

INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

(INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM is designed with IoT to detect the fire and notify)

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LITERATURE REVIEW

GSM-based smart fire and high-temperature detection system

AUTHOR: Koggalage et al.(2021)

This project has been made to help the responsible person of the “Solar Inverter Room”, to overcome the problem that occurred when fire spreads or temperature increasing happened whenever the responsible person is not nearby. Based on the results obtained, the fire alert system is doable and functional for the residents, and factories to protect their assets. Users can simply apply the device in their interested area to protect the area from the existence of fire and heat. Whenever the temperature reaches the limit (30 °C) or the smoke level reaches its limit, the device will instantly alert the users by sending a message via GSM.

Early Fire Detection on Video Using LBP and Spread Ascending of Smoke

AUTHOR: J Olivares-Mercado et al.(2019)

This study proposes an early smoke detection method using images from video sequences, which is based on detecting the motion, color, and texture properties, estimated in cascade to delimit the candidate smoke region, where the texture is analyzed using the LBP and LBPV operators. Finally, if the candidate regions maintain an upward expansion, the presence of smoke is determined, and an alarm is activated. The evaluation results show that the proposed system provides a good detection rate of smoke, with enough robustness against several scenarios.

Dependable Fire Detection System with Multifunctional Artificial Intelligence Framework

AUTHOR: Park J.H., Lee S., et al.(2019)

This paper, proposed the usage of MAI-FDS to solve these problems. MAI-FDS adopts a multifunctional AI framework with an IoT data collection block, a context pre-processing block, and a context decision block. Each functional block in the framework has high flexibility depending on its applications. MAI-FDS showed much higher fire recognition capability than legacy FDSs based on rules, CNN, and fuzzy methods. If a melting furnace is used in a factory, the temperature is very high and there is a continuing presence of flames, which can increase the false positive rate in MAI-FDS. Therefore, in future research, it is necessary to develop a system that can modify the fire.

Review of Fiber Optic Sensors for Structural Fire Engineering

AUTHOR: Bao Y., Huang Y., et al(2019)

This paper reviews the sensing principles, fabrication, key characteristics, and recent applications of three classes of fiber optic sensors (i.e., grating, interferometer, and distributed sensors) in the context of structural fire engineering. Fiber Bragg Grating (FBG) sensors that can measure temperature and strain at temperatures up to 1300 °C using fused silica fibers have been reported, however, sophisticated processes are required to achieve gratings stable at temperatures above 400 °C. It has been the author's experience that this requires more attention to be paid to sensor installation and data interpretation. Fiber optic interferometer sensors have been developed to allow for the measurement of temperatures up to 1200 °C and strain up to about 10%

Design and Application of Fuzzy Logic-Based Fire Monitoring and Warning Systems for Smart Buildings

AUTHOR: Barera Sarwar et al.(2018)

In this research paper, the fuzzy logic-based Fire Monitoring and Warning System (FMWS) is presented to save lives and property damages. The objective of this paper is to detect true-fire incidents at the early stage and alert people and extinguish the fire as soon as possible.. Multiple sensors (Temperature sensor, flame sensor) are used to the accurate results to reduce the false alarm rate. Four parameters are used as input, such as the change rate of temperature, the change rate of humidity, the presence of a flame, and time. The system will alert people if any unwanted situation occurs anywhere. The proposed work also discards the false alarm rate. Simulation work is done in the MATLAB Fuzzy Logic toolbox and satisfactory results are discussed in this paper as well.

Development of System for Early Fire Detection using Arduino UNO

AUTHOR: Digvijay Singh et al.(2017)

This system presented the development of a fire alarm system using the Arduino UNO. This system undoes the need for a person to continuously monitor the area. The monitoring will be done with the help of sensors. Buzzer and Message alerts are used to alert the required authorities. This system is low cost, power efficient, and based on reliable and durable instruments. Many future works are also possible in this system design. We can use the multiple nodes for a single receiver node. GPS module could also be used to pinpoint the exact position of the fire. We can use the wind sensor to determine the rate of fire flow and its direction. An automated fire extinguishing system could be used along with the system. This system is developed to implement the knowledge gained during the engineering program.

COMPARATIVE ANALYSIS OF LITERATURE SURVEY:

S.no	Year	Researcher	Title	Methodology	Remarks
01	2021	Ravindra Koggalage , Manjula Welihinda, Hasitha Nuwan3	GSM-BASED SMART FIRE AND HIGH- TEMPERATURE DETECTION SYSTEM	MQ5 Gas sensor, GSM, Arduino ATmega328	Indicating fire through SMS Alert using Gas Sensor
02	2019	J Olivares- Mercado	Early Fire Detection on Video Using LBP and Spread Ascending of Smoke	LBP (Local Binary Pixel)	Thus, the smoke detection method using an image from video sequences has been identified
03	2019	Park J.H., Lee S., Yun S., Kim H., Kim W.T.	Dependable Fire Detection System with Multifunctional Artificial Intelligence Framework	Adaptive fuzzy algorithms and Multifunctional AI framework - Fire Detection System (MAI- FDS)	The highest accuracy of Fire Detection has been achieved using MAI
04	2019	Bao Y., Huang Y., Hoehler M., Chen G.	Review of Fiber Optic Sensors for Structural Fire Engineering	Fiber optic interferometer sensors, Long- Period Fiber Grating (LPFG), Fiber Bragg Grating (FBG)	Identified the Characteristics sensor in Fire detection.
05	2018	Sarwar B., Bajwa I., Ramzan S., Ramzan B., Kausar M.	Design and Application of Fuzzy Logic- Based Fire Monitoring and Warning Systems for Smart Buildings	MATLAB, Fuzzy logic	Fuzzy logic technology is used to detection of Fire
06	2017	Digvijay Singh, Neetika Sharma, Mehak Gupta, Shubham Sharma	Development of System for Early Fire Detection using Arduino UNO	GSM (Global System for Mobile Communication), Arduino UNO, LIDAR (Light Detection and Ranging), AVHRR (Advanced Very High-Resolution Radiometer)	Indicating Fire detection place using Gps with MQ5.