

Smarter mobile phone for personal healthcare

A handheld, affordable, and easy-to-use system has been designed that includes four dry electrodes from which the ECG and the pulse arrival time (PAT, a parameter strongly correlated to blood pressure and arterial elasticity) can be measured. The system can be built as the case of a mobile phone, so that physiological signals can be wirelessly communicated. Partners are sought for further development of the system and patent licensing.

The Challenge

Personal health systems rely on implantable, wearable or portable devices able to acquire physiological signals. These solutions suit applications that need continuous monitoring but are not cost-effective for periodic monitoring, less for eventualities. Hence, there is a need for easy-to-use devices that do not interfere with daily routines neither result in any discomfort yet can provide valuable information about personal health condition when required. Special wrist watches-monitors can offer that information and are not excessively cumbersome, but their capability of communication with decision takers is quite limited.

The Technology

The hands are a very convenient interface and have long been used to obtain the heart rate and the ECG by establishing a contact between each hand and a conductive electrode. Further, small volume changes that result from the arrival of the blood pulse to the hands can be detected from the changes in electrical impedance measured between fingers. We have designed a measurement system able to obtain both signals by using only four metal contacts, two with two different fingers of each hand. The time interval between the highest peaks of both signals is the pulse arrival time (PAT), and depends on blood pressure and arterial elasticity. This sensor unit can be easily merged with a mobile phone.

Innovative advantages

- Only four dry electrodes for fingers to contact required. No gel or cream, no contacts with the thorax or any other body part.
- No auxiliary personnel required to apply it.
- Beat-to-beat measurements, not just average heart rate.
- Provides information about both the heart and the major blood vessels.
- Can be adapted to any wireless technology.

Current stage of development

Laboratory prototype available.

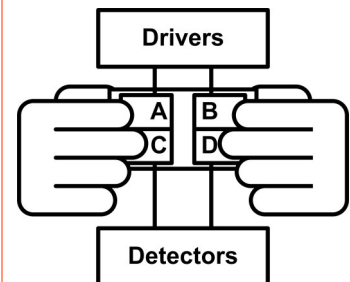
Applications and Target Market

Personal mobile healthcare, emergency medical technicians, first responders, rescue workers, drug testing, drug dose adjustment, remote physiological monitoring.

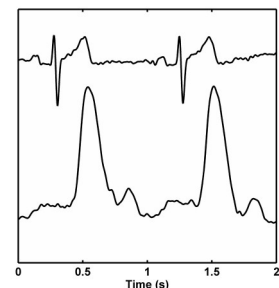
Reference number

MKT2011/0088_H

Cardiovascular sensing based on finger contacts suitable for mobile phone users



The ECG and the pulse arrival time can be obtained from finger electrodes



Pulse arrival time measured using four finger electrodes

Business Opportunity

Technology available for licensing with technical cooperation

Patent Status

EP, JP, CN, IN, US application

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