**Article: Health Monitoring System**

### 1. Smart health monitoring systems: an overview of design and modelling

### *- MM Baig, H Gholamhosseini*

### Abstract:

### This paper presents a review of smart health monitoring systems and an overview of their design and modelling. Furthermore, a critical analysis of the efficiency, clinical acceptability, strategies and recommendations on improving current health monitoring systems will be presented. The main aim is to review current state of the art monitoring systems and to perform extensive and an in-depth analysis of the findings in the area of smart health monitoring systems. In order to achieve this, over fifty different monitoring systems have been selected, categorized, classified and compared. Finally, major advances in the system design level have been discussed, current issues facing health care providers, as well as the potential challenges to health monitoring field will be identified and compared to other similar systems.

### Link: <https://www.academia.edu/download/45155819/s10916-012-9898-z.pdf>

2. Fully automated health monitoring system in the home

*- Mitsuhiro Ogawa*

Abstract:

The aim of this study was to provide adequate home health monitoring in the home by using fully automated bio signal measurement to support daily health care and to improve quality of life. We attempted to develop a home health monitoring system that did not provide any restrictions during sleep. bathing or elimination. A set of room containing a bedroom. bathroom. and toilet room was constructed. The system consisted of monitoring devices and a computer terminal for collecting data. The data were automatically collected from the monitoring devices placed at the bed, bath, and toilet and were transferred to a data terminal in the bedroom and stored for further analysis. The data acquisition system is now being used for seven days and data are collected without any trouble.

Link: <https://www.jstage.jst.go.jp/article/ieejeiss1987/118/7-8/118_7-8_993/_pdf>

3. Intelligent mobile health monitoring system

*- R Shahriyar, MF Bari, G Kundu, SI Ahamed*

Abstract: In this paper we present Intelligent Mobile Health Monitoring System (IMHMS), which can provide medical feedback to the patients through mobile devices based on the biomedical and environmental data collected by deployed sensors.

Link: <https://eudl.eu/pdf/10.1007/978-3-642-11745-9_2>

4. The design of a m-Health monitoring system based on a cloud computing platform

- *B Xu, L Xu, H Cai, L Jiang, Y Luo*

Abstract:

Compared to traditional medical services provided within hospitals, m-Health monitoring systems (MHMSs) face more challenges in personalised health data processing. To achieve personalised and high-quality health monitoring by means of new technologies, such as mobile network and cloud computing, in this paper, a framework of an m-Health monitoring system based on a cloud computing platform (Cloud-MHMS) is designed to implement pervasive health monitoring. Furthermore, the modules of the framework, which are Cloud Storage and Multiple Tenants Access Control Layer, Healthcare Data Annotation Layer, and Healthcare Data Analysis Layer, are discussed.

Link: <https://www.tandfonline.com/doi/abs/10.1080/17517575.2015.1053416>

5. A survey on health monitoring systems for health smart homes

- *H Mshali, T Lemlouma, M Moloney, D Magoni*

Abstract:

The aim of HMS is to not only reduce costs but to also provide timely e-health services to individuals wishing to maintain their independence. In this way, elderly people can avoid, for as long as possible, any interaction with healthcare institutions, which in turn reduces pressure on the health system. To fully realise this vision of seamless e-health services supporting people in need of them, a number of challenges that need further investigation still exist. To this end, we provide an overview of the current state of the art for smart health monitoring systems. We review HMS in smart environments from a general perspective and with a particular focus on systems for the elderly and dependent people. We look at the challenges for these systems from the perspective of developing the technology itself, system requirements, system design and modelling.

Link: <https://hal.science/hal-01715576/document>

6. Bridge health monitoring system based on vibration measurements

*- E Ntotsios, C Papadimitriou, P Panetsos*

Abstract:

A bridge health monitoring system is presented based on vibration measurements collected from a network of acceleration sensors. Sophisticated structural identification methods, combining information from the sensor network with the theoretical information built into a finite element model for simulating bridge behaviour, are incorporated into the system in order to monitor structural condition, track structural changes and identify the location, type and extent of damage. This work starts with a brief overview of the modal and model identification algorithms and software incorporated into the monitoring system and then presents details on a Bayesian inference framework for the identification of the location and the severity of damage using measured modal characteristics. The methodology for damage detection combines the information contained in a set of measurement modal data with the information provided by a family of competitive, parameterized, finite element model classes simulating plausible damage scenarios in the structure. The effectiveness of the damage detection algorithm is demonstrated and validated using simulated modal data from an instrumented R/C bridge of the Egnatia Odos motorway, as well as using experimental vibration data from a laboratory small-scaled bridge section.

