

SYSTEM SECURITY CAMERA

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ABSTRACT

Closed circuit TV systems have recently become an indispensable part of daily life. Cameras are of vital importance as significant elements of security systems in different buildings such as houses, stores and shopping malls. IP technology contributed to the development of security systems which witnessed rapid improvements in terms of smart image analysis. Recent security camera systems with smart video analysis serve a vital purpose. This study focuses on designing a smart security camera system. Security is one of the most important things in our daily lives. Security camera systems have been introduced to keep us safe in shops, airports, downtowns, and other public spaces. Security cameras have infrared imaging modes for low-light conditions. However, infrared imaging sensitivity is low, and the quality of images recorded in low-light conditions is often poor as they do not always possess sufficient contrast and resolution; thus, infrared imaging devices produce blurry monochrome images and videos. A real-time nonlinear signal processing technique that improves the contrast and resolution of low-contrast infrared images and video is proposed. The proposed algorithm can be installed in a field programmable array. Although security issues of distributed smart cameras are analogous to networked embedded systems and sensor networks, emphasis is given to special requirements of smart camera networks, including privacy and continuous real-time operation. Using the concept of IOT and Machine learning this security system camera will recognize human, gives recordings and also user can check the real time surveillance from his mobile and also get notifications through e-mail such that user maybe assured of any theft operation or risk factors going in the house.

Keyword : Internet of things, security system, embedded system, Raspberry pi, Machine learning etc....

1. INTRODUCTION

It is important for a moving observer to be able to identify his/her surrounding objects and determine whether these objects are moving or stationary, which is called object-level motion detection. The object-level motion detection from moving cameras is a difficult problem due to the dual motion introduced by the mixture of the camera motion and the object motion. The paper presents a novel technique that detects object-level motion from a freely moving camera using only two consecutive video frames. A context-aware motion descriptor (CMD) is designed based on the object's moving speed and moving direction relative to that of the moving camera. The CMD descriptor employs the contextual information, e.g. the optical flow of the image background surrounding the moving object of interest, which describes the object motion behavior better than other contexts such as camera's GPS and direction. The inconsistency between the histogram of oriented optical flow (HOOF) of the object and its surrounding background is measured for the object-level motion detection. The proposed technique has been evaluated over two types of widely studied objects, i.e. vehicles and humans that are captured with different sizes, moving speed and image backgrounds by using a moving camera. Experiments on challenging real-world videos show promising performance in object-level motion detection.

1.1 RASPBERRY PI

A Raspberry Pi is a credit card-sized computer originally designed for education, inspired by the 1981 BBC Micro. Creator Eben Upton's goal was to create a low-cost device that would improve programming skills and hardware understanding at the pre-university level. But thanks to its small size and accessible price, it was quickly adopted by tinkerers, makers, and electronics enthusiasts for projects that require more than a basic microcontroller (such as Arduino devices). The Raspberry Pi is slower than a modern laptop or desktop but is still a complete Linux computer and can provide all the expected abilities that implies, at a low-power consumption level.

2. SYSTEM ARCHITECTURE

In this System the raspberry pi which is the main module is connected to an wifi connection and similarly it is attached with camera .Now the process starts as when raspberry pi is connected to the circuit ,the camera is started and starts taking pictures of person coming and sends image ,if the image is of human face then it is send to the cv library otherwise it will send it back to the raspberry pi .When it is human face the raspberry pi then sends it to the open cv library where the faces are converted to square shape .

