana (Instituto Gnarus, Brazil), Camila Salomon (Universidade Federal de Itajuba, Brazil), Erik Bonaldi (Instituto Gnarus, Brazil), Carlos Eduardo Teixeira (Federal University of Itajuba, Brazil), Mateus Campos (Universidade Federal de Itajuba, Brazil), Rafael Carvalho (EDF Norte Fluminense, Brazil)  Rafael Carvalho (EDF Norte Fluminense, Brazil)  Sizing and Operation Optimization for Renewable Energy Facilities with Demand Response in Micro-grid  Makoto Sugimura (University of the Ryukyus, Japan), Tomonobu Senjyu (Faculty of Engneering, University of the Ryukyus, Japan), Narayanan K (SASTRA Deemed University & School of Electrical and Electronics Engineering, India), Paras Mandal (University of Texas at El Paso, USA), Mamdouh Abdel-Akher (Aswan University & Faculty of Engineering, Egypt), Ashraf Hemeida (Faculty of Energy Engineering & Aswan University, Aswan, Egypt)  A Multi-Objective Genetic Algorithm Approach for Synergetic Source-Storage-Load Dispatch in a Residential Microgrid  Subho Paul (Indian Institute of Technology Roorkee, India), Narayan Padhy (Indian Institute of Technology Roorkee, Indian), N

A New Simulated Database for Classification Comparison in Power Signature Analysis	
Hellen Cristina Ancelmo (Universidade Tecnologica Federal do Parana - UTFPR - Campu Curitiba, Brazil), Bruna Mulinari (UTFPR, Brazil), Fabiana Pottker (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Elder Oroski (UTFPR, Brazil), Thiago Bazzo (UTFPR, Brazil), Douglas Renaux (UTFPR, Brazil), Carlos Raimundo Lima (UFTPR, Brazil), Robsor Linhares (UTFPR, Brazil), Adriano Gamba (UTFPR, Brazil)	
Defining the Optimal Number of Demand Response Programs and Tariffs Using Clustering Methods	
Catia Silva (Polytechnic Institute of Porto, Portugal), Pedro Faria (Polytechnic Institute of Porto, Portugal), Zita Vale (Polytechnic Institute of Porto, Portugal)	of 44
Multi-agent Semantic Interoperability in Complex Energy Systems Simulation and Decision Support	1
Gabriel Santos (Polytechnic of Porto, Portugal), Tiago Pinto (Polytechnic of Porto, Portugal), Zita Vale (Polytechnic Institute of Porto, Portugal), Juan Corchado (Universid de Salamaca, Spain)	ad 50
Adaptive Neuro Fuzzy Inference System for Cyber-Intrusion Detection in a Smart Grid	
Juan Bedoya (VirginiaTech, USA), Chen-Ching Liu (Virginia Tech, USA), Jing Xie (Seattle Research Center, Pacific Northwest National Laboratory, USA)	56
Development of Preconditioned Deep Neural Network for Electricity Price Forecasting	63
Kodai Yamada (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)  Forecasting Power Consumption of IT Devices in a Data Center	62
Mehmet Türker Takci (Gebze Technical University, Turkey), Tuba Gözel (Gebze Technic	
University, Turkey), Mehmet Hocaoğlu (Gebze Technical University, Turkey)	68
igent systems technique to computational application in  Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)	power
igent systems technique to computational application in  Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)  A Framework for Cyber-Physical Model Creation and Evaluation	power
igent systems technique to computational application in  Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)  A Framework for Cyber-Physical Model Creation and Evaluation  Abhijeet Sahu (Texas A&M University, USA), Hao Huang (Texas A&M University, USA), Katherine Davis (Texas A&M University, USA), Saman Zonouz (Rutgers University, USA)	power 76
igent systems technique to computational application in  Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)  A Framework for Cyber-Physical Model Creation and Evaluation Abhijeet Sahu (Texas A&M University, USA), Hao Huang (Texas A&M University, USA), Katherine Davis (Texas A&M University, USA), Saman Zonouz (Rutgers University, USA) A Transient and Steady-State Power Signature Feature Extraction Using Different Prony's Methods	power 76
igent systems technique to computational application in  Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)  A Framework for Cyber-Physical Model Creation and Evaluation  Abhijeet Sahu (Texas A&M University, USA), Hao Huang (Texas A&M University, USA), Katherine Davis (Texas A&M University, USA), Saman Zonouz (Rutgers University, USA)  A Transient and Steady-State Power Signature Feature Extraction Using Different Prony's	power 76 82
igent systems technique to computational application in  Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)  A Framework for Cyber-Physical Model Creation and Evaluation  Abhijeet Sahu (Texas A&M University, USA), Hao Huang (Texas A&M University, USA), Katherine Davis (Texas A&M University, USA), Saman Zonouz (Rutgers University, USA), A Transient and Steady-State Power Signature Feature Extraction Using Different Prony's Methods  Hellen Cristina Ancelmo (Universidade Tecnologica Federal do Parana - UTFPR - Campu Curitiba, Brazil), Flavio Grando (UTFPR, Brazil), Bruna Mulinari (UTFPR, Brazil), Clayton Hilgemberg da Costa (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Elder Oroski (UTFPR, Brazil), Douglas Renaux (UTFPR, Brazil), Fabiana Pottker (UTFPR, Brazi	power 76
Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)  A Framework for Cyber-Physical Model Creation and Evaluation Abhijeet Sahu (Texas A&M University, USA), Hao Huang (Texas A&M University, USA), Katherine Davis (Texas A&M University, USA), Saman Zonouz (Rutgers University, USA), A Transient and Steady-State Power Signature Feature Extraction Using Different Prony's Methods  Hellen Cristina Ancelmo (Universidade Tecnologica Federal do Parana - UTFPR - Campu Curitiba, Brazil), Flavio Grando (UTFPR, Brazil), Bruna Mulinari (UTFPR, Brazil), Clayton Hilgemberg da Costa (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Elder Oroski (UTFPR, Brazil), Douglas Renaux (UTFPR, Brazil), Fabiana Pottker (UTFPR, Brazil Carlos Raimundo Lima (UFTPR, Brazil), Robson Linhares (UTFPR, Brazil)  Bi-Level Optimization Problem to Develop Optimal Strategy of a Generator in Competitive Environment Arvind Kumar Jain (National Institute of Technology Agartala, India)	power 76
igent systems technique to computational application in  Fault Classification in Power Distribution Systems Using PMU Data and Machine Learning Flavio Grando (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Miguel Moreto (UFSC, Brazil), Heitor Silverio Lopes (UTFPR, Brazil)  A Framework for Cyber-Physical Model Creation and Evaluation  Abhijeet Sahu (Texas A&M University, USA), Hao Huang (Texas A&M University, USA), Katherine Davis (Texas A&M University, USA), Saman Zonouz (Rutgers University, USA), Katherine Davis (Texas A&M University, USA), Saman Zonouz (Rutgers University, USA), A Transient and Steady-State Power Signature Feature Extraction Using Different Prony's Methods  Hellen Cristina Ancelmo (Universidade Tecnologica Federal do Parana - UTFPR - Campu Curitiba, Brazil), Flavio Grando (UTFPR, Brazil), Bruna Mulinari (UTFPR, Brazil), Clayton Hilgemberg da Costa (UTFPR, Brazil), Andre Eugenio Lazzaretti (UTFPR, Brazil), Elder Oroski (UTFPR, Brazil), Douglas Renaux (UTFPR, Brazil), Fabiana Pottker (UTFPR, Brazil Carlos Raimundo Lima (UFTPR, Brazil), Robson Linhares (UTFPR, Brazil)  Bi-Level Optimization Problem to Develop Optimal Strategy of a Generator in Competitive Environment	power 76 82 s

Co-optimizing Energy Storage for Prosumers Using Convex Relaxations  Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France), Deepjyoti Deka (Los Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITI / LARSyS & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA)  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization  Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)  Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems  Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Time Series Representation Learning Applications for Power Analytics	
Intelligent systems technique to operation, planning and optimization in power  Hybrid Intelligence Techniques for Unit Commitment of Microgrids Bishwajit Dey (Indian Institute of Technology Indian School of Mines Dhanbad, India), Biplab Bhattacharyya (Indian Institute of Technology Dhanbad, India)  Co-optimizing Energy Storage for Prosumers Using Convex Relaxations Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France), Deepjyoti Deka (Los Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITII / LARSys & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA)  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)  125 Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (ITT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)	University Belfast, United Kingdom (Great Britain)), Sahely Bhadra (Indian Institute	e of
Intelligent systems technique to operation, planning and optimization in power  Hybrid Intelligence Techniques for Unit Commitment of Microgrids Bishwajit Dey (Indian Institute of Technology Indian School of Mines Dhanbad, India), Biplab Bhattacharyya (Indian Institute of Technology Dhanbad, India)  Co-optimizing Energy Storage for Prosumers Using Convex Relaxations  Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France), Deepjyoti Deka (Los Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITI / LARSyS & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA)  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)  125 Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  148 Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Kiprakis (University of Edinburgh, United Kingdom (Great Britain)), S n Singh (IIT	Kanpur,
Hybrid Intelligence Techniques for Unit Commitment of Microgrids Bishwajit Dey (Indian Institute of Technology Indian School of Mines Dhanbad, India), Biplab Bhattacharyya (Indian Institute of Technology Dhanbad, India)  Co-optimizing Energy Storage for Prosumers Using Convex Relaxations Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France), Deepjyoti Deka (Los Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITI / LARSyS & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA)  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)  Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India) Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India) Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan) Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	India)	107
