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Fire Fighting Robot using Image Processing

Dhiraj Kumar[1], Deepak Kumar Diwedi[2], Manish Singh[3], Umakant Thakur[4], Aman[5], A. Sunil[6], Akanksha Kumbhaj[7]
[1, 2] *U.G. Student of EEE Dept, RSR RCET Bhilai, CSVTU, India.*
[7] *Professor of EEE Dept, RSR RCET Bhilai, CSVTU, India.*

Abstract: ***In today's world we discover it's necessary to own a fire extinguisher in each building in line with the norms of state. however once there's fire breakout there's chaos and confusion of either vacating the realm or turning on the fire extinguisher on and ending the fire. conjointly correct training should be given to the staff or personal residing within the building so as to turn on the extinguisher. thus we have come up with a system which might find the fire automatically and directly activate the extinguisher on its own. we'd be inserting camera at varied location within the building or field. using camera we'd be detecting the fire using image process. For higher accuracy we are using smoke and temperature sensors. We are developing an intelligent system by which can detect fire. For doing this first we need to train the system to identify fire. Using advance color recognition algorithm we would be training the system to identify fire. Once the system has learnt to identify fire it can easily detect the fire on its own and turn on the extinguisher on its own. Also the system would check the intensity volume of fire break and accordingly would sent alert to the fire brigade which currently has to be done manually.***
Keywords: RGB Color model, YCbCr color model, motion detection background subtraction, area dispersion

I. INTRODUCTION

Automatic fireplace detection systems use physical sensors to detect and response of an fireplace. The physical sensing element uses the chemical properties within the air area unit nonheritable by sensing element and use by fireplace detection system to boost an alarm. this will conjointly cause false alarms, The physical sensors are not applicable for outside surroundings and in giant infrastructure settings like craft hangers, giant tunnels. as a result of the speedy development of photographic camera technology and advanced content based mostly image and video process , there's a significant trend to interchange standard fireplace detection system with laptop vision based mostly system.

In vision based mostly fireplace detection system, there are 3 major options for fire: Color pixel, moving pixels and form. the hearth pel are often classified as each in gray scale and color video sequences. Most of the hearth detection system works on color video sequences. it's assumed that the image capturing device produces its output in RGB color format, and these color data is employed as a pre- process step. throughout an occasion of fireside, smoke and flame are often seen. because the fireplace intensity is will increase smoke are visible. an honest color model choice for fireplace pel detection and moving pel detection play the essential role in laptop vision based fireplace detection system. the mixture of color and motion clues wont to find the fire.

II. RELATED WORK

Fire flame detection is a very important issue that is related to human life and social security. Image processing primarily based system does quick detection, as human eyes do, counting on camera. Four ways in which to put out a fire - Cool the burning material - Exclude chemical element - take away the fuel - Break the chemical process [6] nowadays most of the fireplace detection systems are supported on detecting smoke, gas and flame and rely upon sensors. but sensors don't seem to be sensible factor to try and do this job owing to its speed. It depends on distance between fireplace space and detector location. Earlier systems were based mostly solely on detector. Flame colours used to notice fireplace are represented by Wenhao and Hong extracted flame objects by unvarying adaptive techniques, then used fireplace flame color as a vicinity of characteristic info analysis to notice fireplace. Juan et al.[4] planned the analysis and extraction of fireside flame colours within the RGB – color house. Celik and Demirel [5] used YCbCr color house to separate light from chrominance. it's potential for a false detection if solely color characteristics are used.

