Using Mobile Phone Sensors for Wireless Home Security Systems

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Introduction

Nowadays, with advances in mobile device technology, and the fact that, newer mobile phones have embedded sensors, more tasks can be performed with these tiny devices. More services can be provided by smartphones. Not only do they allow users to check emails, but also they provide entertainments. If the users get lost, smartphones can locate the location of the users and search for the best way to get to the destination. The functionality of smartphones can be extended by equipping applications which are found online. The advantages of smartphones are that they are handy to carry and popular. Smartphone is an essential item for the daily life of majority of people. The performance of sensors and processors will be influential to the quality of their daily life.

Aim

Develop an Android application for home security system by using mobile phone sensors.

System Block Diagram

- Motion is detected from the image captured by the camera
- Accelerometer sensor inside the phone detects the fall
- GPS sensor detects the user is away from the predetermined location
- SMS and a text alert will be triggered
- Alert generated
- Message will be sent to a predetermined relative with his location

Fig 1. The System Block Diagram

Methodology

- Converted an image from RGB to Grayscale
- Grayscale
- Compared 2 successive image by pixel

Fig 2. Lena in RGB
Fig 3. Lena in Grayscale
Fig 4. Grayscale
Fig 5. Compared image 1
Fig 6. Compared image 2

Notification

- When the differences between two successive images are higher than a threshold value, the application will send an email to users automatically.
- The two images will be attached to the email.

Finalized Product

Fig 7. The starting page
Fig 8. The login page
Fig 9. The Register page
Fig 10. The Main Screen