

PREFACE

All praise and gratitude are due to God Almighty for His infinite blessings, guidance, and grace, which have enabled the successful completion of this thesis, titled **"BATTERY HEALTH PREDICTION FOR ELECTRIC MOTORCYCLE USING MACHINE LEARNING"**. This thesis is presented in fulfillment of the requirements for the Master's degree in Electrical Engineering at Telkom University.

The research presented in this thesis focuses on addressing a critical challenge in the growing field of electric vehicle (EV) technology. With the increasing adoption of EVs, particularly two-wheeled electric vehicles, the implementation of efficient and safe battery management systems has become paramount. This study explores innovative solutions for predicting the State of Health (SoH) of batteries using machine learning algorithms, aiming to enhance safety, reliability, and user experience in battery swap systems at public charging stations. By leveraging advanced techniques such as Random Forest, Neural Network, Gradient Boosting, K-Nearest Neighbor, and Decision Tree, the proposed method demonstrates its capability to deliver precise SoH predictions and minimize safety risks.

Some parts of this thesis also have been submitted to The 7th International Conference on Information and Communications Technology (ICOIACT) 2024 and Bulletin of Electrical Engineering and Informatics.

This work would not have been possible without the invaluable support and encouragement of many individuals and institutions. I am deeply indebted to my advisors and faculty members for their expert guidance, constructive feedback, and unwavering support throughout this journey. Their insights and expertise have been instrumental in shaping the direction and quality of this research.

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Lastly, I am profoundly grateful to Telkom University for providing an exceptional academic environment and resources that have facilitated the successful completion of this study. It is my sincere hope that the findings of this research contribute meaningfully to the advancement of electric vehicle technology and inspire

future studies in this field.

Bandung, 17th February, 2025

A handwritten signature in black ink, consisting of stylized, overlapping loops and lines, likely representing the name Marsha Clarabell.

MARSHA CLARABELL