National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: A Novel Battery Health Prediction Method Based on Q-learning Approach
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Venue	: Seminar Room (EE-205)
Date and Time	: 23 Jul 2025 (4:50 PM)

Abstract : Battery health prediction is an important aspect of the battery management system (BMS), which assures safety, reliability, and sustainability in applications such as electric vehicles (EVs). This paper proposes a new technique for battery health prediction using a Q-learning algorithm which is a powerful Reinforcement learning (RL) technique. It is a type of machine learning in which an agent gains decisionmaking skills through interaction with its environment. The proposed algorithm has been utilized for battery State-of-Health (SoH) estimation in terms of battery capacity which has been considered for computing the State-of-Charge (SoC). It incorporates the optimal tuning of the hyperparameters (i.e. learning rate, discount factor) using Grid search optimization (GSO) within the Q-learning algorithm. The simulation results provide a comparative analysis of the reference SoC computed from the Coulomb counting (CC) method and estimated SoC obtained by the proposed Q-learning algorithm. The proposed approach has been validated on two different NASA battery datasets (B0006 and RW9).