IJIREEICE

ISSN (Online) 2321-2004
ISSN (Print) 2321-5526

International Journal of Innovative Research in
Electrical, Electronics, Instrumentation and Control Engineering

Vol. 9, Issue 2, February 2021

DOI 10.17148/IJIREEICE.2021.9206

REAL TIME FUEGO DETECTION SYSTEM

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Abstract: Fire Detectors play a very important role in Industries, shops, Malls etc. They help in detecting fire or smoke at an early stage and can help in saving lives. In this project we designed Computer vision - based fire detection. In this model we use a webcam which is used as an alternative for surveillance cameras. If a fire is detected, alarm rings to alert people in that particular area and also a short duration of the live video is sent to the security of the building or the remote fire station through wireless LAN. Thus, the fire station could act immediately. In the Existing system they use a MATLAB tool for processing. In this project we use Open CV for processing, and its processing time is less. Using this project we can able to detect fire at early stage and can help the peoples. To avoid using sensors in fire detectors, false alarms can be avoided. By using this method, we can identify the number of people caught inside the room can be checked and rescuers

Keywords: Open CV, Fire detection ,Image processing ,False alarm

I. INTRODUCTION:

With the development of economy, the number of large high buildings is increasing. Generally, for the complex application, high load of fire and intensive staff, major property damage and heavy casualties will be easily caused if fire happens in these places, and has a bad social impact. So difficult technical problems of fire detection and alarm are urgently be solved to obtain more valuable time for extinguish and evacuation. In large rooms and high buildings, conventional fire detectors can hardly detect characteristic parameters of fire like smoke, temperature, vapor and flame in the very early time of fire, and cannot meet the demand of early fire detection in these places. Compared to conventional fire detectors, video fire detectors which have many advantages, such as fast response, long distance of detection, large protection area et al, are particularly applicable to large rooms and high buildings.

OBSERVATION OF THE STUDY:

we designed computer vision-based fire detection . In this project we use a webcam which is used as an alternative for surveillance camera. Our proposed system is one such monitoring technique that will be easy yet equally effective to implement. Open CV processing time is very less. In the existing system they use a MATLAB tool for processing which will cause false alarming it leads to unnecessary turbulence among people in and around the fire examining the area. Arduino controller and gas sensors is also used which is more cost to implement and hardware connections may loose sometimes .Fire detectors play an important role in industries, shops, malls etc. They help in detecting fire or smoke at an early stage and can help in saving lives. By using this project we can able to detect fire at early stage and identify the number of people caught inside the room can be checked and rescuers.

In this project we use HSV algorithm. HSV (Hue,Saturation,Value)-Hue is the identity of a color as it relates specifically to the spectrum. Saturation is the purity of color. Value is the lightness or darkness of a color. Background separation technique is used for object tracking. It is technique is for detecting moving objects from static cameras. The main advantage of this project is to avoid using sensors in fire detectors, false alarm can be avoided and identify number of people inside the room can be checked.

II. REVIEW OF LITERATURE

2.1 MD SAIFUDAULLAH BIN BAHRUDIN, ROSNI ABU KASSIM, (2013) "DEVELOPMENT OF FIRE ALARM SYSTEM USING RASPBERRY PI AND ARDUINO UNO

The proposed Fire alarm system is a real-time monitoring system that detects the presence of smoke in the air due to fire and captures images via a camera installed inside a room when a fire occurs. The embedded systems used to develop this fire alarm system are Raspberry Pi and Arduino Uno. The key feature of the system is the ability to remotely send an alert when a fire is detected. When the presence of smoke is detected, the system will display an image of the room state in a webpage. The system will need the user confirmation to report the event to the Firefighter using Short

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Message Service (SMS). The advantage of using this system is it will reduce the possibility of false alert reported to the Firefighter. The camera will only capture an image, so this system will consume a little storage andpower.

2.2 RAJESHKUMAR KALLUR, PROF. ROHINI KALLUR, (2016) "FIRE DETECTION WITH A WIRELESS VIDEO CAMERA USING MATLAB

This project focuses on optimizing the flame detection by identifying gray cycle pixels of the flame, which is generated because of spreading of fire pixel and the area spread of flame. These techniques can be used to reduce false alarms along with fire detection methods. The novel system gives optimized way to detect the fire in terms of less false alarms by giving the accurate result of fire occurrence. The strength of using video in fire detection is the ability to monitor large and open spaces. The novel system also give the opportunity to adjust the system by applying different combination of fire detecting techniques which will help in implementation of system according to different sensitive area requirement.

III. PROBLEM STATEMENT AND PRELIMINERIES

In MATLAB tool for processing which will cause false alarming it leads to unnecessary turbulence among people in and around the fire examining the area. Arduino controller and gas sensors is also used which is more cost to implement and hardware connections may loose sometimes. In this model we designed computer vision-based fire detection .In this project we use a webcam which is used as an alternative for surveillance camera. Our proposed system is one such monitoring technique that will be easy yet equally effective to implement. Open CV processing time is very less.

