



3rd International Symposium on Sustainable Energy And Technological Advancements

(23rd – 24th February 2024)

ISSETA 2024 Special Session on Use of Data-Driven Analytics, Statistics, and Optimization for Planning, Operation, and Control of Modern Engineering Systems

Aims and scope of the session:

The use of data-driven models in engineering systems has gained extensive research attention due to their accuracy and ease in modeling highly nonlinear systems. Data-driven models extract critical information from the data that characterize a strategy and establish relations among input, internal, and output variables without knowing their physical behavior. On this note, in-depth treatments of statistics, computational intelligence, optimization, data analytics, etc., are imperative. Though machine learning models are fundamental data-driven modeling frameworks, fractional calculus adds another dimension to enrich existing data-driven models. It is a dominating research area in recent times. Though the application of data-driven models inspired researchers to adopt mathematical tools in modern engineering systems, they are deterministic and fail to combat system uncertainties. Recently, probabilistic methods have gained increasing interest due to their ability to provide realistic decisions during system planning, operation, and control. Researchers have a great scope to apply data analytics, statistics, and optimization to solve modern engineering system problems.

Topics of interest:

This special session invites research papers from the following topics (but not limited) to further recognize the role of data-driven analytics, statistics, and optimization for performance enhancement of modern engineering systems.

1. Data preprocessing approaches for data-driven modeling.
2. Growing impact of data science in the energy industry
3. Power system planning and operation using data-driven models.
4. Long-term and short-term uncertainty analysis and modeling of renewable generations.
5. Modeling of predictable variation of power system uncertain inputs.
6. Utilization of data-driven models for renewable generation forecasting.
7. Accelerating the energy transition using artificial intelligence
8. Role of big data analytics in energy and utilities
9. Prediction and optimization for power and energy systems
10. Smart grid resilience: methods and challenges
11. Forecasting of renewable power generation using fractional-order neural networks.
12. Data-driven optimization framework for unit commitment considering demand and renewable generation uncertainties.
13. Probabilistic load flow under system and input uncertainties.
14. Generation and transmission expansion planning of modern power systems
15. Role of stochastic optimization for modern power system operation and decision-making.
16. Optimal placement and planning of distributed systems with renewable generations.
17. Risk-based security assessment in modern power systems.
18. Reliability assessment of modern power systems.

Special session organizers:

1. Dr. B Rajanarayan Prusty

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Dr. B Rajanarayan Prusty (Senior Member, IEEE) is a Professor and Associate Dean - Research in the School of Engineering, Galgotias University, Greater NOIDA, INDIA. He obtained his Ph.D. from the National Institute of Technology Karnataka, Surathkal. His exceptional research work during his Ph.D. has led him to crown the prestigious POSOCO Power System Awards for 2019 by Power System Operation Corporation Limited in partnership with IIT Delhi. In recognition of his publications from 2017 to 2019, he was awarded the University Foundation Day Research Award-2019 from BPUT, Odisha. He has 30 SCI journal publications and 50 international conference publications. He has authored 10 book chapters. He has co-authored a textbook entitled "Power System Analysis: Operation and Control" in I. K. International Publishing House Pvt. Ltd. He has also edited two books for CRC Press. He has been an active reviewer and has reviewed more than 500 manuscripts. He is the Associate Editor of "Journal of Electrical Engineering & Technology," and "International Journal of Power and Energy Systems." He is also the Academic Editor for the journals (i) "Mathematical Problems in Engineering," (ii) "International Transactions on Electrical Energy Systems," and (iii) "Journal of Electrical and Computer Engineering." He has handled more than 200 manuscripts in the capacity of Journal Editor. His research interests include data preprocessing, time series forecasting, high-dimensional dependence modeling, and applying machine learning and probabilistic methods to power system problems.



2. Dr. Kishore Bingi

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Kishore Bingi received the B.Tech. Degree in Electrical and Electronics Engineering from Acharya Nagarjuna University, India, in 2012. He received the M.Tech. Degree in Instrumentation and Control Systems from the National Institute of Technology Calicut, India, in 2014, and a PhD in Electrical and Electronic Engineering from Universiti Teknologi PETRONAS, Malaysia, in 2019. From 2014 to 2015, he worked as an Assistant Systems Engineer at TATA Consultancy Services Limited, India. From 2019 to 2020, he worked as Research Scientist and Post-Doctoral Researcher at the Universiti Teknologi PETRONAS, Malaysia. From 2020 to 2022, he served as an Assistant Professor at the Process Control Laboratory, School of Electrical Engineering, Vellore Institute of Technology, India. Since 2022 he has been working as a faculty member at the Department of Electrical and Electronic Engineering at Universiti Teknologi PETRONAS, Malaysia. His research area is developing fractional-order neural networks, including fractional-order systems and controllers, chaos prediction and forecasting, and advanced hybrid optimization techniques. He is an IEEE and IET Member and a registered Chartered Engineer (CEng) from Engineering Council UK. He serves as an Editorial Board Member for the International Journal of Applied Mathematics and Computer Science and Academic Editor for Mathematical Problems in Engineering and the Journal of Control Science and Engineering.



3. Dr. Neeraj Gupta

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Dr. Neeraj Gupta is Ph.D. in power systems from Indian Institute of Technology Roorkee, Roorkee, India. He is a senior member of IEEE. He was a faculty with the Thapar University, from 2008 to 2009, Adani Institute of Infrastructure Engineering, Ahmedabad, India, in 2015 and NIT Hamirpur from 2015 to 2018 and presently, he has been working as an Assistant professor with the Electrical Engineering Department, National Institute of Technology, Srinagar, J&K, India. His work has been published in international journals of repute like IEEE, Elsevier etc. He is presently guiding 04 Ph.D. scholars in power systems. He has also supervised 08 M.Tech. and 06 B.Tech. dissertations. He has more than 50 SCI/Scopus journal publications/conference publications/book chapters to his credit. He has edited three books titled “Control of standalone microgrid (Elsevier 2021)”, Renewable Energy Integration to the Grid: A Probabilistic Perspective (CRC press 2022) and “Smart Electrical and Mechanical Systems: An Application Publisher (Elsevier 2022)”. He has been an active reviewer since 2015 and has reviewed 200 manuscripts submitted to repute SCI-indexed Journals/conferences. He has delivered 15 invited expert talks in various organizations in India. He is also the scientific advisory/organizing secretary of many reputed conferences of the country. He is referee of reputed journals of IEEE, Elsevier, Taylor and Francis, IET etc. He has been included in the list of top 2% highly cited scientists by Stanford University working in power in 2021/2023. His research interests include uncertainty quantification of power system, probabilistic power system, solar, wind, and electric vehicle technologies, Artificial intelligence, Machine learning, prediction etc.

