A Finger-Pulse-based Mobile Health Monitor
Introduction

- Health issue is a highly interested topic and there is a great market potential.

- Embedding health monitor into a mobile is highly portable and multi-functional.

Objectives

- Providing a preliminary diagnostic health monitor

- Provide cuff-less blood pressure, oxygen saturation and heart rate measurement.

System Specifications

- Support sensor to mobile Bluetooth connection

- Provide oxygen saturation, blood pressure and heart rate cover and numerical value

- Continuous monitoring with giving alert if necessary

- Offer heart beat recovery rate and calories burnt measurement

- Saving user records
Blood Pressure Estimation

- The diastolic time needs to be determined.
- The peak and the foot of the PPG waveform are found first.
- Wavelet transformation is applied for easier determination of the peak and the foot.

After transformation, the blood pressure value is estimated by the following formula:

\[
\text{Mean blood pressure} = \frac{140000}{\text{avg} + 1100}
\]

Heart Beat Recovery Rate

- 6-minute exercise is carried out
- An information note after 6 minutes.
- The instant heart beat rate is read and stored by using \text{start} \_ hr.
- After 30 seconds, the instant heart beat value is read and stored using \text{end} \_ hr.
- The heart beat recovery rate is calculated by the following:

\[
\text{heart beat recovery rate} = \frac{1}{5} (\text{start} \_ hr - \text{end} \_ hr)
\]
**Calories Measurement**

- Monitor the amount of calories that have been burnt out
- Provide four modes (walking, running, hiking and aerobic mode) of calories measurement to user

**Trend display**

- Display the graph of trend of health parameters (Blood pressure, oxygen saturation, heart beat rate) over one week
- Show the average, maximum and minimum values of health parameters over one week to user

**RESULTS**

Several achievements have been developed in our system:

- The waveform of PPG signal can be shown on the Smartphone program.
- Provide cuff-less blood pressure, oxygen saturation and heart rate measurement to user.

The user-friendly graphic user interface has been implemented in the smartphone.