INTELLIGENT SURVEILLANCE SYSTEM FOR SECURITYAND ECO SURVEILLANCE

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Abstract

Wireless sensor networks emphasize in most of the real world applications such as military applications, medical field and home appliances and so on. Sensors used in such applications do not provide any confidentiality, however it is been used in almost all the areas in our day-to-day life. In particular, this work proposes an intelligent surveillance method that provides object tracking and activity monitoring are some of the important issues for a home-care robotic system. In this project, smart-phone and webcams with microphone are adopted to provide a perfect surveillance service of the indoor and outdoor scene and noise. Some basic functions for smart living and elderly care, such as motion detection, noise detection, object tracking and target behavior analysis, are implemented.

For the motion detection, a background model is first created and the Cam Shift background algorithm is used for object tracking by extracting color information of the target and for noise detection minimum DB sound is predefined to detect device surrounding sound. By these two service (motion detection and noise detection) we can get accurate current environment of the device which is working. To make the motion detection and object tracking fully automatic and robust under different illumination conditions, an optical flow approach is cooperated to detect small changes of the mobile object.

Keywords: **Wireless Sensor, Surveillance System, Middleware, Motion Detection, Noise Detection**

1. Introduction

Intelligent surveillance, object tracking and activity monitoring are some of the important issues for a home-care robotic system. In this work, smartphone and webcams with microphone are adopted to provide a perfect surveillance service of the indoor and outdoor scene and noise. Some basic functions for smart living and elderly care, such as motion detection, noise detection, object tracking and target behavior analysis, are implemented.

For the motion detection, a background model is first created and the Cam Shift background algorithm is used for object tracking by extracting color information of the target and for noise detection minimum DB sound is predefined to detect device surrounding sound. By these two service (motion detection and noise detection) we can get accurate current environment of the device which is working. To make the motion detection and object tracking fully automatic and robust under different illumination conditions, an optical flow approach is cooperated to detect small changes of the mobile object.

2. Problem Identification

Human operators sometimes have to monitor many video feeds at the same time but the visual limitations of human being give permission to handle only a small subset. These limitations cause operators to overlook some important actions, requiring more operators to maintain a reliable this intelligent surveillance system. However, the increased number of operators makes the system more reliable but less efficient. The cost of manpower becomes the dominating factor in the total operational cost and it is generally much larger than the costs of software

and storage medium. The increasing demand for security by society leads to a growing need for surveillance activities in many environments. Lately, the demand for remote monitoring for safety and security purposes has received particular attention, especially in the following areas. Transport applications such as airports, maritime environments , railways,. Public places such as banks, supermarkets, homes, department stores and parking lots.

3. Proposed Method

The proposed solution can be applied not only to various security systems, but also to environmental surveillance.

Firstly, the basic principle of involving object detecting is given. Limited by the memory consuming and computing capacity of a mobile phone, a background subtraction algorithm is presented for adaptation. Then, a selfadaptive background model that can update automatically and timely to adapt to the slow and slight changes of natural environment is detailed. When the subtraction of the current captured image and the background reaches a certain threshold, a moving object is considered to be in the current view.

Second thing is noise detection, in specific level of noise (e.g 20db or 10db) depend on location and situation of the place. if any of this is detect the mobile phone will automatically notify the central control unit or the user through phone call, SMS (Short Message System) or other means. The proposed algorithm can be implemented in an embedded system with little memory consumption and storage space, so it's feasible for mobile phones and other embedded platforms, and the proposed solution can be used in constructing mobile security monitoring system with low-cost hardware and equipment's. Based on J2ME (Java2 Micro Edition) technology.

3. Analysis

The rising need for security in the last years has led to an increased use of surveillance cameras in operators with automated systems to monitor and analyze the video data in reasonable time. My proposed system extends the into common active monitoring of camera footage an intelligent automated investigative person-search and walk path reconstruction of a selected person within hours of image data. My system is evaluated and tested under life- like conditions in real-world surveillance scenarios. both public and private areas. The increasing amount of footage makes it necessary to assist human

The existing system consists of a video surveillance systems starts with digital mobile camera systems. The proposed solution can be applied not only to various security systems, but also to environmental surveillance. Firstly, the basic principle of involving object detecting is given. Limited by the memory consuming and computing capacity of a mobile phone, a background subtraction algorithm is presented for adaptation. Then, a self-adaptive background model that can update automatically and timely to adapt to the slow and slight changes of natural environment is detailed. When the subtraction of the current captured image and the background reaches a certain threshold, a moving object is considered to be in the current view.

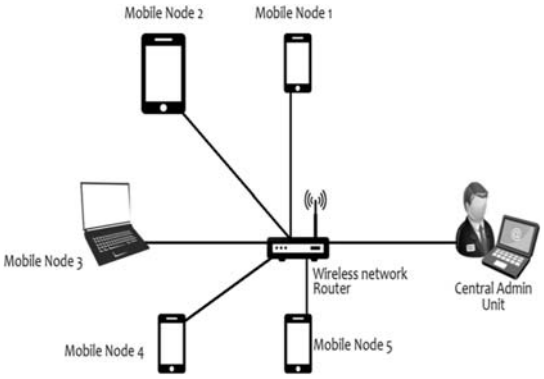
The proposed system consists of video as well as a noise detection. Noise detection, in specific level of noise (e.g 20db or 10db) depend on location and situation of the place. if any of this is detect the mobile phone will automatically notify the central control unit or the user through phone call, SMS (Short Message System) or other means. The proposed algorithm can be implemented in an embedded system with little memory consumption and storage space, so it's feasible for mobile phones and other embedded platforms, and the proposed solution can be used in constructing more security monitoring system with low-cost hardware and equipment's. Based on J2ME (Java2 Micro Edition) technology.

