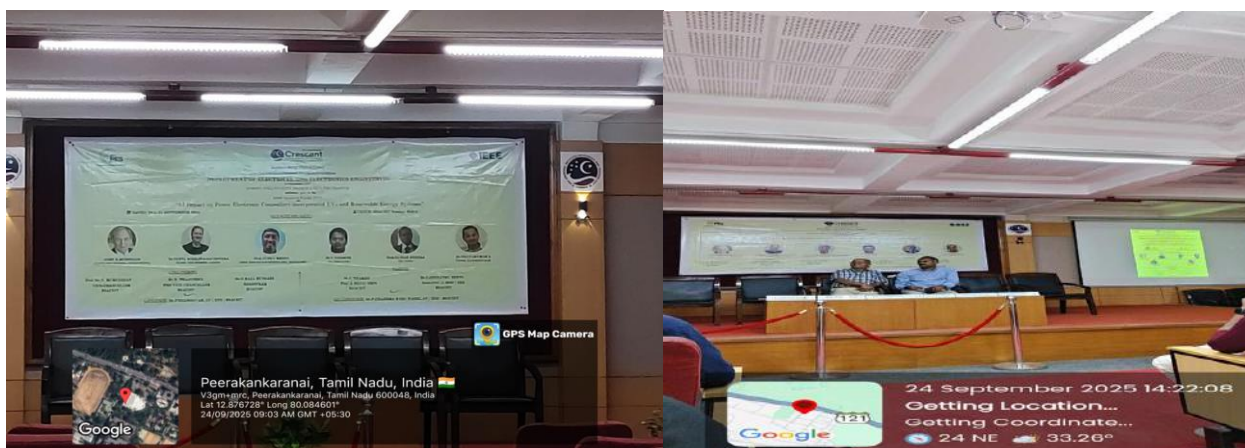


A Report on Two-day STTP**“AI Impact on Power Electronic Controllers incorporated EVs and Renewable Energy Systems”****Organised by Department of Electrical & Electronics Engineering**
in Association with BSACIST IEEE Student Branch & IEEE PES Chapter
from 24.09.2025 to 25.09.2025**Report Submitted by: Mr N Sridhar, Assistant Professor, Department of Electrical & Electronics Engineering.****Venue: Crescent Institute of Science and Technology, GST Road, Vandalur, Chennai.****Participants: 50 (25 Faculty, 25 Students)****Mode of Conduct: Offline****Time: 10.00am to 5.00pm****Report Received on 04.10.2025.**

The Department of Electrical and Electronics Engineering, in association with BSACIST IEEE Student Branch and IEEE Power & Energy Society (PES) Chapter, organized a Two-Day Short Term Training Programme (STTP) on “AI Impact on Power Electronic Controllers incorporated EVs and Renewable Energy Systems” on 24th & 25th September 2025.

The training programme focused on recent advancements in Artificial Intelligence (AI) applied to Power Electronic Controllers, specifically targeting Electric Vehicles (EVs) and Renewable Energy Systems. Eminent academicians, researchers, and industry professionals delivered expert talks covering a wide spectrum of emerging technologies and applications.

Objectives of the STTP

- To provide exposure to AI-based approaches in power electronics.
- To discuss AI-driven control strategies for electric vehicles.
- To introduce the role of AI in renewable energy conversion and grid modernization.
- To highlight recent innovations in converter design, storage, and intelligent controllers.
- To facilitate knowledge sharing between academia, researchers, and industry experts.

Day 1 – 24.09.2025 (Wednesday)

- **9:00 AM – 9:30 AM:** Registration
- **9:30 AM – 10:00 AM:** Inauguration of the STTP
- **10:00 AM – 10:30 AM:** Tea Break

Session I (10:30 AM – 12:30 PM):**Dr. B. Subba Reddy, Chief Research Scientist, IISc, Bengaluru, Karnataka, India****Topic: Recent Trends in Renewable Energy Conversion Systems using Artificial Intelligence**

This session highlighted the integration of AI with renewable energy systems for improving efficiency, stability, and forecasting. Dr. Reddy discussed AI-based predictive algorithms for solar and wind energy output, intelligent fault detection, and optimization techniques for Maximum Power Point Tracking (MPPT). The importance of data-driven decision-making for reducing intermittency challenges in renewables was also emphasized.