Hybrid Intelligence Techniques for Unit Commitment of Microgrids Bishwajit Dey (Indian Institute of Technology Indian School of Mines Dhanbad, India), Biplab Bhattacharyya (Indian Institute of Technology Dhanbad, India)  Co-optimizing Energy Storage for Prosumers Using Convex Relaxations Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France), Deepjyoti Deka (Los Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITI / LARSyS & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA)  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)  Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India) Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India) Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan) Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		
Bishwajit Dey (Indian Institute of Technology Indian School of Mines Dhanbad, India), Biplab Bhattacharyya (Indian Institute of Technology Dhanbad, India)		ptimization
Biplab Bhattacharyya (Indian Institute of Technology Dhanbad, India)  Co-optimizing Energy Storage for Prosumers Using Convex Relaxations  Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France), Deepjyoti Deka (Los Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITI / LARSyS & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA)  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization  Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)  Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems  Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan), Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Hybrid Intelligence Techniques for Unit Commitment of Microgrids	
Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France), Deepjyoti Deka (Los Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITI / LARSyS & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA) 118  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan) 125  Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems  Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey) 131  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India) 137  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India) 143  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan) 48  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		dia), 112
Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira (M-ITI / LARSyS & Prsma.com, Portugal), Scott Backhaus (Los Alamos National Laboratory, USA) 118  A Hierarchical Scheme for Voltage and Reactive Power Control with Predator-Prey Brain Storm Optimization Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan) 125  Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems  Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey) 131  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India) 137  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India) 143  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Co-optimizing Energy Storage for Prosumers Using Convex Relaxations	
Storm Optimization Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan) Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India) Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  148 Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Alamos National Laboratory, USA), Ana Busic (INRIA / ENS, France), Lucas Pereira	n (M-ITI
Optimal Allocation of Multi-Type Distributed Generators for Minimization of Power Losses in Distribution Systems  Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	, and the second se	ain
Bahman Ahmadi (Istanbul Technical University, Turkey), Oguzhan Ceylan (Kadir Has University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Shota Ogawa (Meiji University, Japan), Hiroyuki Mori (Meiji University, Japan)	125
University, Turkey), Aydogan Ozdemir (Istanbul Technical University, Turkey)  Intelligent systems technique to protection and control in power  Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan)  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		sses in
Boost Power Factor Correction Converter Fed Domestic Induction Heating System  Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan)  Takaharu Takeshita (Nagoya Institute of Technology, Japan)  148  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		as 131
Anand Kumar (IIT (ISM), Dhanbad, India), Debayan Sarkar (IIT (ISM) Dhanbad, India), Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India) 137  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India) 143  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  148  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Intelligent systems technique to protection and control in	power
Prdip Kumar Sadhu (IIT (ISM), Dhanbad, India)  Islanding Detection in a Distribution System: A Pattern Assessment Based Approach Using Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan)  Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	- ,	
Concordia Analysis  Soham Dutta (Indian Institute of Technology (ISM), Dhanbad, India), Shailesh Verma (Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  148  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		ndia), 137
