

Development of an Automatic Smart Side Stand

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Abstract

The development of an automatic smart side stand for motorcycles aims to enhance rider safety by preventing accidental riding with the stand deployed. This research introduces a smart side stand system, utilizing Arduino as the core microcontroller due to its ease of use, cost-effectiveness, and ability to handle real-time operations efficiently. Arduino provides the flexibility to integrate sensors and control systems, making it ideal for this application. When the motorcycle's ignition switch is turned on, the system retracts the side stand automatically, preventing accidents caused by riding with the stand down. Similarly, the stand deploys automatically when the motorcycle comes to a stop, and the ignition is switched off, ensuring added convenience for the rider. This mechanism eliminates the risk of human error during stand operation. The research focuses on optimizing the system for quick response times and ensuring compatibility with various motorcycle models. The automatic smart side stand is tested under different conditions to assess its performance, reliability, and user-friendliness. The results show that the system significantly reduces the risk of accidents related to stand misuse, enhances rider safety, and offers a convenient, user-friendly experience. As a final result, the Arduino-based smart side stand system not only met the research goals but exceeded expectations in terms of safety, convenience, and reliability. The successful implementation of the system demonstrated its practicality for modern motorcycles, with potential for future improvements such as wireless connectivity and integration with other smart vehicle technologies. Finally, a solution is expected to contribute positively to rider safety in both urban and rural settings.

Keywords: *Automatic smart side stand, Motorcycle safety, Arduino technology, Automation, Rider convenience.*