Project overview

There has been substantial growth of interest in Wireless Home Security Systems in recent times. Closed Circuit Television (CCTV) has long been the most popular method used for surveillance purposes. CCTV’s usually involve transmitting signals to a monitor through a closed network from a camera. However they usually require professional installation and can be quite expensive. With the development and growth of smart devices and also wireless networks, there are other methods that have been used for surveillance. Although these home security solutions are cheaper compared to CCTV’s, they are still relatively expensive since they require the purchase of specialized devices.

Smartphones are part of our daily lives and their popularity is fast increasing. This project implements a real time motion detector system and also a speech recognition application for Android smartphones. These two features were implemented by using both the Camera and the Microphone sensors on Android smartphones. The cornerstones of this project are image processing and speech recognition algorithms. This project is a stepping stone towards the implementation of Wireless Home Security on smart devices.

Implementation

The motion detector was implemented using the camera sensor and sends an alert notification on detecting motion. The keyword detector sends an alert notification on detecting the word “Help”.

System overview of the motion detector

- Capture Image
- Obtain Grayscale values
- Image Processing
- Motion Detection
- Notification

System overview of the keyword detector

- Start
- Scan Speech
- Detect Keyword
- Notification

Results

The motion detector was successfully able to detect motion and send an alert notification. The keyword detector was able to perform well in different noise backgrounds and sent an alert notification after detecting the word “Help”.

We tested the motion detector in different light backgrounds such as natural light, dim light, white light.

Upon detection of motion or keyword, the system would be able to send an alert notification via SMS and email.