III. ARCHITECTURE DIAGRAM OF SYSTEM

The block diagram of Automatic Fire Detection using GSM and image Processing consists of the following blocks 1. Flame detector 2. Temperature detector 3. Microcontrollers 4. Temperature detector

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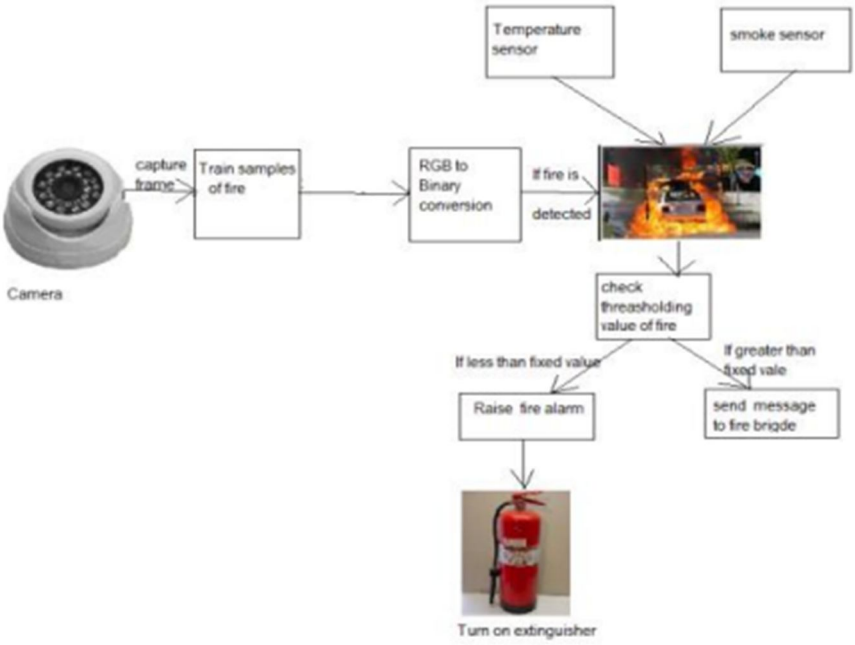

Figure:1 (a) SYSTEM DIAGRAM

IV. FLOW CHART OF SYSTEM DIAGRAM

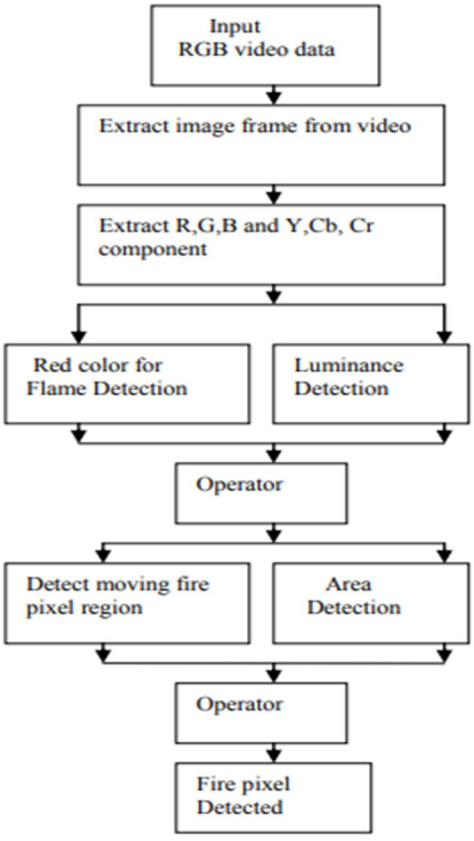

Figure:2 (a) FLOW CHART OF SYSTEM DIAGRAM

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V. RESULT AND CONCLUSION

In this paper, we have a tendency to adopt technique of fire detection supported image process and sensors. This analysis is concerning the developing the automated fire detection using the RGB color model . The declared methodology is beneficial for detective work hearth mechanically and delay it mechanically i.e. while not manual facilitate the System delay the fire.