Lunch Break (12:30 PM – 2:00 PM)

Session II (2:00 PM – 4:00 PM):

Dr. R. Kumar Behera, Associate Professor, Department of Electrical Engineering, IIT Patna, India

Topic: AI Techniques in the Design of Hybrid Electric Vehicles



Dr. Ranjan Kumar Behera elaborated on the application of AI in power train optimization, battery management, and regenerative braking in hybrid EVs. He introduced neural networks and fuzzy logic controllers for improving vehicle performance, range prediction, and real-time decision-making. Case studies from recent EV prototypes and industrial applications were also discussed.

Session III (6:00 PM – 8:00 PM):

Dr. Tanya Kirilova Gachovska, Power Engineer, MDA Space, Montreal, Canada (On Line)

Topic: Power Electronics Control Circuits using GaN Devices

This technical session explored the advantages of Gallium Nitride (GaN) devices in power electronics, such as higher switching frequency, lower losses, and compact design. Dr. Tanya explained how AI can be used to monitor, protect, and optimize GaN-based converters for high-performance EV and renewable applications. Future directions in aerospace and space-grade power electronics were also highlighted.

Day 2 – 25.09.2025 (Thursday)

Session IV (9:30 AM – 10:30 AM):

Mr. John D. McDonald, Founder & CEO, JDM Associates, LLC, United States (On Line)

Topic: Intelligent Electronic Devices (IEDs) in Grid Modernization

This session focused on how AI-enabled Intelligent Electronic Devices (IEDs) enhance grid reliability, resilience, and security. Mr. McDonald explained the role of IEDs in smart substations, fault monitoring, and self-healing grid systems. He highlighted how AI is shaping grid modernization for integrating renewable energy sources and EV charging infrastructure.

Tea Break (10:30 AM – 11:00 AM)

Session V (11:00 AM – 12:30 PM):

Dr. V. Vignesh, Assistant Professor, IIT Tirupati, Andhra Pradesh, India

Topic: AI Techniques in Power Controlled EVs

Dr. Vignesh presented advanced AI algorithms for controlling traction in electric vehicles, energy efficiency improvements, and adaptive speed regulation. He also discussed reinforcement learning for EV drive cycle optimization and AI-assisted inverter control for smoother vehicle performance.

Lunch Break (12:30 PM – 2:00 PM)

Session VI (2:00 PM – 3:30 PM):

Dr. Vijayakumar Krishnasamy, Associate Professor, IIITDM, Kancheepuram, Tamil Nadu, India

Topic: Design of Power Converters in Electric Vehicles

This session dealt with the design and optimization of DC-DC and DC-AC converters specifically tailored for EV applications. Dr. Vijayakumar explained how AI-based controller tuning can enhance converter efficiency, reduce thermal stresses, and extend the lifetime of EV components. Simulation case studies and future prospects of bidirectional converters in Vehicle-to-Grid (V2G) integration were also covered.

3:30 PM – 4:00 PM: Valedictory Ceremony & Certificate Distribution

During the ceremony:

- Participants shared their feedback, highlighting the usefulness of AI-based insights in power electronics, EVs, and renewable systems.
- Certificates were distributed to all registered participants who actively took part in the two-day programme.
- The Convenor and Organizing Team expressed gratitude to the distinguished speakers from India and abroad for their valuable contributions.
- Special thanks were extended to the management, IEEE Student Branch, and IEEE PES Chapter for their support in making the event a success.

Outcomes of the STTP

- Provided a comprehensive understanding of AI applications in renewable energy and EV systems.
- Helped participants gain insights into the design of intelligent power controllers and converters.
- Created a platform for interaction between international experts, industry leaders, and researchers.
- Motivated students and faculty towards innovation, project development, and research in this emerging field.

The ceremony concluded with a formal vote of thanks, followed by the National Anthem.