Link: <https://eprints.soton.ac.uk/372218/1/BEE2.pdf>

7. A wireless health monitoring system using mobile phone accessories

- *MS Mahmud, H Wang*

Abstract:

This paper presents the design and prototype of a wireless health monitoring system using mobile phone accessories. We focus on measuring real time Electrocardiogram(ECG) and Heart rate monitoring using a smartphone case. With the increasing number of cardiac patients worldwide, this design can be used for early detection of heart diseases. Unlike most of the existing methods that use an optical sensor to monitor heart rate, our approach is to measure real time ECG with dry electrodes placed on smartphone case. The collected ECG signal can be stored and analysed in real time through a smartphone application for prognosis and diagnosis. The proposed hardware system consists of a single chip microcontroller (RFduino) embedded with Bluetooth low energy (BLE), hence miniaturizing the size and prolonging battery life. The system called "Smart Case" has been tested in a lab environment. We also designed 3D printed smartphone case to validate the feasibly of then system. The results demonstrated that the proposed system could be comparable to medical grade devices.

Link: <https://ieeexplore.ieee.org/ielaam/6488907/8172502/7803609-aam.pdf?tag=1>

8*.* A health monitoring system using smart phones and wearable sensors

- *V Gay, P Leijdekkers*

Abstract:

This paper describes work in progress regarding personalized heart monitoring using smart phones. Our research combines ubiquitous computing with mobile health technology. We use wireless sensors and smart phones to monitor the wellbeing of high risk cardiac patients. The smart phone analyses in real-time the ECG data and determines whether the person needs external help. Depending on the situation the smart phone can automatically alert pre assigned caregivers or call the ambulance. It is also used to give advice (e.g. exercise more) or to reassure the patient based on the sensors and environmental data.

Link: <https://www.researchgate.net/profile/ValerieGay/publication/228343525_A_health_monitoring_system_using_smart_phones_and_wearable_sensors/links/0fcfd50f74f734ef3a000000/A-health-monitoring-system-using-smart-phones-and-wearable-sensors.pdf>

9. Remote health monitoring system through IoT

- *AM Ghosh, D Halder*

Abstract:

Remote health caring of patients at home is increasing with the popularity of various nature of mobile devices that has developed to enable remotely caring. The cloud as well as IoT (Internet of Things) and the mobile technologies make it easier to monitor the patients’ health conditions by sharing the health information to health care teams such as doctors, nurses and specialists. However, the guardians of the patients can be anxious about their patients when they are in work. By ensuring guidance awareness about the patients, it can bring more liability of the hospital management. We have demonstrated a health care system for hospital management to allow guardians along with doctors to remotely monitor health conditions of patients via internet. Remote monitoring and guidance awareness by sharing information in an authenticated manner are the main focus.

Link: <https://www.alamgirhossain.com/papers/ghosh2016.pdf>

10. Ubiquitous mobile health monitoring system for elderly (UMHMSE)

*- A Bourouis, M Feta, A Bouchachia*

Abstract:

Recent research in ubiquitous computing uses technologies of Body Area Networks (BANs) to monitor the person's kinematics and physiological parameters. In this paper we propose a real time mobile health system for monitoring elderly patients from indoor or outdoor environments. The system uses a bio signal sensor worn by the patient and a Smartphone as a central node. The sensor data is collected and transmitted to the intelligent server through GPRS/UMTS to be analysed. The prototype (UMHMSE) monitors the elderly mobility, location and vital signs such as Sp02 and Heart Rate. Remote users (family and medical personnel) might have a real time access to the collected information through a web application

Link: <https://arxiv.org/pdf/1107.3695>