



Institution Making Students Ready for “Industry 4.0”

Editor in Chief

Prof.Y.Mohamed Badcha,
Asso. Prof / EEE

***Faculty
Members***

1. Dr. G. Sundararajan, Asst. Professor (Sr.G) / EEE
2. Mr. S. Karthikeyan, Asst. Professor / EEE
3. Mrs. AR. Manjula Devi, Asst. Professor / EEE

Student Members

1. G.Kiruthika Sri, IV year/EEE
2. S.Lisha, IV year/EEE
3. V.Mohith, III year/EEE
4. V.Singaravel, III year/ EEE
5. M.Asath Ali, II year/EEE

***Editorial
Board***



EEE NEWS LETTER



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

INDEX

- ✚ Editorial Board
- ✚ Vision and Mission
- ✚ PEOs, POs, PSOs
- ✚ Major event
- ✚ Faculties Achievements



- To provide students with high quality education so that they are well prepared to become high caliber Electrical and Electronics Engineers, and it aspires to grow to the level of gaining global recognition.



- Developing competent technocrats who strive continuously in pursuit of professional excellence in the field of Electrical and Electronics Engineering.
- Developing and sustain a culture of research while promoting values, ethics and professionalism.
- Offering well balanced curriculum to help students acquire professional competencies and to arrange placements for students.
- Developing state of the art infrastructure and research for effective teaching learning process.
- Strengthening of soft skills especially for rural students through co-curricular and extra-curricular activities.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

| PEOs | Content |
|------|--|
| PEO1 | Find employment in Core Electrical and Electronics Engineering and service sectors. |
| PEO2 | Get elevated to technical lead position and lead the organization competitively. |
| PEO3 | Enter into higher studies leading to post-graduate and research degrees. Become consultant and provide solutions to the practical problems of core organization. |
| PEO4 | Become an entrepreneur and be part of electrical and electronics product and service industries. |

PROGRAM OUTCOMES (POs)

| POs | Title | Content |
|-----|--|--|
| PO1 | Engineering knowledge | Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering Problems. |
| PO2 | Problem analysis | Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering Sciences. |
| PO3 | Design/development of solutions | Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. |
| PO4 | Conduct investigations of complex problems | Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. |
| PO5 | Modern tool usage | Create, select, and apply appropriate techniques, resources, and modern engineering and communication tools including prediction and modeling to complex engineering activities with an understanding of the limitations . |

| | | |
|-------------|--------------------------------|---|
| PO6 | The engineer and society | Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the Professional engineering practice. |
| PO7 | Environment and sustainability | Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. |
| PO8 | Ethics | Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. |
| PO9 | Individual and team work | Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings. |
| PO10 | Communication | Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. |
| PO11 | Project management and finance | Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| PO12 | Life-long learning | Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |

PROGRAM SPECIFIC OUTCOMES (PSOs)

| PSOs | Content |
|-------------|--|
| PSO1 | Foundation of Electrical Engineering: Ability to understand the principles and working of electrical components, circuits, systems and control that are forming a part of power generation, transmission, distribution, utilization, conservation and energy saving. Students can assess the power management, auditing, crisis and energy saving aspects. |
| PSO2 | Foundation of Mathematical Concepts: Ability to apply mathematical methodologies to solve problems related with electrical engineering using appropriate engineering tools and algorithms. |
| PSO3 | Computing and Research Ability: Ability to use knowledge in various domains to identify research gaps and hence to provide solution which leads to new ideas and innovations. |

MAJOR EVENT

The Centre for Human Resource Development and the Department of IT organized a special lecture on 'How to Write Research Papers for SCI-Indexed Journals / IEEE Transactions.' Dr. P. Vijayakumar, Professor & Dean, Computing Sciences delivered the lecture on 29.09.2025.

J.J. COLLEGE OF ENGINEERING AND TECHNOLOGY
Approved by AICTE | Affiliated to Anna University | ISO 9001 : 2015 Certified
Accredited by NAAC with A Grade

SOWDAMBIKAA GROUP OF INSTITUTIONS

ESTD. 1994

ACCREDITED WITH GRADE **A** NAAC

Centre for Human Resource Development
and
Department of Information Technology
Organizes
Special Lecture on

“How to Write Research Papers for SCI Indexed Journals/ IEEE Transactions”

29.09.2025

Seminar Hall

Dr.P.Vijayakumar
(Top 2% Scientist - listed by Stanford University, USA
Ranked 65th position in India among Best Scientists by
Research.com)
Professor and Dean
Department of Information Technology

www.jcet.ac.in | JJCET3807 | /sowdambikaajcet | 98428 11776, 98652 11776

FACULTIES' ACHIEVEMENTS

Dr. G. Sundararajan and Mr. Y. Mohamed Badcha visited M/s Industrial Rubber Company, Thanjavur, on 27.09.2025 regarding consultancy work.

