

FACULTY PROFILE



Dr. M. Thirumalai, M.E., Ph.D
Assistant Professor(SG) – ECE

HIGHLIGHTS:

- Number of Journal Publications: **38**
- H-Index: **10**
- Project Funding Received: Nil
- Patents Published: **29**
- Patents Granted: Nil

PROFESSIONAL LINKS:

- Scopus ID: **16308253800**
- Scopus Link: **<https://www.scopus.com/authid/detail.uri?authorId=16308253800>**
- Google Scholar ID :
https://scholar.google.com/citations?hl=en&user=aob2McAAAAAJ&view_op=list_works&authuser=1&sortby=pubdate
- Anna University Faculty ID: **2122739**
- AICTE Faculty ID: **1-3384036195**
- Anna University Supervisor ID: **4730014**
- LinkedIn: Nil

PROFESSIONAL BACKGROUND:

- Teaching Experience Till Date: **13.5 Years.**

AREA OF SPECIALIZATION:

- Energy Trading in power system.
- Allocation of Renewable Energy Sources.

- Virtual Power Plant allocation.
- Power System Resilience.
- Allocation of Distributed Energy Sources.
- Optimization of Smart Grids.
- Allocation of DFACTS and EVCS.
- Economic Load Dispatch through Optimization Techniques.

PATENTS PUBLISHED:

1. IOT Based Monitoring System for NBSP Coal Mine Using Arduino.
2. Artificial Neural Network Based Vehicle Tracking System for Anti-Theft Application.
3. Deep Learning and IOT Based Scalable Energy management System for Smart Grids.
4. Deep Learning Based Energy Tracking System for Electric Vehicles.
5. Development of Machine Learning Based Smart Electric Vehicle Battery Management System.
6. Novel Technique for Maintenance of Solar Power Based Electric Vehicle Charging Booths.
7. A Autonomous Electric Truck Integrated with Solar Power.
8. Introduce the Virtual Power Plant for Electrical Vehicle Charging Station.
9. Energy Management System for Electric Boat Charging.
10. Self – Healing Microgrid Technology.
11. Smart Demand Response System for Commercial Buildings.
12. AI-Driven Smart Grid Energy Trading platform.
13. Decentralized Charging Network for Electric Vehicles.
14. Multi-Functional Electric Vehicle Battery Swap Stations.
15. Enhanced Grid Fault Detection System Using AI.
16. Hybrid Renewable Energy-Powered Water desalination System.
17. Modular Renewable Energy System for disaster Resilience.
18. IOT-Enabled Energy Monitoring and Control System.
19. Energy Harvesting Pavement for Urban Areas.
20. Automated Energy Optimization System for Industrial Processes.
21. Energy Efficient HVAC System Integrated with Renewable Sources.
22. Smart Energy Grids with Predictive Maintenance Features.
23. Distributed Solar Panel Array with Block Chain for Peer-to-Peer Energy Trading.
24. Advanced Protection Relay System for Medium and Low Voltage Networks.
25. Automatic Voltage Regulation System for Power Distribution Networks.
26. Energy - Efficient Transformer Design With Intelligent Load Management.
27. Fault Detection and Isolation Mechanism for electrical Distribution Networks.
28. Iot - Enabled Monitoring and Control System for Power Distribution Grids.
29. Smart Grid - Based Power Distribution System with Adaptive Load Balancing.

PUBLICATIONS:

1. Physics-informed fault-resilient renewable forecasting and energy management for smart grids using a graph neural network–transformer framework - **Energy Nexus - 2026.**
2. Coordinated synchronous condenser-BESS framework for enhancing system

strength, fault resilience, and frequency stability in renewable-dominated distribution networks - **Energy Conversion and Management: X – 2026.**

3. Optimized energy trading system for smart grids: Enhancing prosumer profitability through multiple trading mechanisms and integration of various appliances - **e-Prime - Nexus of Electrical, Electronic, and Intelligent Engineering – 2026.**
4. A resilient and carbon-aware virtual power plant coordination framework for low-carbon energy systems using multi-objective optimization - **Energy Conversion and Management: X - 2026.**
5. Enhancing decentralized community energy systems through an auction theoretic transactive market framework for efficient demand response and renewable integration - **Unconventional Resources – 2026.**
6. Optimisation-driven technical, economic, and environmental enhancement of renewable and EVCS-integrated faulted Indian distribution networks using DFACTS devices - **Energy Exploration and Exploitation - 2026.**
7. Artificial Intelligence–driven cyber–physical energy resilience framework for secure and sustainable smart distribution networks - **Energy Strategy Reviews – 2026.**
8. Integration of renewable energy with electric vehicle systems: A review of charging infrastructure, vehicle-to-grid technologies, and energy management - **Exploration and Exploitation – 2026.**
9. Scenario-Based Optimization Framework for Virtual Power Plant Operation Integrating Renewable Energy, Electric Vehicles, and Contingency Management Using the Harris Hawks Optimization Algorithm - **International Transactions on Electrical Energy Systems - 2026.**
10. Edge-AI Co designed Powered Converter for fault predictive Grid interactive Inverters - **International Conference on Smart Futuristic Technology, ICSFT – 2026.**
11. Renewable-Based Distributed Generation Allocation to Mitigate the Impact of EV Charging Stations - **Lecture Notes in Electrical Engineering – 2026.**
12. Integrated optimization of solar DG and DSTATCOM placement for enhanced EVCS-Driven Power Distribution Performance - **Energy Exploration and Exploitation – 2026.**
13. Multi-objective coordinated optimization of renewable-based EV charging

stations with user-centric scheduling and grid support in distribution networks - **e-Prime - Advances in Electrical Engineering, Electronics and Energy – 2025.**

