ICSCGE 2024
SPECIAL SESSION 03

ICSCGE

The 4th International Conference on Smart City and Green Energy

December 10-13, 2024 | Sydney

Advanced Voltage Control Strategies for Active Distribution Networks with High Intermittent Renewables

Introduction and Topics

Voltage control is facing significant challenges with the increasing integration of various renewable energy resources and electric vehicle charging stations into active distribution networks. The intermittent nature in renewable power generation and uncoordinated charging scheduling of electric vehicles have raised severe power quality issues, such as voltage violations, three-phase imbalances, excessive renewable power curtailment, etc. Existing voltage control methods, based on conventional mechanical devices (e.g., on-load tap changers and capacitor banks) with discrete action domains and slow timescales, are not able to rapidly respond to complex and uncertain network operating conditions for voltage regulation. In this case, the application of smart inverters, efficient coordinated control schemes, and advanced machine learning techniques is anticipated to develop innovative voltage control strategies, effectively addressing these challenges. This special session seeks to advance voltage control strategies for highly renewable energy-penetrated active distribution networks, with consolidation of novel voltage control models and methods that can efficiently enhance the voltage control performance in terms of security, rapidity and optimality. We welcome submissions that provide theoretical insights, empirical studies, or practical applications, all converging towards our shared objective of advancing the knowledge and capabilities necessary for optimal voltage control of smart grids.

List of topics of interest includes, but are not limited to the following:

- Hierarchical voltage control schemes for efficient coordination of various voltage control devices
- Novel voltage control models with electric vehicle scheduling, three-phase voltage balancing, conservation voltage reduction, and network reconfiguration
- Applications of machine learning techniques to voltage control in active distribution networks, such as deep learning and deep reinforcement learning
- Efficient design and coordination of smart inverter Volt/Var and Volt/Watt functions with customer fairness consideration
- Advanced cyber-resilient voltage control methods in cyber-physical active distribution networks
- Modelling and optimization for voltage-stability constrained operation in renewable-dominated systems

Special Session Chairs

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IMPORTANT DATES

- **Submission Deadline** September 10, 2024
- **Notification Deadline** October 10, 2024
- **Camera-Ready Deadline** November 30, 2024

Publication

Submissions will be reviewed by the conference technical committees, and accepted papers will be published in ICSCGE 2024 International Conference Proceedings, which will be submitted for inclusion in the **IEEE Xplore Digital Library**, and submitted for indexing by EI compendex and Scopus.

PAPER SUBMISSION

Submit your full paper or abstract via the following link: **https://icscge.org/sub.html** or scan the QR code on the right.

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