Dr. G. Sundararajan has published a paper in IEEE Xplore titled **Real- Time Quantum Machine Learning Based Anomaly Detection for Lithium-Ion Battery Packs and Identification of Defective Cell.**

Dr. P. Balakrishnan has published a paper in IEEE Xplore titled **A Secure and Scalable IoT Architecture for Smart Energy monitoring in Urban Infrastructure.**

IEEE Xplore® Browse My Settings Help Institutional Sign In

Real-Time Quantum Machine Learning-Based Anomaly Detection for Lithium-Ion Battery Packs and Identification of Defective Cell

Publisher: IEEE Cite This PDF

Sivakumar P.; Jagadeesh V.; Sundararajan G. All Authors

Abstract
Lithium-ion batteries are widely used in applications ranging from electric vehicles to renewable energy storage, making real-time monitoring essential for ensuring safety and efficiency. Anomalies such as cell degradation, thermal runaway, and overcurrent conditions can lead to severe performance issues and potential hazards. Clustering-based anomaly detection is a common approach for identifying such irregularities, but traditional methods like K-Means face challenges in efficiently processing high-dimensional battery monitoring data, adapting to dynamic changes, and distinguishing between transient fluctuations and genuine anomalies. Quantum K-Means, which utilizes quantum state encoding and entanglement, offers a different approach by accelerating distance computations between data points and centroids, improving performance in real-time applications. This study focuses on detecting defective battery cells through anomaly detection while also ensuring cell balancing to enhance battery longevity. By integrating real-time clustering with historical trend analysis, the detection framework can effectively distinguish between persistent faults and temporary fluctuations, reducing false positives. A comparative analysis is conducted between Hybrid Quantum K-Means clustering and various classical clustering algorithms to evaluate their effectiveness in identifying anomalies and optimizing battery performance by finding the defective cell. The findings provide insights into the advantages and limitations of quantum-enhanced clustering techniques in real-time battery pack monitoring and cell balancing.

Published in: 2025 7th International Conference on Energy, Power and Environment (ICEPE)

Date of Conference: 09-11 May 2025 DOI: 10.1109/ICEPE0905.2025.1139777

Date Added to IEEE Xplore: 05 September 2025 Publisher: IEEE

Proceedings of the 8th International Conference on Computing Methodologies and Communication (ICCMC-2025)
IEEE Xplore Part Number: CFP25K25-ART, ISBN: 979-8-3315-1211-8

A Secure and Scalable IoT Architecture for Smart Energy Monitoring in Urban Infrastructure

S. Sathish Kumar¹
Associate professor
Department of EEE
M.Kumarasamy College of Engineering,
Karur, Tamilnadu-639113
sathishphd2k17@gmail.com

S. Vasanthi²
Associate Professor
Department of Information Technology
Sona College of Technology,
Salem 636005
vasanthivedhamoorthy@gmail.com

P. Balakrishnan³
Professor
Department of EEE
J. J. College of Engineering and Technology
Tiruchirappalli - 620 009
bala4k@yahoo.com

S. Govtham⁴
Assistant Professor,
Department of EEE,
K. S. R. College of Engineering
Tiruchengode-637215
govthamsbramianan26@gmail.com

S. Senthil Kumar⁵
Assistant Professor,
Department of EEE,
K. S. R. College of Engineering
Tiruchengode-637215
senthilkumar@gmail.com

Yuvaraja Thangavel⁶
Associate Professor,
Department of ECE,
Konguadu College of Engineering and
Technology, Thottiam, Trichy
kstyvaraja@gmail.com

Abstract— Emerging populations within urban areas need efficient secure energy monitoring systems to aid sustainable city planning. Centralized traditional IoT frameworks demonstrate multiple difficulties when employed across multiple different urban infrastructure systems because they face delays together with security threats and framework limitations. An architectural transition is needed to face the rising integration of smart meters and distributed energy resources and electric vehicles because it will focus on speed optimization with precise data maintenance and protection against unauthorized usage. The authors introduce an IoT-

that operate efficiently and maintain resilience. Smart energy monitoring systems use IoT, AI and data analytics to deliver live energy use data for pattern analysis and resource optimization and breakdown detection [1][2]. These systems supply urban planners alongside policymakers and utilities together with authorities that permit them to create informed decisions leading to lower energy waste and lowered operational costs and minimized environmental impacts. The implementation of smart energy solutions in urban spaces simultaneously addresses rising power requirements and

Dr. P. Balakrishnan has published an article in the IEEE Canadian Journal of Electrical and Computer Engineering titled **Advanced Prediction and Coated Solar Panel Performance Improvement Using Combined Long Short-Term Memory (LSTM) Architecture and Autoregressive Moving Average (ARMA) Technique.**

IEEE CANADIAN JOURNAL OF ELECTRICAL AND COMPUTER ENGINEERING, VOL. 48, NO. 4, FALL, 2025 313

Advanced Prediction and Coated Solar Panel Performance Improvement Using Combined Long Short-Term Memory (LSTM) Architecture–Autoregressive Moving Average (ARMA) Technique

Amélioration des performances des panneaux solaires revêtus grâce à une architecture combinée à mémoire à court et long terme (MLCT)

Balakrishnan Pappan¹, Durairaj Sankaran², and Sathiya Selvaraj³

Abstract—As solar energy has become a critical renewable resource, precise forecasting systems for photovoltaic (PV) solar panel power generation are becoming increasingly important. These panels were treated with hydrophobic coatings to increase their effectiveness and efficiency. In response to the increased demand for precise power forecasting, a new smart power prediction system was created specifically for coated PV solar panels. This novel approach used a hybrid model that included autoregressive moving average (ARMA) and long short-term memory (LSTM) approaches to successfully capture both short-term and long-term correlations in efficiency and output data. This method increased forecasting accuracy while addressing the constraints of older methods involving limitations in capturing both short-term and long-term dependencies in solar power generation data, reduced forecasting accuracy, and inefficiencies in feature extraction. Advanced feature extraction techniques, most notably the discrete wavelet transform (DWT), were used to identify important temporal and frequency patterns in solar insolation data. Following thorough testing and validation, the system achieved a very high accuracy of 98.3%, outperforming previous models by 2.3%. The deployment of this system resulted in considerable increases in PV efficiency, allowing for greater grid integration and energy management, ultimately contributing to a more sustainable energy future.