Using Mobile Phone Sensors For Wireless Home Security System

Project Code: BA1a-11

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Introduction
Smart phones are so common nowadays and many people are using them. People can install apps into their smart-phones to perform different kinds of functions. Android system is one of the common operating systems. By developing a home security system on an Android app, people can easily use it and install it into their smart phones.

In this project, we have designed a home security system that can detect falling, the location and motion of the elderly. It can also detect intrusions. It sends an alert when an elderly person is in danger. This app can help the elderly when they may be facing problems in their day to day living.

Aims and Objectives
- To develop a home security system app for the elderly
- To build a user-friendly interface
- To develop a database for contact person records
- To detect the motion, location and falling of the elderly
- To generate alarms when the defined situations are happened

Hardware

<table>
<thead>
<tr>
<th>Device</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Phone</td>
<td>Sony Ericsson Neo V red Colour</td>
</tr>
</tbody>
</table>

Software

<table>
<thead>
<tr>
<th>Type</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming language</td>
<td>Java SDK 6 Update 34</td>
</tr>
<tr>
<td>Operation system</td>
<td>Android 2.2 API Level 8</td>
</tr>
<tr>
<td>Coding platform</td>
<td>Eclipse SDK 3.7</td>
</tr>
<tr>
<td>Software Support</td>
<td>Android SDK</td>
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<td></td>
<td>Android Virtual Device Manager</td>
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<tr>
<td></td>
<td>Android Development Tools plug-in</td>
</tr>
</tbody>
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Methodology

Accelerometer

Function:
- To calculate the value of acceleration of 3 directions
- To obtain the value of acceleration

GPS

Space-based global navigation satellite system (GNSS) that provides location and time information in all weather, anywhere on or near the Earth, where there is an unobstructed line of sight to four or more GPS satellites.

Motion detection

(Frames count - Frames background) > Threshold

Finalized Product

Home Security System

Features:
1. Detect three types of accelerations:
   - Falling
   - Intrusion
   - Bother

2. Send out SMS alarm:
   - Alert
   - Defend
   - Intrusion

Algorithm of motion detection

Algorithm of falling detection