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Fire Detection and Localization Using Web Camera

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ABSTRACT: Design and Implementation of Fire Alarm Circuit combinational digital circuit which can perform an alarm by the voice signal. This project detects smoke using Light Dependent Resistor & Light Emitting Diode. Normally speakers have no alarm but when smoke detects then alarming. The project is based upon a major approach to control and secure homes, office, shop, markets, and University, etc. For the fire alarm, the main circuit design used (ISIS) software, and the circuit was finally implemented on a breadboard.

KEYWORDS: CNN, Tensorflow, Artificial Neural Network (ANN)

I. INTRODUCTION

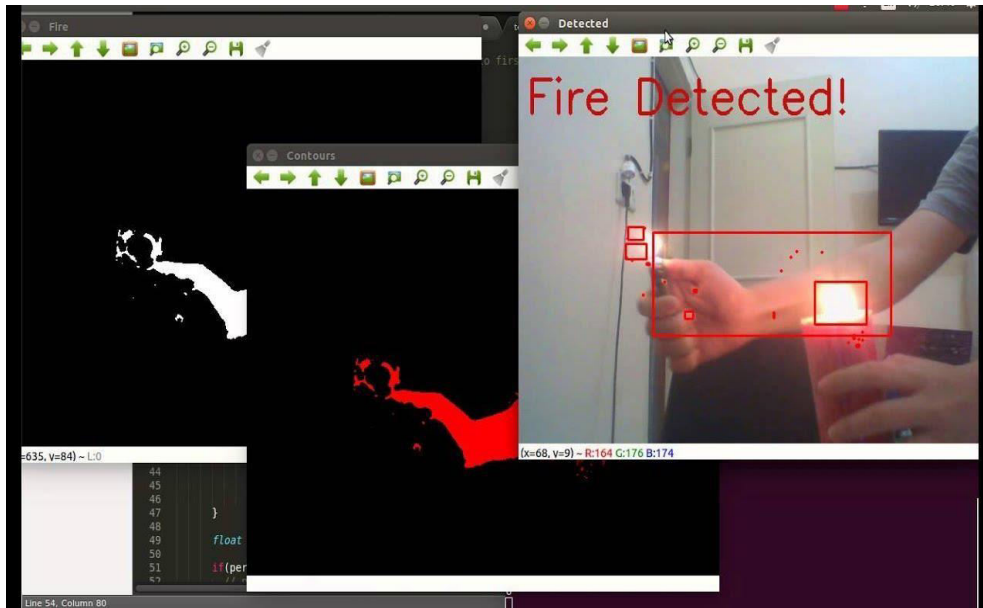
A fire alarm system has several devices working together to detect and warn people through visual and audio appliances when smoke, fire, carbon monoxide, or other emergencies are present. These alarms may be activated automatically from smoke detectors, and heat detectors or may also be activated via manual fire alarm activation devices such as manual call points or pulsations. Alarms can be either motorized bells or wall mountable sounders or horns. They can also be speaker strobes that sound an alarm, followed by a voice evacuation message which warns people inside the building not to use the elevators. Fire alarm sounders can be set to certain frequencies and different tones including low, medium, and high, depending on the country and manufacturer of the device. Most fire alarm systems in Europe sound like a siren with alternating frequencies. Fire alarm electronic devices are known as horns in the United States and Canada and can be either continuous or set to different codes. Fire alarm warning devices can also be set to different volume levels. Manually actuated devices; also known as fire alarm boxes, manual pull stations, or simply pull stations, break glass stations, and (in Europe) call points. Devices for manual fire alarm activation are installed to be readily located (near the exits), identified, and operated. They are usually actuated using physical interaction, such as pulling a lever or breaking glass. Automatically actuated devices can take many forms intended to respond to any number of detectable physical changes associated with fire: convected thermal energy; heat detector, products of combustion; smoke detector, radiant energy; flame detector, combustion gases; fire gas detector, and release of extinguishing agents; water-flow detector.

II. RELATED WORK

The answer to that question is two answers because there are two quite different kinds of smoke detectors. One is a kind of electronic eye; the other's a sort of electronic nose. The eye type of detector is more properly called an optical smoke detector (or photocell smoke detector) and it works a bit like Tom Cruise in Mission Impossible. Remember the scene when Tom dangles from the ceiling trying to avoid all those light-detecting burglar beams? An optical smoke detector is just like that inside. Let's take a look.

III. METHODOLOGY

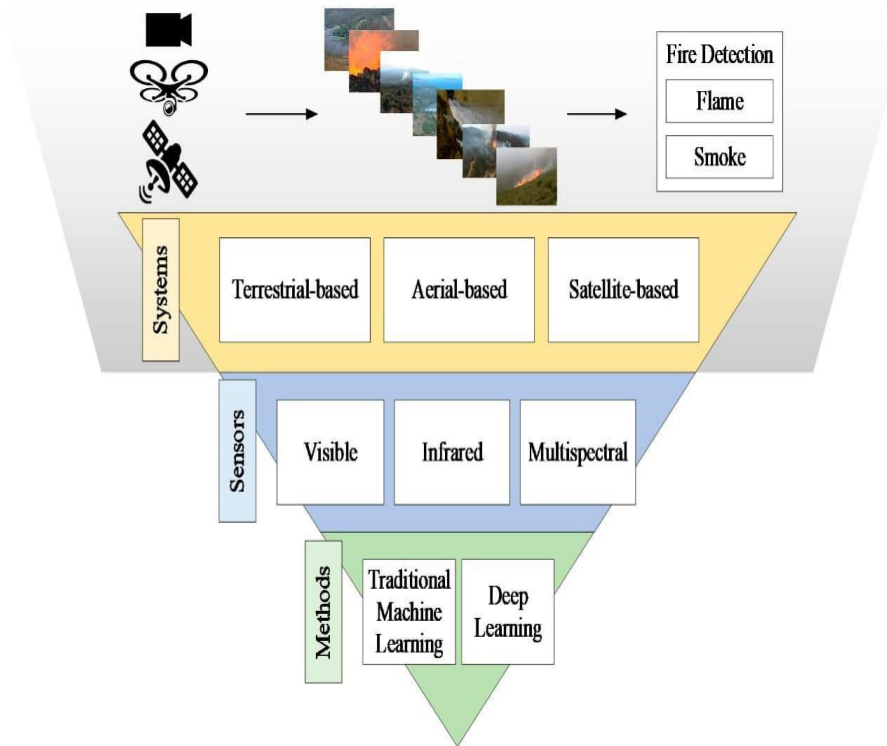
First, we capture each frame displayed by our machine's web camera. In each frame, we define a region of interest (ROI), which is marked by a blue bounded square, as shown in the image below:



The detector must be screwed to your ceiling because that's where smoke heads for when something starts to burn. Fire generates hot gases and because these are less dense (thinner—weigh less per unit of volume) than ordinary air they rise upward, swirling tiny smoke particles up too.



The flow chart for gesture classification is as follows



The Application Working Diagram is as follows:



(Model FR-2000 shown)



IV. CONCLUSION

The developed prototype in this work is made for a user to control the fire alarm system remotely. This helps the user if he/she is not in the building or even unaware of an emergency condition. The use of this prototype will avoid unpredictable situations or any critical situations from occurring in the residential areas without the awareness of the resident. The home alert system is observed to be functional by triggering the fire extinguisher. The use of a coupled sensor of temperature sensor and the smoke detector was found to be more appropriate than the use of only one of them. Though the prototype was able to extinguish the fire the portability can be significantly improved by efficient assimilation of the different modules. This system should also take care that each module of it can be easily replaced by a better sensor and equipment with updated technology.

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