

**Development of fully Automated and Assisted Ackerman Steering on an
Autonomous Mobile Robot**

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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.



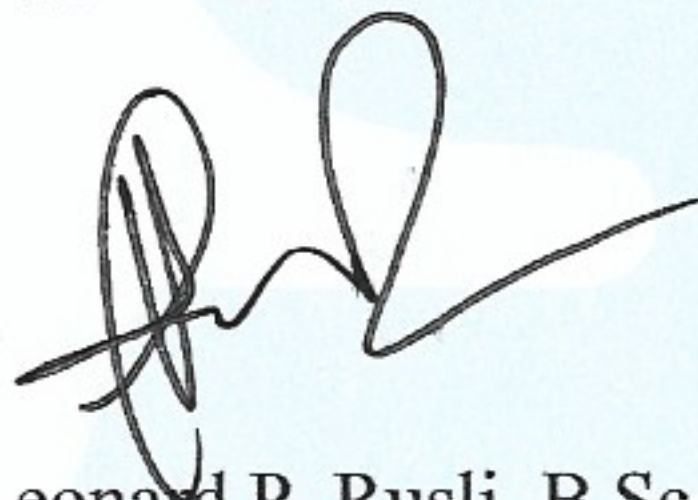
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ABSTRACT

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This thesis presents the development of a fully automated and assisted Ackermann steering system for an electric vehicle (EV), originally developed by previous students. The primary focus of this research is the integration of a power steering module capable of autonomous operation, enhancing both manual and automated control functionalities of the vehicle.

A major challenge encountered was the inadequacy of the vehicle's initial front suspension design, which lacked a proper rack and pinion steering mechanism and resulted in a poor turning radius. To address this, a comprehensive redesign of the front suspension system was undertaken to accommodate the new steering assembly and ensure compatibility with autonomous control modules.

The new system was developed using Robot Operating System (ROS)-based architecture, integrating various sensors including IMU, and rotary encoders to support real-time environmental perception and vehicle control. The successful implementation of this steering system contributes to improved maneuverability, safety, and system scalability, and demonstrates the feasibility of retrofitting advanced steering solutions into the EV platforms.



DEDICATION

I dedicate this works for my future.



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