

AN EFFICIENT SURVEY ON FIRE DETECTION SYSTEM USING VIDEO SURVEILLANCE

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1. Abstract:

The purpose of fire detection is to prevent residential because fire can lead to significant mental stress in addition to possible physical injuries. Every year lot of money in property destruction occurs as a result of fire. Fire accidents can cause death because of burns, smoke inhalation and toxic gasses. The solution for unwanted fire is fire detection using surveillance camera this system is basically designed to warn occupants of fire so that occupants may safely evacuate the property. The system is important in providing resider of building instant warning when fire occurs. The main intention of this proposed system is to minimize the false detection of the fire and to increase the effectiveness of the model of fire detection for indoor and outdoor scenes. Tools used for this paper are primary or secondary web camera for live video streaming. Secondary memory device is uses for reading input image and saving the outputs image. Methods used are fuzzy logic, color, shape, motion identification. Different algorithms Are threshold images, variance ratio, frame temporal difference. To avoid disk memory this submitted system saves the images only when fire detects. One camera is used for this submitted paper.

2. Keyword: Color, Shape and Motion, Image processing, Fuzzy logic and Fire detections.

Introduction

Fire alarm systems have become more practical and functionally, reliable and stable in recent years. They are designed to complete to general requirements protection of property and protection of life. As a result of states and local codes, the life safety

Accepted for a fire protection has become a major factor in the last two decades.

In many previous papers[2][3],there are many technologies are invented for fire detection which is smoke detection, fire detection using many technologies etc, but there is one drawback that it can give false alarm too. So there is the invention of fire detection. It has many advantages over many alarms like it takes snapshots randomly and decides that flames are very much or not. The basic concept of fire detection using video surveillance is come from the fact that other methods of fire detection like sensors and all always need high implementation and resource cost. And it is always having proneness of producing wrong alerts, So Proposed system put forwards an idea of detecting fire using its color, Motion and shape which is powered with fuzzy logic for providing more accuracy.

Diagram:-

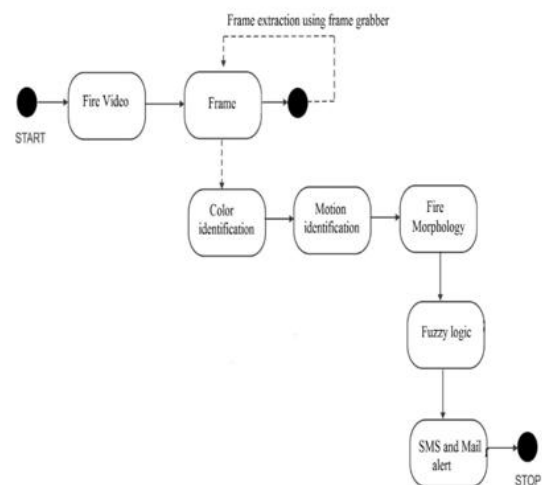


Fig .1. State Transition diagram

And also, proposed systems normally detect fires according to three features: color, motion, and shape. In particular, the color and motion features are often

combined to provide reliable fire detection results. Adopted an RGB (Red, Green and Blue) color model and dynamically analyzed the disordered characteristic of flames to verify the occurrence of fire. An algorithm which combined motion and color features with fire flicker analysis in wavelet domain to detect fire in vide, designed a real-time fire detector that made use of an adaptive background subtraction algorithm to extract foreground information and a statistical fire color model to check fire existence.

Even a strict classification of the methods is not simple, three main classes can be distinguished, depending on the analyzed features: color based, motion based and shape . The methods using the first kind of features are based on the flame, under the presumption that it is formed by common flammable as wood, cotton, paper or other, can be stably differentiated by its color, so that the interpretation of the color components (in RGB, YUV or any other color space) is sufficient to identify the existence of flames.

The video clips used in our experiments are real-world image sequences taken from a random selection of commercial / training video tapes. They include different types of fires such as residential fire, warehouse fire, in this proposed paper use images captured at day time, dusk or night time to examine system execution under many light effect.

In fire detection there is surveillance camera which detects fire by taking snapshots. These Snapshots are the input which stored in storage devices like hard disk and these inputs decide that how much amount of fire is there. The inputs are in the form of photos, snapshots are sends via messages or email to users or owner. For sending purposes there is a Wi-Fi network. In system there are already phone number of users and email - id and fire brigade number are have to save.

