

Transformative Role of Battery Ecosystem in AI-Dominated Digital World

Panelists:

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We will introduce our newly proposed research theme of the electric vehicle (EV) battery ecosystem and its transformative role in the AI-dominated digital world. The EV battery ecosystem is a system that covers the lifecycle of EV battery packs, from battery design and manufacturing to recycling, charging operation, and uninterrupted green power supply for EV charging stations and data centers.

The convergence of mobility and electrification is widely seen as a solution to climate-related transportation challenges, and battery EVs are growing exponentially each year. The government and industry have invested significantly in batteries to meet the growing needs of EVs. However, the fast-growing battery industry has encountered a bottleneck in the relevant battery-specific research and workforce development. For this purpose, we propose an AI-based research theme on the battery ecosystem.

Key technologies developed from this theme will include physical model-based AI approaches to EV battery recycling, system management, extremely fast charging (XFC) DC power supply, and XFC station management. The accuracy and computing speed of the conventional data-based AI approaches will be improved by incorporating proper physical models, end-to-end DC power supply systems will be developed to reduce XFC power supply problems, and human factors will be investigated for enhanced EV user charging experience. A sustainable EV battery lifecycle will be eventually achieved, and the corresponding research results will be used to train highly skilled battery workforces for the EV industry. Our battery ecosystem and green electric power from photovoltaics will also play a transformative role in the bio-economy.