National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Support Vector Regression based Generalized Framework for the Health Assessment of Lithium-ion Batteries
Speaker	: Dr. Arijit Guha
Supervisor	: Prof. Arijit Guha
Venue	: Seminar Room (EE-205)
Date and Time	: 06 Oct 2025 (10:00 AM)
Abstract	: Recent advancements in electric vehicle (EV) technology have created a strong need for new battery health evaluation techniques that can be integrated into Battery Management Systems (BMS) to provide more accurate predictions. Many existing methods are limited because they perform well only on the specific datasets used for model training. This study presents a more generalizable approach for assessing the health of lithium-ion batteries (LiBs). The challenge lies in identifying a set of features from the voltage profile. In this work the increase in voltage drop across the cell's internal resistance is used as a key feature along the degradation. A Support Vector Regression (SVR) model is employed to establish the overall relationship between battery voltage and State of Health (SOH). The SVR model was trained using a relatively small amount of battery data and then tested blindly on the CALCE and NASA PCoE datasets. The SOH estimation achieved mean absolute error (MAE) and root mean squared error (RMSE) values within 3.5%.