A Project Abstract on

Prediction of Battery States in Electric Vehicles with Machine Learning

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ABSTRACT

This study addresses the challenge of accurately predicting battery states in electric vehicles (EVs) to enhance performance, safety, and longevity. It focuses on developing an Explainable Data-Driven Digital Twin framework to predict critical parameters like State of Charge (SOC) and State of Health (SOH) under varying conditions.

The methodology integrates advanced machine learning algorithms such as DNN, LSTM, CNN, SVM, RF, and XGBoost to build a robust and accurate digital twin model. Explainable AI techniques are employed to ensure transparency and to identify factors influencing battery performance.

Results indicate that the integrated model significantly outperforms traditional methods in prediction accuracy and robustness, showcasing its capability to adapt to diverse operational scenarios effectively.

This research highlights the potential of Explainable Digital Twins to revolutionize battery management systems, enabling smarter, more adaptive EV technologies and contributing to the advancement of sustainable mobility solutions.

Keywords: *Electric Vehicles, Battery State Prediction, Digital Twins..*

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