(Indian Institute of Technology (ISM), Dhanbad, India)  Optimal Coordination of Directional Overcurrent Relays Considering a Modified Objective Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  148  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		Using
Function Using Genetic Algorithm  Enos Bright Masereka (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  Japan)  148  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		
Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)  148  Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning		tive
Predictive Maintenance of Air Conditioning Systems Using Supervised Machine Learning	Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology	ogy,
Shrishti Trivedi (Netaji Subhas University of Technology, India), Sahil Bhola (Netaji Subhas	Shrishti Trivedi (Netaji Subhas University of Technology, India), Sahil Bhola (Netaji	i Subhas
University of Technology & Delhi University, India), Archit Talegaonkar (Netaji Subhas University of Technology, India), Shreya Sharma (Indraprastha Institute of Information Technology, India), Prerna Gaur (Netaji Subhas University of Technology & IEEE DELHI	University of Technology, India), Shreya Sharma (Indraprastha Institute of Information	ation
		154

	A Study of Distribution System Self-Healing Considering Intelligent Approaches  Bruno Torres (Universidade Federal de Itajuba, Brazil), Luiz Eduardo Borges da Silva (Universidade Federal de Itajubá, Brazil), Camila Salomon (Universidade Federal de Itajuba, Brazil), Alexandre Rasi Aoki (Universidade Federal do Paraná, Brazil), Lucas Ferreira (Siemens, Brazil), Germano Lambert-Torres (Gnarus Institute, Brazil), Joselino Santana Filho (EDP Sao Paulo, Brazil)	160
	Design and Tuning of Multi-Band Based Power System Stabilizer and Implementation in HYPERSIM	
	Ajit Kumar (OPAL-RT India, India), Amine Bahjaoui (Opal-RT, Canada), Shravana Kumar Musunuri (Opal-RT Technologies India Pvt Ltd, India), Biswajeet Rout (OPAL-RT Technologies, India)	168
	On the Parametric Dependence of the Stability of a Current Controlled Grid Tied Inverter	
	Arpan Malkhandi (IIT Delhi, India), Nilanjan Senroy (Indian Institute of Technology, India), Sukumar Mishra (Indian Institute of Technology, India)	174
Intelli	gent systems technique to computational application in pow	er
	Revisit Neural Network Based Load Forecasting	
	Yingshan Tao (Guangdong University of Technology, China), Fei Zhao (Guangdong University of Technology, China), Haoliang Yuan (Guangdong University of Technology, China), Chun Sing Lai (Guangdong University of Technology & University of Leeds, China), Zhao Xu (Hong Kong Polytechnic University & Technical University of Denmark, Hong Kong), Wing Ng (South China University of Technology, China), Rongwei Li (Guangdong University of Technology, China), Xuecong Li (Guangdong University of Technology,	
	China), Loi Lei Lai (Guangdong University of Technology, China)  Recognition of Fault Location and Type in a Medium Voltage System with Distributed  Generation Using Machine Learning Approach	179
	Adhishree Srivastava (IIT Patna, India), Sanjoy Kumar Parida (Iit Patna, India)  **Resonance Investigation of Grid Connected DFIG System**	184
	Melaku Matewos Hailemariam (India & IIT Delhi, India), Nilanjan Senroy (Indian Institute of Technology, India)	191
	Optimal Selection of Input Variables by BPSO for Diagnosis of Incipient Failures in Power Transformers (by DGA)	
	Shigeaki Leite de Lima (Federal University of Maranhao, Brazil), Alex R Soto Enriquez (Universidade Federal do Maranhão, Brazil), Osvaldo R Saavedra (Federal University of Maranhao, Brazil)	199
	K-NN and Mean-Shift Algorithm Applied in Fault Diagnosis in Power Transformers by DGA	
	Shigeaki Leite de Lima (Federal University of Maranhao, Brazil), Alex R Soto Enriquez	
	(Universidade Federal do Maranhão, Brazil), Osvaldo R Saavedra (Federal University of Maranhao, Brazil)	205

# Intelligent systems technique to operation, planning and optimization in power

Fast Generation Redispatch Techniques for Automated Remedial Action Schemes	
Hao Huang (Texas A&M University, USA), Maryam Kazerooni (University of Illinois at Urbana-Champaign, USA), Shamina Hossain-McKenzie (Sandia National Laboratories, USA), Sriharsha Etigowni (Rutgers University, USA), Saman Zonouz (Rutgers University,	
USA), Katherine Davis (Texas A&M University, USA)	211
A Novel I-PDF Controller for LFC with AC/DC Tie-line	
Abhineet Prakash (Indian Institute of Technology, Patna, India, India), Kundan Kumar (Indian Institute of Technology, Patna, India), Sanjoy Kumar Parida (Indian Institute of Technology, Patna, India, India)	219
Load Frequency Control Scheme Using Inertia Emulation Controlled HVDC Tie-Line	
Sariki Murali (National Institute of Technology Patna, India), Ravi Shankar (National Institute of Technology Patna, India)	225
Optimized First-order S-To-Z Mapping Function for IIR Filter Designing	
Shalabh Kumar Mishra (NSIT, University of Delhi & Atria Institute of Technology, Bengaluru, India), Dharmendra Kumar Upadhyay (University of Delhi, India), Maneesha Gupta (Netaji Subhas Institute of Technolgy & University of Delhi, India)	232
Intelligent systems technique to operation, planning and optimination of the power	zation
in porto.	
