



## SPECIAL SESSION XVIII

### Data-driven solutions for e-mobility

ORGANIZED AND CHAIRED BY

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E-mobility (Electric Vehicles and Electric Buses, etc.) is poised to influence the future of transportation significantly. Recent technological advancements, particularly in computational units and the widespread availability of data facilitated by technologies like 5G, have grown interest among scholars in leveraging data-driven solutions. Consequently, this special session focuses on exploring and discussing innovative data-driven approaches for e-mobility. A data-driven solution for e-mobility involves leveraging data analytics, machine learning algorithms, innovative technologies, and smart algorithms to improve different aspects of electric mobility, including charging infrastructure, vehicle performance, user experience, and overall system efficiency.

Topics of interest for publication include but are not limited to:

- **Charging Infrastructure Optimization:**  
Optimizing charging infrastructure requires strategic placement of stations based on demand, supply, traffic, and geography for EV user convenience.
- **Smart Charging Management:**  
Smart charging management uses real-time data to balance power grid load, encourages off-peak charging, and ensures efficient resource use through dynamic pricing models.
- **Range Optimization:**  
Range optimization utilizes historical driving data and environmental conditions to predict vehicle range, effectively planning journeys and alleviating range anxiety.
- **Vehicle to Grid (V2G):**  
V2G enables Electric Vehicles (EVs) to not only draw energy for charging but also contribute surplus energy back to the grid, transforming them into mobile energy storage units and supporting grid stability during peak demand.
- **Vehicle to Everything (V2X):**  
V2X technology allows electric vehicles to communicate with their surroundings, including charging infrastructure, other vehicles, and the grid. This two-way communication enhances the overall efficiency and flexibility of the system.
- **Fleet Management:**  
Fleet management for e-mobility involves optimizing operations through data-driven solutions, such as route planning, charging schedules, and predictive maintenance, to ensure cost-effectiveness and efficiency.



- o **Renewable Energy Integration:**

Integrating Renewable Energy Sources (RESs) into e-mobility involves aligning charging schedules with high renewable energy production periods, contributing to a greener and more sustainable electric transportation ecosystem.

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