

# Automatic Electromagnetic Braking System

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**Abstract:** *This project aims to design and implement an Automatic Electromagnetic Braking System that leverages advanced sensors, Arduino (control mechanisms to autonomously engage and modulate braking forces), Relays, adapting to dynamic driving conditions in vehicles ( Specially in cars ). The project involves integrating sensors for real-time data acquisition, developing control algorithms for automated braking, and ensuring seamless integration with existing vehicle systems. The goal is to create a system that enhances vehicle safety by providing rapid and precise braking response to imminent collisions with other vehicles (accidents) or unexpected obstacles. The system utilizes a combination of proximity sensors, which continuously monitor the distance to nearby objects. Upon detecting a potential collision risk, the sensors send signals to an Arduino microcontroller. The Arduino processes these signals and, if necessary, activates an electromagnetic braking mechanism via relays.*

**Keywords:** Automatic Electromagnetic Braking System, Advanced Sensors, Arduino Control Mechanisms, Autonomous Braking, Modulate Braking Forces