Fire has distinct, multiple signs, several of which have been used to design different methods for its detection. Most of the methods can be categorized into smoke, heat, or radiation detection. Each fire detection method is better suited to a distinct environment. Vision based fire detection has the

following advantages over the other methods. First, it has fast response to fires. Like the radiation based method, it detects fires as soon as they appear in sight. Second, it directly senses the location of fire, not just radiation which comes from its general vicinity.

Architecture:-

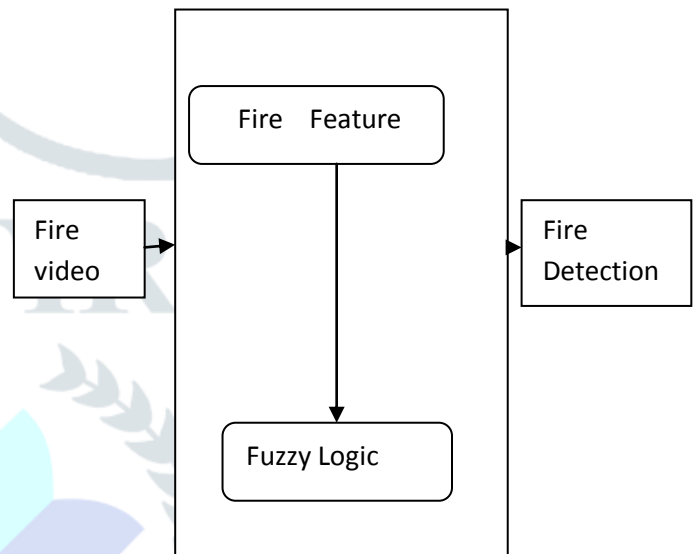


Fig.2. - level 0 DFD

3. Literature survey:

This section of literature survey eventually reveals some facts of Survey on Fire detection using three factors methodology based on their analysis of many authors works as follows

1. In Online Detection of Fire in Video B. Uğur Toreyin, A. Enis C, etinBilkent University 06800 Ankara Turkey paperit proposed a method which able to detect fires by analyzing the videos acquired by surveillance cameras. It based on color, shape and motion analysis, are combined by a advance system. The approach has been tested on a wide database with the aim of assessing its performance both in terms of sensitivity and specificity. Starting from this collection, composed by frames, it added several long videos acquired in both indoor and outdoor situations so resulting in a new dataset composed by 62:690 frames and more than one hour of recording. This simple idea proposes many recent methods: for instance, fire pixels from frame are recognized by a well-known background

subtraction technique and a “statistical RGB color model” a set of images always used and a region of the color space has been analytically defined, so that if a pixel belongs to this particular frame, then it can be classified as fire. In this paper drawback is it consumes lot of memory on hard disk.

2. In Wireless Fire Detection Monitoring System for Fire and Rescue Application Muhammad Salihin Ahmad Azmil, NorsuzilaYa’acob, Khairul Nizam Tahar, Suzi Seroja Sarnin it consists of weak organizers based on secular and specific modeling of fire.HMM based secular fluctuate modeling of fire and wavelet based lineament modeling approaches are used as weak classifiers. A weighted-majority based method is utilized for online learning. It also issues false alarms for moving fire-colored objects exhibiting periodic motion such as rotating ambulance lights in a tunnel and their reflections from the walls. An important drawback of point detectors is that they are distance limited and disable in open or big spaces.

3.Flame object segmentation by an improved frame difference method Chen Ning, Ding FeiJiangsu University of Science and Technology, Zhenjiang, Jiangsu, 212003, China with fluctuation in demands, the Fire and Rescue Service must equip with the best techniques, training regime and equipment to meet public expectations. All the data taken from smoke sensor and camera will be send to data monitoring system and be display on monitoring system wirelessly. Wireless Fire Detection prototype will send all the sensor data to the monitoring system wirelessly by using the wireless module. Wireless Sensor Network can be the most useful way to collect various parameters and all the information needed by environments such as in industrial, shipboard, home, building, utilities and transportation system automation. Color probability density of fire pixels. Experiments show that our algorithm detects fire with high accuracy, both in single images as well as in image sequences. The objective of this work is in the general context of modeling and recognizing shape evolution in stochastic visual phenomena. In particular, this paper focuses on detection of fire in image sequences.

Conclusion:-

This paper analyzes various mythologies involve in fire detection system using video surveillance method. After analysis, this paper finds some fact that only one factor is not enough to identify the fire from the videos, so minimum of three factors is required like color, shape and motion for fire

detection. And this paper finally comes to a conclusion of using these three factors with fuzzy classification technique to identify the fire which will be appear in the next edition of our research.

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