3.1 Block Diagram of the Proposed System:

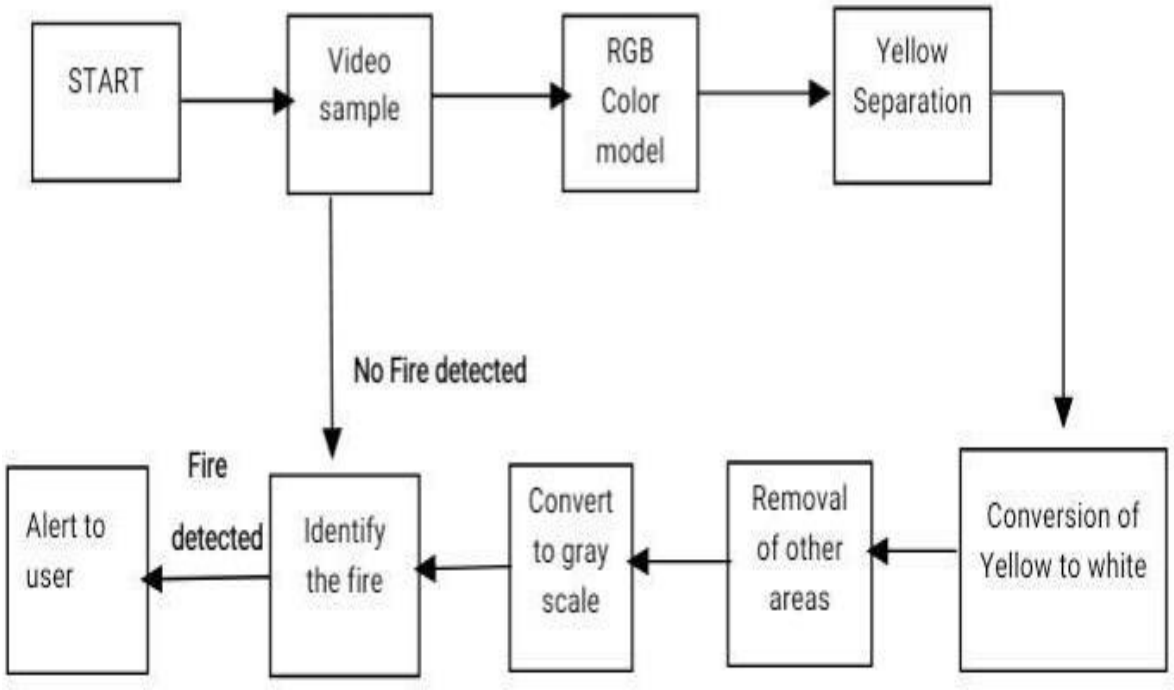

Fig 3.1 Block Diagram of Proposed system

3.2 Flow Diagram of the Proposed system:

The flow chart explains the working of the system. Firstly the video is fed through the webcam, and the video is then forwarded into Raspberry Pi for processing. It will use a cascade classifier to compare the image which is available in the classifier. If a fire is detected, the code will execute, and there will be the fire alert message, and if a fire is not detected, then the system will continue; there will be no alert of fire. The system stays in the same loop until the fire is detected in particular place

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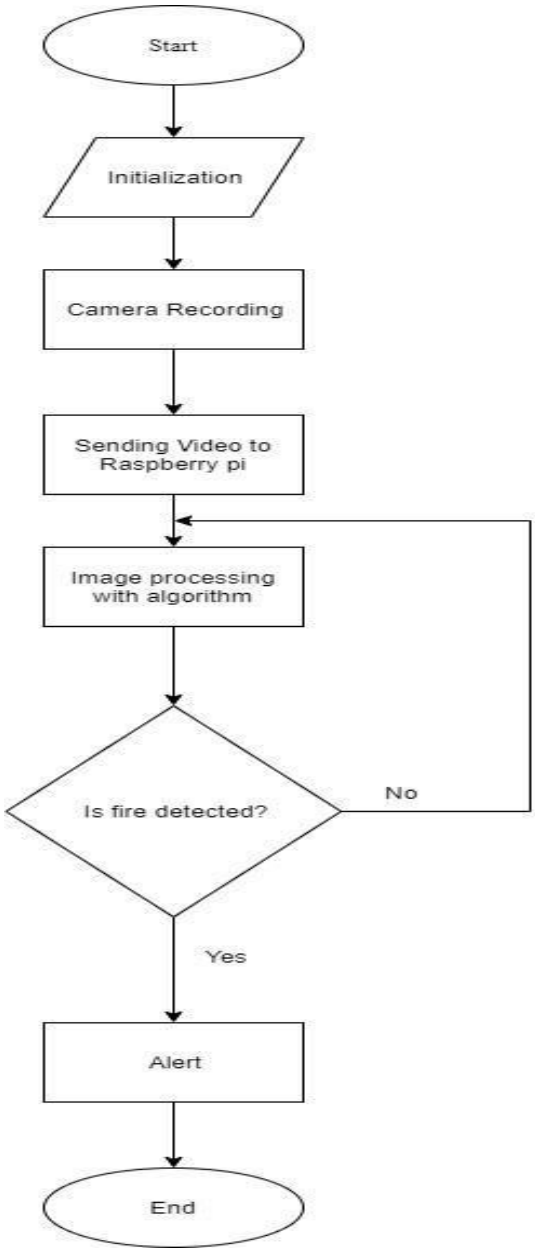

Fig 3.2 Flow Diagram of Proposed System

IV. RESULT OF THE STUDY:

The result of the system of the proposed system and the design is shown below.

