DEVELOPMENT OF F1TENTH CAMERA BASED NAVIGATION USING ROS2

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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

DEVELOPMENT OF F1TENTH CAMERA
BASED NAVIGATION USING ROS2

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This project focuses on lane detection in autonomous driving using a camera sensor and ESP32 microcontroller integrated with the ESP-IDF framework. The goal is to accurately identify and track lane markings on the track. The system is further integrated with ROS2, a robotics middleware framework, to enable seamless communication and integration with other ROS2 nodes. Camera sensors are widely used in autonomous driving due to their affordability and versatility. By leveraging computer vision algorithms, the system performs real-time lane detection. The ESP32 microcontroller, running the ESP-IDF framework, interfaces with the camera sensor and performs the lane detection process. Integration with ROS2 allows the lane detection system to exchange data and collaborate with other ROS2-based components, enabling advanced functionalities in autonomous driving. This project provides a cost-effective and scalable solution for lane detection in autonomous driving. The combination of camera, ESP32 IDF, and ROS2 integration offers a powerful platform for developing autonomous driving systems.

Keywords: ESP32 IDF, Autonomous Driving Car, ROS2, Lane Detection, Camera Sensor.

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DEDICATION

I dedicate this works for God, my families, advisor, friends, lecturers,
and the future of the country, Indonesia as well as
the development of technology in Mechatronics field of study.

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