14. Dynamic optimization of solar DG and shunt capacitor placement to mitigate the impact of EV charging stations on power distribution network - **Results in Engineering – 2025.**
15. Hierarchical ZnCo₂O₄/MoS₂@rGO nanocomposite on nickel foam: a promising electrode for advanced energy storage – **Ionics – 2025.**
16. Cheetah optimization-based smart energy management for appliance scheduling and DER integration in residential and commercial-industrial grids - **Energy Conversion and Management: X - 2025.**
17. Resilient VPP cost optimization in DER-driven microgrids for large distribution systems considering uncertainty during extreme events - **Energy Conversion and Management: X - 2025.**
18. Smart energy management for revenue optimization and grid independence in an Indian RDS - **Energy Conversion and Management: X - 2025.**
19. Optimization of Power Loss Mitigation in Distribution Systems Using Hunter Prey Optimization Algorithm for Multiple Types of DFACTS - **Power Energy and Secure Smart Technologies - 2025.**
20. Optimal Placement of Renewable Based DG and DSTATCOM in Distribution Systems to Alleviate the Effects of EVCS - **Power Energy and Secure Smart Technologies - 2025.**
21. Strengthening Resilience in Distribution Networks through Microgrid Development and Integration of Distributed Energy Resources Using the Group Instruction Optimization Algorithm - **Power Energy and Secure Smart Technologies - 2025.**
22. Reliability Analysis of Distribution Systems with Solar-Based DG and Capacitor Integration Using the Water Cycle Optimization Algorithm - **Power Energy and Secure Smart Technologies - 2025.**
23. Intelligent Residential Energy Control with Demand Response Incorporating Renewable Power Sources and Electric Vehicle Integration - **Power Energy and Secure Smart Technologies - 2025.**

24. Enhancing Distribution System Performance by Optimizing Electric Vehicle Charging Station Integration in Smart Grids Using the Honey Badger Algorithm - **Scientific Reports – 2024.**
25. Dynamic Optimization of Renewable Generators and Compensators Placement to Mitigate Electric Vehicle Charging Station Impacts Using the Spotted Hyena Algorithm - **Sustainability, MDPI – 2024.**
26. Minimizing the impact of electric vehicle charging station with distributed generation and distribution static synchronous compensator using PSR index and spotted hyena optimizer algorithm on the radial distribution system - **e-Prime - Advances in Electrical Engineering, Electronics and Energy - 2024.**
27. Optimizing Distribution System Resilience in Extreme Weather Using Prosumer-Centric Microgrids with Integrated Distributed Energy Resources and Battery Electric Vehicles - **Sustainability, MDPI – 2024.**
28. Design and Development of LiFi Assisted Intelligent Data Transmission Using Secured Wireless Communication Principles - **IEEE Conference Proceedings – 2024.**
29. IoTWP: Design and development of Internet of Things Assisted Weather Prediction Scheme with Advanced Remote Tracking Norms - **IEEE Conference Proceedings – 2024.**
30. Optimizing Solar-Based DGs Allocation to Minimize the Impact of EVCS and Emission Reduction in Distribution Systems - **IEEE Conference Proceedings – 2024.**
31. Enhancing resilience of distribution systems through microgrid formation and integration of DERs using group teaching optimization algorithm - **IEEE Conference Proceedings – 2024.**
32. Mitigating the impact of EV Charging Stations on RDS through optimized allocation of RDGs and capacitor - **IEEE Conference Proceedings – 2024.**
33. Optimal Sitting and Sizing of DSTATCOM Using Fruit Fly Algorithm - **AIP Conference Proceedings – 2022.**
34. Energy Meter with Real-Time Electricity Bill Prediction - **Green Energy and Technology – 2022.**

35. Application of Bat Optimization Algorithm for Power System Loss Reduction Using DSSSC - **Smart Innovation, Systems and Technologies – 2021.**
36. Optimization of the Size of Dstatcom System Based on Data – Driven Control Design - **International Journal of Innovative Technology and Exploring Engineering – 2019.**
37. Simultaneous Allocation of Shunt Capacitor and Distributed Generator in Radial Distribution Network Using Modified Firefly Algorithm - **IEEE Conference Proceedings – 2019.**
38. Design and Implementation of Hybrid Multilevel Inverter for High Output Efficiency - **IEEE Conference Proceedings – 2013.**