

SERB Karyashala High end Workshop **on** **Data Analytics in Electrical Energy** **System**

22 –28 March, 2023



sponsored by SERB, DST, Govt. of India

Coordinators:

Dr. Deepak M.

Dr. Shihabudheen K V

Organized by



Department of Electrical Engineering
National Institute of Technology Calicut
NIT Campus P.O.,
Kozhikode ,Kerala– 673601

About Karyashala

Science and Engineering Research Board (SERB) a statutory body under the Department of Science and Technology, Government of India has inaugurated an Inter-Ministerial Initiative 'Accelerate Vigyan (AV) Scheme' to provide a big push to high-end scientific research and prepare scientific manpower which can venture into research careers and knowledge-based economy. AV aims to expand the research base in the country, with three broad goal consolidation/aggregation of all scientific training programs, initiating high-end Orientation Workshops, and creating opportunities for Research Internships. Under AV scheme, is an attempt to boost Research & Development in the country by enabling and grooming potential PG and Ph.D. level students by developing dedicated research skills in selected areas/ disciplines/fields through High-End orientation workshops 'KARYASHALA'. This will be especially important for those researchers who have limited opportunities to access such learning capacities/facilities/infrastructure.

About the Department

Electrical Engineering Department of NIT Calicut was established in 1961. The Department offers an undergraduate program in Electrical and Electronics Engg., post graduate programmes in Instrumentation & Control Systems, Industrial Power and Automation, High Voltage Engineering, Power System and Power Electronics as well as research programmes leading to Ph.D. Degree

About NIT Calicut

National Institute of Technology Calicut was founded as Regional Engineering College, Calicut in 1961. Set in a

picturesque at the foothills of the Western Ghats, it is located about 22 kilometers north-east of Calicut city. It is prestigious institute with a reputation for excellence at both undergraduate, postgraduate and research levels, fostering the spirit of national integration among the students and a close interaction with industry. Members of the faculty have active collaborations with universities and elite institutions within and outside India for research and have active consultancy for industries. For details, see the website: www.nitc.ac.in

About Calicut

God's own country Kerala, has plenty of places that are of historical and tourist interest. Kozhikode also known as Calicut, is a city in the state of Kerala in southern Indian on the Malabar Coast. This region is a major knowledge hub of Kerala and it proudly hosts many institutions of national eminence such as NITC, IIMK, NIELIT, CWRDM, Kerala School of Mathematics, IISR etc. Calicut is well connected by rail/road/air to major cities in India. Apart from the serene beaches on the west and the high ranges of the Western Ghats on the east, there are many landmark places that attract attention of the tourists. NITC is 22 km off the city limits towards east and is located at Chathamangalam.

Course Objective

Data analytics has already taken root in the energy industry. The workshop discusses how exactly data analytics can drive value in the electric power sector. Electric utilities go for smart grids with advanced metering infrastructure and big data capabilities to get strategic insights that would foster efficient energy use. Based on the experience gained from cooperation with electric utilities, recent advancements show practical examples of how big data analytics augments the energy industry. It's not news that failures in the energy

industry equipment may result in catastrophic power blackouts and vast sums of money spent on new assets, restoration works and energy losses. To avoid or minimize such outcomes, development of efficient equipment monitoring systems and predictive maintenance approach, the key technologies of which are smart meters and big data. Electric power quality influences the safe operation of a power grid and consumers' satisfaction. Fortunately, big data software goes far beyond detecting disturbances a posteriori.

Realizing the need of the time, the present workshop is aimed to give lectures and training on data analytics, big data, machine learning and deep learning techniques in different power system applications. The participants will be exposed to the basics and fundamentals behind the algorithms with applications.

Topics covered:

- Data analytics including big data: A new science
- Fundamental mathematics for data science
- Energy big data characterization
- Barriers to adopt big data analytics in power systems
- Enhanced Demand Response with Data Analytics
- Equipment Monitoring and Life Extension by Predictive Fault Detection
- Renewable Forecasting
- Operations-Planning Convergence
- Dimensionality reduction methods and clustering
- Data Analytics in Energy Market
- Cyber security issues in power system
- Machine Learning Algorithms for Data Analytics
- Deep learning algorithms

- Python/Matlab Programming Language during Lab Session
- Working on real-time examples.
- Industrial visit

Course Outcomes

On completion of this course, participants are expected to be capable of understanding the basics of data analytics and algorithms, how they can be used, analyse in power system applications. Participants are also expected to solve some real-time problems through programming with Python/Matlab.

Resource persons

All the sessions will be handled by faculty experts from IIT/IIIT/IIST/NITs and experts from leading Academic /R&D/Industry.

Who should attend?

The program is meant to support motivated PG and Ph.D. level students, who are having a strong willingness to get excellence in their scientific and engineering research pursuits.

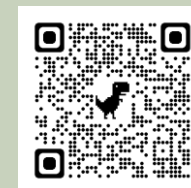
The applicants should produce a declaration form along with "No Objection Certificate (NOC)" from the institute for allowing their student to undergo training in the workshop, if selected.

How to apply

Declaration form along with NOC in the prescribed format duly filled up in all respects, should reach the

coordinator through google form
<https://forms.gle/E1jiDPmnavtgAcqGg6>
before the last date.

Scan the QR code for the above google form:



Important dates:

Last date (Application)	10.03.2023
Selection List by E- mail	11.03.2023

Note:

- No participant fees will be collected. Participants are limited to 25
- TA will be provided subjected to fund availability
- Accommodation will be provided in hostel guest rooms subjected to availability.
- 100% attendance is compulsory.

For query contact:

Mr. Jyothis Sebastian, Research Scholar, EED.

Mob: +91 8301852448

Email: powerenergygroupnitc@gmail.com