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IET *Cyber-Physical Systems: Theory & Applications*

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Special Issue:

Cyber-Physical Aspects of EVs and HEVs

Rapidly growing concerns about an energy crisis are creating unprecedented popularity for electric vehicles (EVs) and hybrid electric vehicles (HEVs) because of their potential for low operating costs, petroleum savings, national security improvements, and environmental benefits. EVs and HEVs make use of electric motors either as the unique maneuvering unit or in combination with internal combustion engines (ICEs). With the assistance of electric motors, EVs and HEVs can achieve higher fuel economy and lower emissions than conventional ICE-powered vehicles.

Generally, this special issues focuses on the cyber-physical aspects of modeling, design, control, and optimization of EVs and HEVs, including but not limited to: (i) embedded and cyber-physical software design, function verification, transportation security, and automotive driving, etc., which are critical for the design, automation and control of the next-generation of smart and self-driving vehicles; (ii) smart renewable energy harvesting techniques such as photovoltaics (PV), piezo-electronics (PZ) or thermal electric generation (TEG), which are integrated in the cyber-physical control loop of next-generation smart EVs/HEVs and can effectively harvest the available ambient or thermal energy to assist vehicle propulsion and control; (iii) grid-connected EVs/HEVs and the corresponding optimal charging/discharging control to enhance grid stability without significantly affecting the state-of-health (SoH) of the vehicle battery pack; (iv) cyber-physical control for EVs in battery charging stations, especially the emerging battery swapping stations, to achieve an effective balance among battery charging/swapping speed, battery SoH degradation, grid stability, charging cost, etc.

A more specific topic list for this special issue includes, but is not limited to:

- Embedded and cyber-physical software design for EVs/HEVs
- Function verification and transportation security of EVs/HEVs
- Automotive driving using machine learning and deep reinforcement learning techniques
- Power train control and power splitting for HEVs and plug-in HEVs
- Onboard PV technology, novel and/or transparent PV technology for vehicles, maximum power point control and reconfiguration, etc.
- Onboard piezo-electronic and thermal electric generation: new technology, optimal deployment and control, etc.
- Grid-connected EVs/HEVs and optimal charging/discharging with awareness of dynamic pricing and battery aging
- Grid stability enhancement with grid-connected EVs/HEVs
- Cyber-physical control of EVs in battery charging stations and battery swapping stations, optimal charging scheduling of EVs
- Optimal deployment of battery charging stations and/or battery swapping stations

All submissions are subject to the journal's peer-review procedures. The authors should follow the journal's Author Guide at <http://digital-library.theiet.org/journals/author-guide> when preparing papers for submission to the Special Issue.

Important dates:

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Publication Date:
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