In this paper a picture primarily based fire detection system was projected, that is primarily based on pc vision based techniques. we've collected variety of successive frames from original video, that consists of fire and non fire pictures. The planned methodology consists 3 main stages: - hearth element detection using RED and YCbCr color model, moving element discovering and analyzing form of fireplace} coloured elements in frames to detect fire pixel in image. The planned methodology is applied on video sequences then fire is detected. Texture or form data alternative then space are often accustomed improve system's hearth detection performance. The performance of fireplace element are often additionally improved by applying smoke detection within the early stage of fire, together with the fire detection technique

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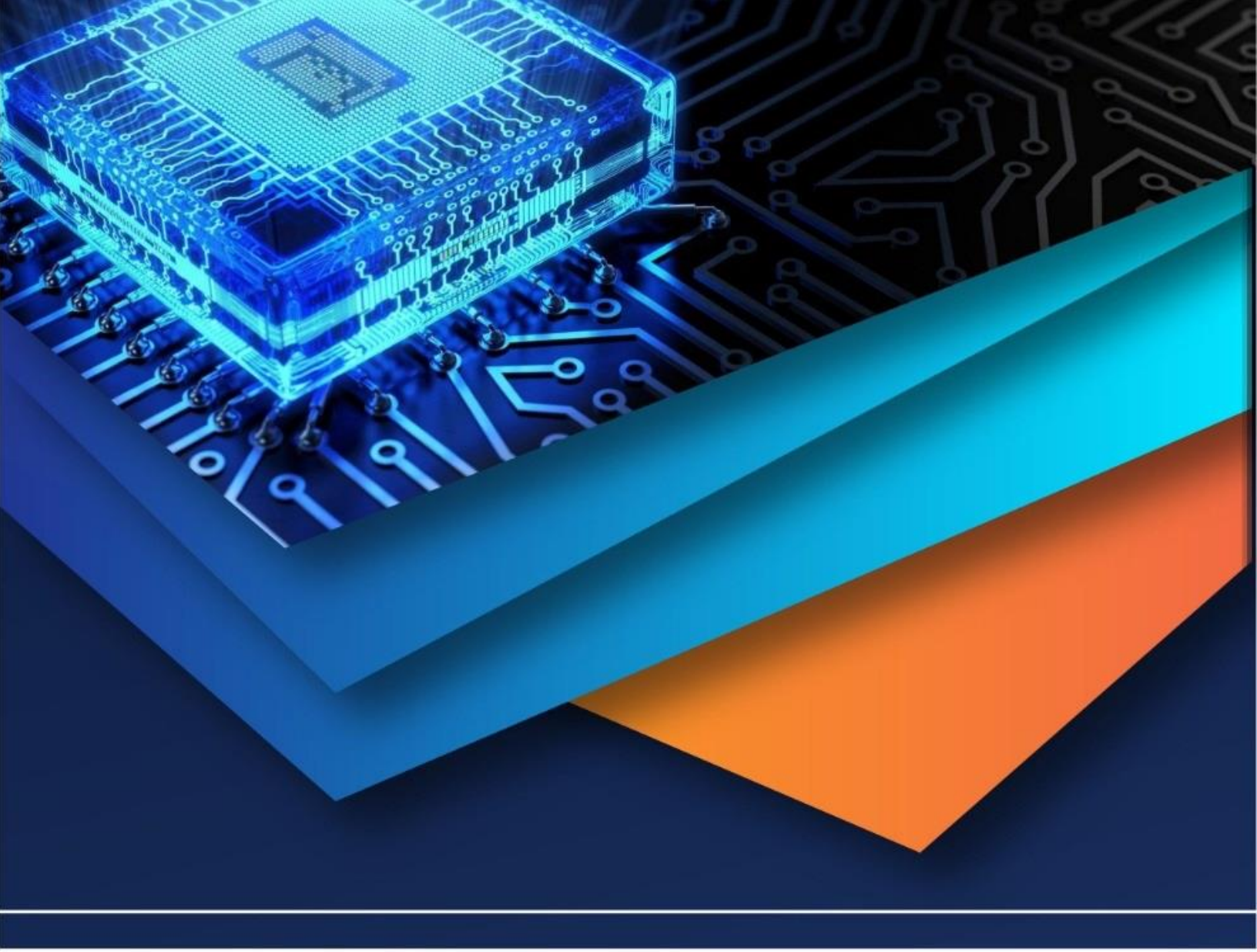

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