4. Design

In the first part of this thesis, we have stated that technology that can be used to establish a surveillance system that can be used for various security surveillances and eco surveillance system. We also stated a brief introduction on the functionality of the system. In that context we examined existing approaches and adding some improvement to that we presented My purposed system. Surveillance system is the demand of today's robotics and security environment. Limited by their operability, the human operators are not of much efficiency in the surveillance system. so to assist the human operator and to make sure that their operations are reliable, surveillance system is made intelligent in some extend with the features like motion detection and audio/noise detection. Whenever a motion or a noise is detected in the surveillance area, an alert is trigged to the central admin system to take proper action.

Motion detection is done by comparing the pixels of two consecutive frames and highlighting the difference in pixel areas.

Noise Detection is implemented by triggering an alert whenever a noise above the certain threshold is detected around the surveillance device.



The Figure represents the proposed architecture of intelligent surveillance system.

5. Proposed Methods

An Intelligent Surveillance system capable of detecting video motions and audio noises.

Whenever a motion is detected in the environment being surveillance, an alert is triggered.

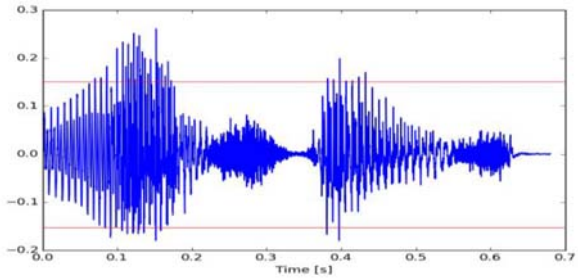
Similarly whenever a noise is detected in the environment the admin control unit is triggered.

5.1 Motion Detection

- System triggers an action upon motion detection.
- Done by Using an effective Algorithm that compares the pixels of previous frame with the new frame for motion detection.
- Various UI option is provided for displaying the motion detected.
- Displays every motion detected even the motions negligible to human eyes.

5.2 Noise Detection

- System triggers an action upon detection of noise.
- Audio noises from the mobile device's microphone are monitored, which if exceeds the certain threshold; A preset action is triggered.
- The threshold in dB can be preset in Admin Control UI.



6. Modules

User-Interface

A Graphical User Interface is designed and presented to both handler and the agent. This interface is presented to provide ease of operation even to those users who barely have computing knowledge. In this screen, the user will get all the information regarding the application process of Handler as well as the User. Admin can access the particular device which they need for their Surveillance operation.

Handler

It is SCU based application through which the admin can get full functional access to the Intelligent Surveillance System. User can change the current setting and some function of the agent which is running on remote system like desktop or smart-mobile phone. Admin can set the motion detection frequency and the minimum threshold for noise detection, can set the trigger action.

Agent

It is a remote application. Different versions of the agent run on the remote systems to monitor the devices (smartphone, tablets and windows OS based devices) for effective video surveillance. This agent runs on the remote device and work like spy. It sends the sound and video after detection of any noise or motion to the SCU (server control unit). There could be numbers of agent depend on the user requirement.

Communication interface

This software will be hosted on a server. The client who is supposed to connect with the

Handler unit needs to get connected with the wireless network, hosted by the server. Then the browser will display the graphical user interface for user interactivity. The forms that are displayed by browser and when gets filled by user are sent to the Handler Unit through wireless communication interface for processing and saving of data in database.

Functional-Requirement

Administrator of SCU can control all the agent's devices through handler that is running on the server unit. Only one handler can control all the spy agents. These spy agents send the video stream and audio stream to the control unit after motion encountered or noise encountered on the agent devices. This agent spy sends the video or audio to compare with the stored data base on the control unit. If the motion is detected; the handler system is alerted through a scripted trigger and the admin will take necessary step in response of the trigger.

4. CONCLUSION

In this paper, the "intelligent surveillance system" security is ensured using sensors in Home/Office and the work proposes an security system which can be great where security is a matter of concern. The motion detector and the noise detector patches up the need for a cheap and small security system in day to day life. Computerized home-based security can develop a lot with the coming future. Future is promising and easier with innovative technologies.

The system presented here is successful as a robust detector of motion and noise detection. However, there is still more progress to be made, especially to handle the shortcomings that are not exercised by the two video sequences used for performance management.

Although this static representation was built using statistic over a certain period of time, the model is a time average of these statistics and inherently cannot contain information about the periodic nature of human gait. Thus, any moving object that has roughly the shape of human and moves with the speed expected of a human will be detected as a human. A second limitation is that of a background subtracted. We make the fundamental assumption that the background will dominate most scenes and will be stationary. This is unacceptable for more crowded environment where surveillance is desired. In addition, the requirement for a stationary background rules out situations where the camera is in motion such as vehicle or robotic cameras.

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