Special Issue

Battery Management Processes, Modeling, and Optimization

Message from the Guest Editors

The model-based engineering solution framework for electric vehicle battery packs encompasses three crucial components: battery management, battery modeling, and battery optimization. Battery management processes (BMPs) encompass a diverse set of techniques and procedures meticulously designed to enhance battery performance, efficiency, and overall lifespan. Battery modeling, a fundamental aspect of the framework, encompasses a variety of approaches such as computational fluid dynamics (CFD), electro-thermal models, circuit models, and surrogate or neural network models. In parallel, battery optimization aims to achieve real-time adaptivity, cost analysis, model predictive control, and multi-objective optimization. By synergizing battery management, modeling, and optimization, this comprehensive framework serves as a sophisticated foundation for advancing electric vehicle battery technology. It enables manufacturers and researchers to create cutting-edge battery solutions, ensuring electric vehicles are safer, more efficient, and more reliable, thus propelling the widespread adoption of sustainable transportation.

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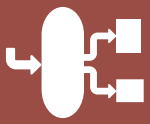

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