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Smart Fire Protection and Suppression System

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Abstract: *Fire hazards pose a significant threat to life, property, and the environment, necessitating the development of smart and efficient fire fighting solutions. This project presents an intelligent Fire Protection System that integrates both manual and automatic operation for enhanced flexibility and control. Unlike traditional fire fighting methods, which are costly and require extensive human intervention, this system leverages advanced sensors, automated suppression mechanisms, and wireless communication to ensure a rapid and effective response to fire incidents. A motorized fire suppression unit with precision nozzles ensures optimized water and CO_2 distribution, minimizing resource wastage. The system is powered by an ESP32 microcontroller, enabling wireless communication via Wi-Fi or GSM, providing remote monitoring and control. The inclusion of LiDAR and GPS-based autonomous navigation allows the system to move toward fire-affected areas independently, making it suitable for hazardous environments.*

Keywords: fire fighting

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