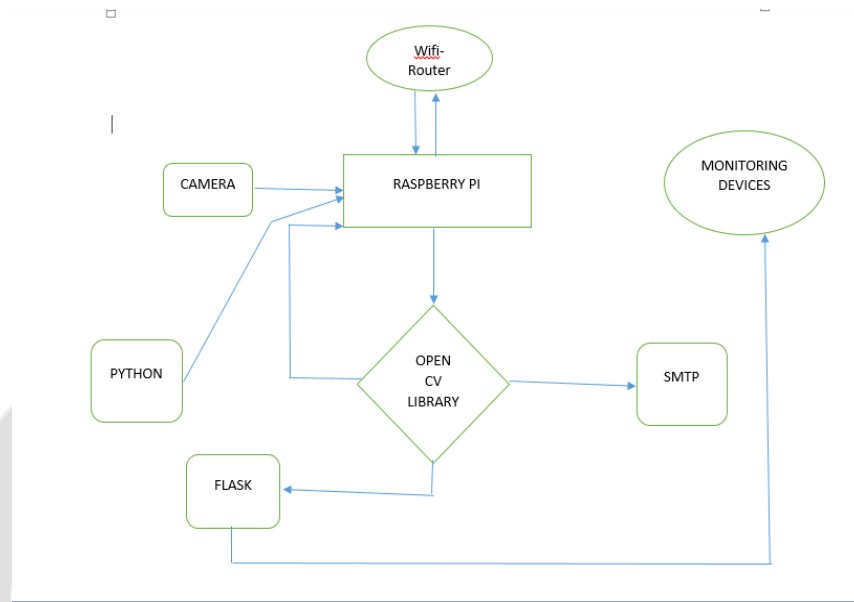


Fig -1:System Security Architecture

The open cv library then sends notification through SMTP(Simple Mail Transfer Protocol) and then with the help of flask library an ip is generated through which we can recognize the face of person.

3. PROPOSED SYSTEM

The proposed System tends to implement the usage of cctv cameras CCTV relies on strategic placement of cameras, and observation of the camera's input on monitors somewhere. Because the cameras communicate with monitors and/or video recorders across private coaxial cable runs or wireless communication links, they gain the designation "closed-circuit" to indicate that access to their content is limited by design only to those able to see it. Older CCTV systems used small, low-resolution black and white monitors with no interactive capabilities. Modern CCTV displays can be color, high-resolution displays and can include the ability to zoom in on an image or track something (or someone) among their feature. The System will not only help to catch thieves but also will also help to reduce theft activity going in society. These type of cameras will also give quick information about whats happening in their house or at their workplace and also

3.1 ADVANTAGES OF PROPOSED SYSTEM

The proposed system has many advantages as it saves lot of memory as it will record only the human faces and will send quick notification to the user through email ,also in previous cameras all the recordings were shown on computer but through this system we can see the recordings from our phone and thus saves time. The System .Also the systems which were used earlier were costlier but these systems are much more efficient and less costly. People in the modern world are moving towards smart technologies and gadgets like these will benefit society and improve the world.

4.SYSTEM REQUIREMENTS

The system requirements include both hardware and software as they are mentioned below:

4.1 Harware Requirements

1)Raspberry pi

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated, selling outside its target market for uses such as robotics. It does not include peripherals (such as keyboards, mice and cases). However, some accessories have been included in several official and unofficial bundles.

2)Camera

A camera is an optical instrument for recording or capturing images, which may be stored locally, transmitted to another location, or both. The images may be individual still photographs or sequences of images constituting videos or movies.

4.2 Software Requirements

1)Python language

Python is an interpreted high-level programming language for general-purpose programming. Created by Guido van Rossum and first released in 1991, Python has a design philosophy that emphasizes code readability, notably using significant whitespace.

2)Open CV Library

OpenCV (Open Source Computer Vision Library) is released under a BSD license and hence it's free for both academic and commercial use. It has C++, Python and Java interfaces and supports Windows, Linux, Mac OS, iOS and Android.

3)Flask Library

Flask is a micro web framework written in Python and based on the Werkzeug toolkit and Jinja2 template engine. It is BSD licensed. The latest stable version of Flask is 0.12.2 as of May 2017. Applications that use the Flask framework include Pinterest, LinkedIn, and the community web page for Flask itself.

5. CONCLUSIONS

This is the biggest and the most obvious benefit of installing security cameras. Once they are placed, you will be able to see their effect on people almost immediately. Even if they are placed discreetly, you will start feeling a sense of security, which is priceless. Real cameras, on the other hand, are extremely helpful as they enable you to monitor the activities of people visiting your home and office as well as the goings-on at these places. This is a great way to detect suspicious people and keep tabs on their activities.

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