

# Annual Conference of the IEEE Industrial Electronics Society (IECON 2022)

## Special Session on

### “Hybrid Strategies for Smart Energy Management and Storage in Electric Vehicles”

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## THEME:

The increasing use of automobiles is creating a serious concern towards human life and global warming. The performance and fuel consumption of Electric Vehicles (EVs), Hybrid Electric Vehicles (HEVs) are greatly designed by breakthrough the EMS (energy management strategy) to develop high-level energy storage capacity with rechargeable energy storage systems. Hybrid smart energy management is anticipated by integrating technologies such as the battery, Supercapacitor (SC), and Fuel Cell (FC). Batteries have not developed to provide the instantaneous high-power exchange during sudden acceleration and deceleration. They typically provide the steady-state power and have their own high response time. Hybrid topologies meet the demand of high starting torque, regenerative braking, etc. The hybrid topologies create significant challenges in upcoming technologies based on the state of charge (SOC), load profile, and the DC bus connection in managing the power required at the wheels. Even the design of converters for managing the various hybrid sources is also challenging in terms of its reliability, volume, greater productivity, lesser ripples, etc. Battery together with SC and FC makes an excellent hybrid energy source for EVs. The voltage characteristics also have to match perfectly with each source, to utilize the full power capacity of each source. The challenges for integrating the sources (of different characteristics) in EV are with the developing high power density dc-dc converters technology and intelligent control for energy management among the sources. Hybridization of renewable energy sources (RES) with batteries as a storage system is used to increase the duration of power supply, by optimally using the available renewable energy resource, to achieve higher reliability compared to individual energy sources.

## **TOPICS OF INTEREST INCLUDE, BUT ARE NOT LIMITED TO: -**

- Smart energy management in electric vehicle
- Optimal sizing of the battery, supercapacitor, and fuel cell.
- Topologies for various power management strategies
- Design of power-sharing algorithms for converters between various energy sources
- Artificial intelligence for monitoring battery state of charge and state of health
- Fractional order control approach for PV and battery systems
- Energy management for PV and battery systems
- High power density batteries for EV system
- Control of bidirectional converters for regenerative braking dual energy sources
- Battery management system and its charging technologies
- Thermal management for electric vehicle applications

### **Submissions Procedure:**

All the instructions for paper submission are included in the conference website: <https://iecon2022.org/>

**Endorsed by** IES Technical Committee on Energy Storage <https://sites.google.com/view/ies-energy-storage-tc/home>

### **Deadlines:**

Full paper submission:	April 15, 2022
Paper acceptance notification:	June 17, 2022
Camera-ready paper submission:	July. 29, 2022

**Please send this completed document to:** [ss@iecon2022.org](mailto:ss@iecon2022.org)