

**DEVELOPMENT OF RULE BASED EMS FOR A SMALL SCALE HYBRID
POWERED GO-KART**

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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The automotive industry is currently facing significant challenges. As a primary contributor to global carbon dioxide emissions, it is under pressure from governments worldwide to shift toward cleaner propulsion methods—specifically, electric vehicles (EVs) and hybrid electric vehicles (HEVs)—to replace traditional internal combustion systems. This thesis aims to design a small-scale hybrid vehicle, focusing on the Energy Management System (EMS) of an in-house built HEV. The study includes simulations of pure EV, ICE, and HEV versions of the same vehicle, development of the EMS, and its implementation on the chassis. The previous iteration of this project focused solely on the electric powertrain, where the chassis was converted to electric and suffered from limited operating time and space. By implementing the hybrid system, the operating time of the vehicle can be extended, allowing for a comparison of efficiency across different platforms in both the short and long term.

Keywords: Automotive Industry, Energy Management System, Hybrid Electric Vehicle, Internal Combustion Engine,



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DEDICATION

I dedicate this work to my family, SGU and to my country, Indonesia.



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I would like to thank my parents for supporting and encouraging me throughout my endeavors and this journey. Their support has helped me throughout my life and will continue to do so in the future.

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I have found my coursework throughout the Curriculum and Instruction program to be stimulating and thoughtful, providing me with the tools with which to explore both past and present ideas and issues. They have also provided me with invaluable real-life experiences to prepare me for the future even after graduation.

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