Voltage Control Using Smart Transformer for Increasing Photovoltaic Penetration in a Distribution Grid	
Manojkumar Rampelli (Indian Institute of Technology Guwahati, India), Hrishikesan VM (Indian Institute of Technology Guwahati, India), Chandan Kumar (Indian Institute of Technology Guwahati, India), Sanjib Ganguly (IIT Guwahati, India)	237
Fractional Order PI Control of Dual Active Bridge Converter Using Generalized Average Modelling	
Shipra Tiwari (National Institute of Technology, India), Omar Hanif (The University of Manchester, India & Manchester, United Kingdom (Great Britain)), Saumendra Sarangi (Srinagar, Pauri (Garhwal) & NIT Uttarakhand, India)	244
Operation of Distribution Network with Distributed Generation in Floating Mode	Z T T
Sangeeta Das (Veermata Jijabai Technological Institute, India), Debapriya Das (IIT	
Kharagpur, India), Amit Patra (IIT Kharagpur, India)	251
A Contract-based Trading Model for Electricity Suppliers in Smart Grids	
Uzma Amin (Macquarie University Australia, Pakistan), Md Jahangir Hossain (Macquarie University, Australia), Khizir Mahmud (Northwestern Polytechnical University, China)	258
Parameters Extraction of a Photovoltaic Cell Model Using a Co-evolutionary Heterogeneous Hybrid Algorithm	
Md Jahangir Hossain (Macquarie University, Australia), Altaf Badar (National Institute of Technology, Warangal, India)	263

Intelligent systems technique to computational application in pow	er
Optimal Bidding in Local Energy Markets Using Evolutionary Computation  João Soares (Polytechnic Institute of Porto & GECAD - Knowledge Engineering and Decision Support Research Center, Portugal), Fernando Lezama (Polytechnic of Porto &	
GECAD, Portugal), Zita Vale (Polytechnic Institute of Porto, Portugal)	269
Estimating Breaker Status with Electrical State Images and Convolutional Neural Networks  Vladimiro Miranda (INESC TEC and University of Porto, Portugal), Luis Teixeira (INESC	
TEC, Portugal), Jorge Pereira (INESC TEC and University of Porto, Portugal)  EPSO Enhanced by Adaptive Scaling and Sub-Swarms	275
Vladimiro Miranda (INESC TEC and University of Porto, Portugal), Joao Vigo (INESC TEC, Portugal), Leonel Carvalho (INESC TEC, Portugal), Carolina Marcelino (UFRJ, Brazil),	
Elizabeth Wanner (CEFET-MG, Brazil)	280
Mahsa Khorram (Polytechnic Institute of Porto, Portugal), Pedro Faria (Polytechnic Institute of Porto, Portugal), Omid Abrishambaf (Polytechnic of Porto, Portugal), Zita Vale (Polytechnic Institute of Porto, Portugal), João Soares (Polytechnic Institute of Porto &	
GECAD - Knowledge Engineering and Decision Support Research Center, Portugal)	286
Differential Evolution Optimization for a Residential Demand Response Application Ricardo Faia (Polytechnic Institute of Porto, Portugal), Fernando Lezama (Polytechnic Institute of Porto, Portugal), Pedro Faria (Polytechnic Institute of Porto, Portugal), Zita	
Vale (Polytechnic Institute of Porto, Portugal)	292
Air Conditioning Consumption Optimization Based on CO2 Concentration Level  Mahsa Khorram (Polytechnic Institute of Porto, Portugal), Modar Zheiry (Polytechnic Institute of Porto, Portugal), Pedro Faria (Polytechnic Institute of Porto, Portugal), Zita	
Vale (Polytechnic Institute of Porto, Portugal)	298
Intelligent systems technique to operation, planning and optimizatin power	tion
Normalized Kinetic Energy Based Generation Reshuffling to Improve Dynamic Security Constrained Optimal Power Flow	
Rajiv Jha (IIT Delhi, India), Kush Khanna (IIT DELHI, India), Bijaya Ketan Panigrahi (IIT Delhi, India), Nilanjan Senroy (Indian Institute of Technology, India)	303
