Remote Patient Monitoring Using Mobile Phones

Project Code: MWH2b-10

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Introduction

The population of older citizens in Hong Kong has increased continuously in the past 50 years. The percentage increased to 12.5% in 2006, more than 800,000 people reached the age of 65 or above. The number of elderly is expected to remain on an ageing trend. The problem of older people living alone is worsening. Their daily life may face different problems or accidents when they are staying at home.

To provide a better service and reduce the financial budget of the government, and also helping the patients who are in danger, a remote and continuous monitoring system is one of the methods. By measuring the patient’s physiology conditions, the heartbeat rate and analyze the situation automatically, an alert can be sent immediately for asking help to prevent any unfortunate events.

Objectives

- A software running on a mobile phone that can collect useful health indicators
- Some applications due to the analysis of the health indicators
- A database for patient records
- A user-friendly interface

Product specifications

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Type</td>
<td>Platform</td>
</tr>
<tr>
<td>Nominal Equipment</td>
<td>Java SE 6 Update 24</td>
</tr>
<tr>
<td>Operation</td>
<td>Android 2.2 API</td>
</tr>
<tr>
<td>Integrated</td>
<td>Eclipse Classic 3.6</td>
</tr>
<tr>
<td>Environment</td>
<td>SQL lite</td>
</tr>
<tr>
<td>Software</td>
<td>Android SDK</td>
</tr>
</tbody>
</table>

System implementation

Main Components:
1. User interface
2. Bluetooth Connection
3. Alert system
4. Database system

User interface

Features:
1. 100% touch control
2. Large graphical items
3. Large but few words

Database System

Features:
1. Multi-users
2. Privacy Protection
3. Automatic backup

Bluetooth Connection

Features:
1. B2COMM channels
2. Three threads controlling the connection
   - Accepting Thread
   - Connect Thread
   - Connected Thread
3. Synchronized threads

Result

Experiment for determining the accuracy of detecting falling:
1. Allow the phone feel falling at the height of around 1m
2. Repeat 50 times
3. Count the successful times of receiving an alert

Success = 43 times  Failure = 7 times
Accuracy = 86%