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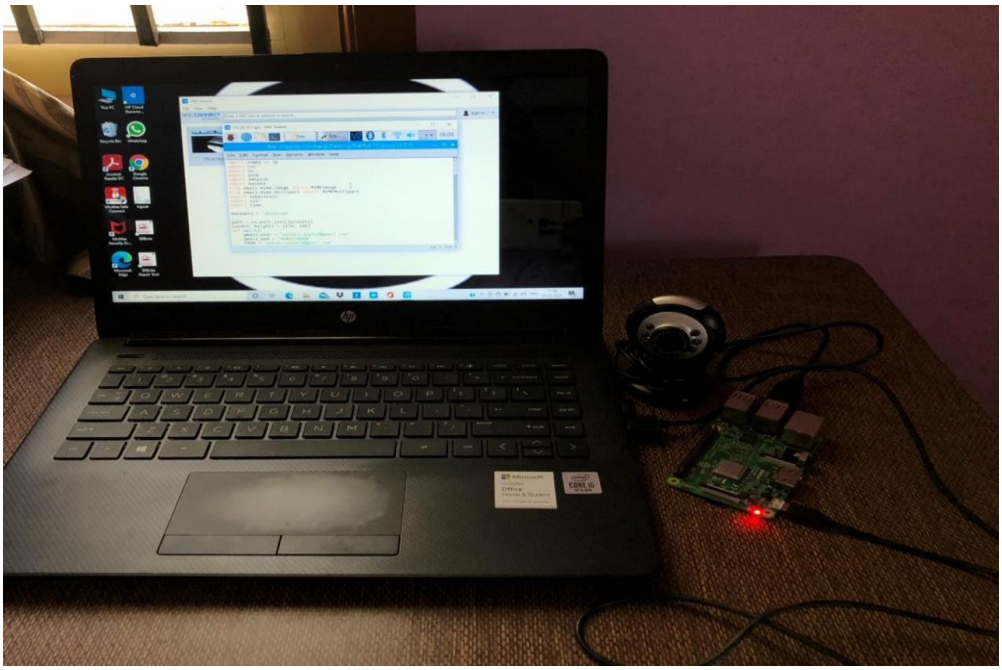

Fig 4.1 proposed system

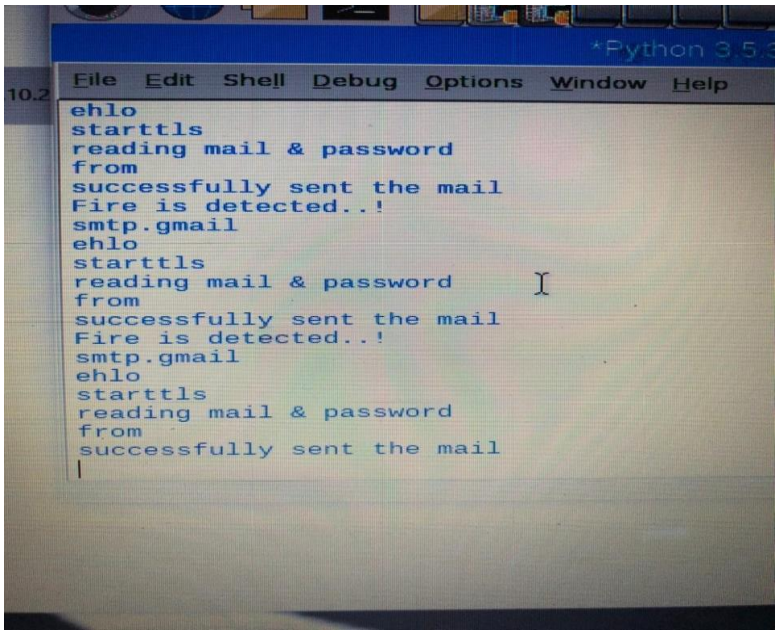

Fig 4.2 output of proposed system

V. ADVANTAGES:

Using this project we can able to detect fire at early stage and can help the peoples. To avoid using sensors in fire detectors, false alarms can be avoided. By using this method, we can identify the number of people caught inside the room can be checked.

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VI. CONCLUSION:

In this project we use Open CV for processing, and its processing time is less. The existing systems will cause false alarming. It leads to unnecessary turbulence among people in and around the fire examining the area. Our proposed system is one such monitoring technique that will be easy yet equally effective to implement. After the completion of the code and installed in the Raspberry Pi, the fire was detected.

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