Energy Resource Scheduling in an Agriculture System Using a Decision Tree Approach Omid Abrishambaf (Polytechnic of Porto, Portugal), Pedro Faria (Polytechnic Institute of	
Porto, Portugal), Zita Vale (Polytechnic Institute of Porto, Portugal)	309
Real-Time Approach for Demand Response Tariffs Definition Using Decision Trees	
Catia Silva (Polytechnic Institute of Porto, Portugal), Pedro Faria (Polytechnic Institute of Porto, Portugal), Zita Vale (Polytechnic Institute of Porto, Portugal)	314
Multi-Step Load Demand Forecasting Using Neural Network	
Sonu Kumar Jha (Indian Institute of Technology Kanpur, India), Chaman Lal Dewangan (Indian Institute of Technology Kanpur India, India), Nishchal K Verma (Indian Institute of	
Technology Kanpur, India)	320

# Intelligent systems technique to operation, planning and optimization in power

Generating Feature Sets for Day-Ahead Load Demand Forecasting Using Deep Neural Network	
Sonu Kumar Jha (Indian Institute of Technology Kanpur, India), Seetaram Maurya (Indian Institute of Technology Kanpur, India), Nishchal K Verma (Indian Institute of Technology Kanpur, India)	326
Autonomous Micro-Market Operation on the Low Voltage Network	
Peter Kadar (Obuda University, Hungary)	332
Scheduling of EV Charging Station for Demand Response Support to Utility	
Praneeth M v s s r (Indian Institute Of Technology Hyderabad, India), Charan Teja S (Indian Institute of Technology Hyderabad, India), Pradeep Kumar Yemula (Indian Institute of Technology Hyderabad (IITH) & India Smart Grid Forum (ISGF), India)	337
A Case Study on Energy Efficient Green Building with New Intelligent Techniques Used to Achieve Sustainable Development Goal	
Sagar Sagar (JC Bose University of Science and Technology Faridabad, India), Poonam Singhal (JC Bose University of Science and Technology YMCA Faridabad, India)	343
Intelligent systems technique to protection and control in power	
Impact of Sensitivity Index Based Transmission Network Topology Control on Contingency Constraints	
Arup Ratan Bhowmik (National Institute of Technology, Agartala, India), Ajoy Kumar Chakraborty (National Institute of Technology, Agartala & NIT Agartala, India), Siddhartha Mukherjee (National Institute of Technology, Agartala, India)	350
Optimal Parameter Tuning of Power Oscillation Damper by MHHO Algorithm	
Ramesh Devarapalli (Indian Institute of Technology (ISM), Dhanbad, India), Biplab Bhattacharyya (Indian School of Mines, Dhanbad, India)	357
A Machine Learning Approach to the Identification of Voltage Control Area Using Synchrophasor Measurements	
Fazle Kibriya (Birla Institute of Technology, Mesra, Ranchi, India), Dinesh Kumar Mahto (Birla Institute of Technology, Mesra, Ranchi, India), Dusmanta Kumar Mohanta (Birla Institute of Technology Mesra, Ranchi, India)	364
Control of PV-Battery System for Resiliency Improvement	JUT
Guna Naga Venkata Mohan (IIT Bhubaneswar, India), Chandrashekhar Narayan Bhende (Iit Bhubaneswar, India), Anurag Srivastava (Washington State University, USA)	370
Super-Twisting Algorithm Based Load Frequency Control of a Two Area Interconnected Power System	
Albert Poulose (Government Engineering College Thrissur Kerala, India), Ramesh Kumar P (Government Engineering College Thrissur, India & Kerala Government, unknown)	375
PMU Based Data Driven Approach for Online Dynamic Security Assessment in Power Systems	
Prajwal Jaiswal (IIT Dhanbad, India), Sayari Das (IIT DELHI, India), Bijaya Ketan Panigrahi (IIT Delhi, India)	380