UNIVERSITI TEKNOLOGI MARA

TRUCK'S BLIND SPOT DETECTION SYSTEM

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ABSTRACT

Blind spots, those obscured from a driver's view in mirrors or windows, present heightened dangers for heavy vehicles like trucks and buses, given their larger blind spots compared to smaller counterparts. The alarming frequency of accidents involving heavy vehicles, often attributable to restricted visibility in these blind spot areas, underscores the critical need for effective safety solutions. This study is a direct response to this challenge, aiming to develop a blind spot detection system utilizing Arduino technology. By employing a combination of hardware and software, this system generates alerts when objects are detected near the blind spot, significantly mitigating accident risks. This innovative solution not only contributes to safety but also prioritizes the well-being of drivers. The system's outputs serve as a proactive measure, aiding in accident prevention and creating a more secure driving environment. Moreover, the integration of both hardware and software components showcases the versatility and sophistication of the proposed blind spot detection system. The multifaceted benefits extend beyond accident prevention. This system introduces a new era of driving convenience and stress reduction for operators of heavy vehicles. By addressing the challenges associated with blind spots, it transforms the driving experience into a safer, more manageable task. The implication is clear — the blind spot detection system is not just an optional addition but an essential component for enhancing road safety. In conclusion, this research underscores the pressing need for blind spot detection systems in heavy vehicles, advocating for increased attention to their incorporation. By achieving the project objectives, the implementation of this blind spot detection system emerges as a transformative force, promising a safer, more efficient future for operators of heavy vehicles on the road.

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CHAPTER ONE
INTRODUCTION

1.1 Research Background

The research background for the study on blind spot detection systems for trucks and heavy vehicles emerges from the critical need to address safety challenges associated with inherent blind spots in these large and imposing vehicles. The substantial size and design of trucks create areas around them that are challenging for drivers to monitor effectively, leading to an increased risk of accidents, particularly in dense urban traffic. The intensification of traffic and urbanization further underscores the need for advanced safety technologies to navigate complex road scenarios. Blind spot-related accidents involving trucks have severe consequences, prompting researchers to explore and implement systems that mitigate these risks and enhance overall road safety. Evolving regulatory standards and industry trends emphasize the incorporation of advanced safety features in heavy vehicles, aligning with the growing adoption of innovative technologies in the transportation sector. The advancement of sensor technologies, such as radar and lidar, presents opportunities to develop sophisticated blind spot detection systems that can provide real-time information to drivers. Understanding human factors and driver behaviour is integral to optimizing the effectiveness of these systems, ensuring they are user-friendly and contribute to informed decision-making. Additionally, a comprehensive analysis of the cost implications and potential benefits associated with implementing blind spot detection systems is crucial for assessing their economic feasibility and overall impact on operational efficiency. In summary, the research background encompasses a holistic exploration of the challenges, risks, and opportunities associated with mitigating blind spots in trucks and heavy vehicles, with the ultimate goal of enhancing road safety and preventing accidents.