

Forest Fire Detection using Optimized Solar Powered Zigbee Wireless Sensor Networks

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Abstract: *This paper focuses on creating a comprehensive system for detecting forest fires. Forest fires are a significant and frequent type of disaster, and this specific application aims to address the limitations of MODIS and Basic Wireless Sensor Networks. To facilitate gradual development and integration as additional sensors are added alongside the temperature sensor, the system is divided into five distinct components. It introduces a new operational model for detecting forest fires and employs zero models for wireless sensor networks using ZigBee, in line with industry standards. Given the rapid spread of forest fires, the system is designed to operate in near real-time, minimizing any delay. The implementation uses three fire sensors, which trigger a water pump when fire is detected, and send the data to the base station via ZigBee. An IoT-based ZigBee Wireless Sensor Network (WSN) was developed for a smart forest fire alarm system. All output parameters are tested, and using ZigBee wireless communication technology, the system can automatically detect and respond to flames. This approach ensures that ZigBee meets the fire parameter coverage requirements while maintaining low power consumption and efficient wireless communication*

Keywords: ZigBee, WSN, MODIS, IoT, Fire detection