Design and fabrication of Emergency Braking System in four wheeler

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ABSTRACT

The design and fabrication of an emergency braking system for four-wheelers presents a critical advancement in automotive safety technology. This system aims to mitigate the severity of collisions by providing an additional layer of autonomous braking capability in emergency situations. Through a combination of sensor fusion, machine learning algorithms, and hydraulic control mechanisms, the system detects imminent collisions and triggers rapid braking to reduce vehicle speed and minimize impact forces. The fabrication process involves integrating sensors such as radar, lidar, and cameras into the vehicle's architecture while ensuring seamless communication between components for real-time decision-making and precise braking action. The development of this emergency braking system signifies a significant step forward in enhancing vehicle safety standards and reducing the frequency and severity of accidents on the road. By providing an automated response to emergency situations, the system offers drivers an extra layer of protection and helps prevent collisions in scenarios where human reaction time may be insufficient. Additionally, the integration of advanced braking technologies not only enhances the

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safety of occupants but also contributes to the broader goal of achieving sustainable and accident-free transportation systems.

Keywords: Emergency Braking System, Four-Wheeler Safety, Design Optimization, Fabrication Techniques, Vehicle Collision Prevention.

Synthesis and Characterisation of MgO reinforced Polyaniline Composites

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ABSTRACT

The Magnes Oxide (MgO) nanoparticles were synthesised by the Sol-gel method, and pure Polyaniline (PANI) and Polyaniline with MgO (PANI-MgO) were synthesized at various weight percentages of MgO such as 1%, 10% and 15% by the oxidation polymerization method. The XRD pattern of MgOnanoparticles confirmed the formationcubic structure, and its particle size which was estimated by Scherrer formula as 19 nm. The UV-Visible (UV-Vis) absorption spectra recorded 200-1200 nm wavelength region and the band gap were calculated from Tauc Plot. The morphology of PANI and PANI-MgO composites were observed like non-homogenous and agglomerated by high resolution scanning electron (HRSEM). The FTIR spectra confirm the functional groups of the synthesized materials. The electrochemical properties of cyclic voltammetry (CV), Galvanostatic charge-discharge (GCD) results confirm 5% PANI-MgO have good cyclic stability, then the frequency response behaviour of nanocomposites was confirmed by EIS spectra.

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