Optimization of Lithium-ion Battery Performance and Longevity using Reinforcement Learning on a Digital Twin by Optimal Charging and Thermal Management

Research Gaps:

- Industry is seeking more insights on how Reinforcement Learning can work on a digital twin of the energy storage to identify the charging strategies that are optimal for the battery health and performance, but it requires creation and maintenance of a high-fidelity digital twin of the energy storage.
- Energy storage needs to be thermally conditioned to be ready for a highly anticipated use.
- Reinforcement Learning will be sued for controlling the charging and the climate via a multi-objective approach that can preferably lead to policy gradients

Outcomes:

Application of Reinforcement Learning to the digital twin of the Li-ion battery system that can improve the performance considering the dynamic health of the system, its usage and anticipated usage.

1 Master's degree thesis OR 1 BS thesis: RL for the Batter system

1 Master's degree thesis OR 1 BS thesis: Digital twin of the Lithium-ION battery system

Industrial Partners:

Coventry University UK, MIRA Research Center