IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 9, September 2024

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.625

© 2024 IJIRCCE | Volume 12, Issue 9, September 2024| DOI: 10.15680/IJIRCCE.2024.1209030

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.625| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Automatic Railway Train Safety System

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ABSTRACT: Train transport plays an major role in everyone's life. So people's expectation will be a safe journey. Train journey will be more comfortable than any other means of transport, so most of the people prefer travelling through train. Fire accidents may occur at unexpected situations in train and so handling those problems will be difficult to humans. In thispaper, we introduce automatic fire detection and rescue system based on Temperature Sensor Network technology to monitor continuously and observe the range of temperature and gas from respective sensors. When the fire is detected, the information gathering unit reports the monitored information to the surveillance center via Global System for Mobile Communication (GSM) and necessary help is arrived at the site.

KEYWORDS: GSM, Temperature Sensor, Gas sensor.

I. INTRODUCTION

Automatic Railway Safety System can sense the presence of fire and smoke and generate a series of alarm driven events after it. When the fire is detected it turns on a motor which is depicted in the project as breaking system or chain pulling mechanism. Thus by this the train can be stopped and the passengers and other payloads can be safeguarded there after. Along with breaking, the system sounds a buzzer that would alert nearby people around it so that they can be cautious about the presence of fire in the Train. Also, an SMS is sent to the Railway Authorities which will help them to take quick decisions to take control of the fire and in evacuating the passengers.

II. METHODOLOGY

- Microcontroller: The core of the system that controls all other components.
- Sensors: Detect fire and smoke.
- Alert application: Sends alert messages to nearby control rooms and loco-pilots.
- Fire detection: When fire is detected, the system turns on a motor to activate the breaking system or chain pulling mechanism.
- Alerting: The system sounds a buzzer to alert people nearby and sends an SMS to railway authorities.
- Rectifier: A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction.
- Transformer: A transformer is a device that transfers electrical energy from one circuit to another. Mutual induction connects two circuits. It is also utilized for electrical power transmission via electromagnetic induction. Electric power is transferred without even any frequency modification.
- Motor Driver: Motor drivers have a few different functions, such as amplifying electrical signals to power and control the motor, enabling precise speed control, and feature robust protections, such as over-current protection (OCP) and over-temperature protection (OTP).
- DC Servo Motor: A DC servo motor is a specialized type of motor that delivers precise control over angular or linear position, velocity, and acceleration. The function of the servo motor is to convert the control signal of the controller into the rotational angular displacement or angular velocity of the motor output shaft.
- Regulator ic: 7805.

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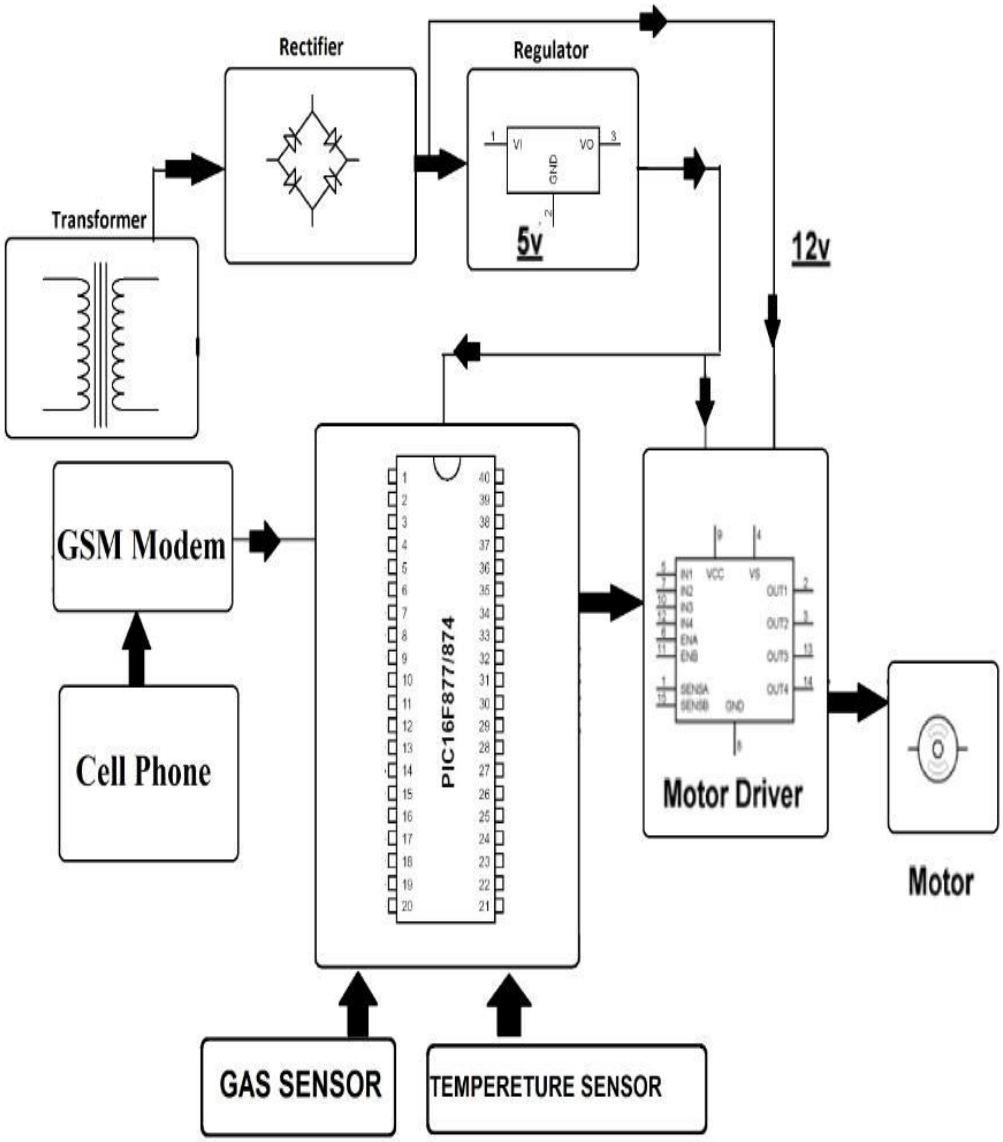

III. FUTURE SCOPE

- Predictive maintenance: Sensors and machine learning to predict and prevent equipment failures.
- Train localization using GPS: Accurate positioning of trains in real-time to avoid accidents.
- Smart signaling systems: Adaptive signaling to improve efficiency and reduce human errors.

IV. CONCLUSION

Thus this proposed system helps to prevent fire accidents in train and passengers can have a safe journey. This system may detect fire using wireless sensors and transmits message to the engine driver about the fire through GSM module and he may stop the train.

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INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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