

# Measurement of Physiological Parameters of Human Body by Using Mobile Devices

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**Abstract:** *As in today's time, the workers working in an industry don't even get time to get note of what their health parameters speaks of and thus used to suffer with many more diseases related with the physiological parameters. The aim of this review paper to summarize the past and recent developments carried out in the field of medical towards regular monitoring of physiological parameters of human body which is to be recorded on desktop or other platforms. Such a device can be easily handled by non-technical personnel also and can be used in industries as well as in clinics. This paper is presented with a motto of saving the time of doctors in the hospitals as well as industrial workers in an industry. This paper specifically deals with the measurement of two vital signs termed as the physiological parameters: Heart Beat and Blood Pressure. The low cost of the device will help to lower the cost of monitoring of industrial workers by helping them to recover from the illness. Future work required advancing the field towards accurate measurement of physiological parameters of human body with reliable systems and prospective characterizing it is being discussed.*

**Keywords:** Blood Pressure, Heart Beat, Physiological Parameter, Vital Signs of Human Body, WSN Technologies

## 1. Introduction

In today's tautness life, people are facing multiple physical, physiological and psychological problems. Due to the advancement in technology and the researches carried out in medical advancement, the proximity of these factors underlying the different circumstances of Human Body has been solved to an extent. This paper mainly revolves around the industrial workers making assurance of their health maintenance and safety during the work being carried by them in the industry or factory. The design of physiological measurement systems has been a growing research interest in the last decade, due to the potential applications in medicines, sports and security. The adoption of mobile health-care technology is promising to enhance the quality of life for the regular problems in industrial labors and the elderly, as well as healthy individuals. Furthermore, it offers the potential to monitor the current status of the labor and will help them to get rid of those problems which used to jolt them a lot and this can be done by using regular monitoring in changes of their physiological parameters and keep a record in their changes in the health during their working hours. Wired and wireless sensing units are the two units on which many advancements has been done and again both of these things are associated with the measurement of physiological parameters of human body in actual to come up with better results. Indeed co-locating computational power and radio frequency communication within sensor unit itself is a distinct feature of wireless sensing. This system will be reliable and non-intrusive type which will first all have a sensed value for the parameters of human body and it is being sent on the mobile devices being used which can be any platform of mobile devices where one can get an interaction with the value regarding the parameters and it is all based on GSM Module. The device is battery powered for the outdoor use. Mainly all those research works which has been carried out are towards extremities of

advancement of monitoring systems and to develop a unique system which will again help in monitoring the human body in terms of their health maintenance. So the measured value against the different parameters is being sent on the mobile has been followed up towards the desktop or system which has been placed in front of Coordinator which can have a check of all those parameters of industrial workers working in his department in that industry.

## 2. Overview of Findings

In this present decade, there have been lot of advancement as a whole in the medical field which have introduced a forth step for the doctors as well as many people living their day to day life indulging into activities. There have been many researches which have been carried out in the field of wearable technologies with active clothing where one can go for the measurement of physiological parameters of human body. This thing has certainly introduced a leap in the medical field claiming the definite prospective for the values against the different parameters chosen. It has been conducted like that followed by some data modulation with transfer have been carried out by using zigbee monitoring systems. Always there used to be an advancement of low cost Medicare system for the measurement of physiological parameters of human body. Some new researches have been carried out which are again more beneficial comparable to wearable technologies along comparing with zigbee monitoring systems which is effective recording and analysis of biosignals using mobile devices which have again imparted greater boon for the mankind in terms of monitoring themselves even though they keep themselves busy doing their course of work. There are some researches which have been conducted in the field of On-body health data aggregation using mobile phones. Some researchers are related with the activity recognition using Cell Phone Accelerometers which will help the elderly peoples in a great

way. There have been many researches in the field of wireless networks which include the famous example of body sensor network.

## **2.1 Reported Findings in Past**

M Shankar et al have distinguished their research work in the field of Microchip based wearable system describing as the design and development of a microchip wireless physiological parameter monitoring device has been developed and reported in this paper. This system is able to use for monitor physiological parameters such as body position, heart rate, and human body temperature. This system is built up of electronic device which is worn on wrist and leg by a patient. Measuring vital signs with the help of several sensors, the patient is wirelessly monitored within hospital or his home. The device detects the heart rate, temperature which is being sent to a receiver unit. This is somewhat related to the work which have been done at the past. Covering more instances regarding researches in past, Stefano Abbate et al came up with discussions regarding monitoring of human movements for fall detection and activities recognition in elderly care using wireless sensor network. There has been an advance research in past which includes the study of activity recognition. Stefan Dernbach et al have come up with study regarding the simple and complex activity recognition through smart phones which includes the recognition of simple activities such as cooking, cleaning etc. through a smart phone. Features extracted from the raw inertial sensor data of the smart phone corresponding to the user's activities which are mean to be conducted on the basis of supervised machine learning algorithms.

## **2.2 Findings in Recent Past and Present**

As the time is passing by, there has been much advancement towards the relative scope which has been featured in terms of the technical features and the robustness of the systems which will give the value for the physiological parameters of human body whether it would be taken on the mobile or elsewhere on the screen device. The technical advancement did play a role altogether in recent past and present. Some of the researches are from the data encapsulating the data aggregations of human body. Patrick Kugler et al came up with study of recording and analysis of biosignals on mobile devices which are again very important for healthcare and sports. It has been prepared on the basis of Body Area Networks. In future, the growing processing power of these devices could be used to directly analyze the data. One level up in terms of research, Lama Nachman et al came up with the research work describing On-body health data aggregations using mobile phones whose domain includes post-operative, condition management, fitness and wellness and many others. The recent activity has been carried out in the field of research which includes the wireless non-contact type approach of calculating the physiological parameters of human body. Yu M. Chi and Gert Cauwenberghs described the study regarding Wireless Non-Contact EEG/ECG Electrodes for Body Sensor Networks. In all cases, the challenges in Non-Contact sensing have led to many clever and often-times, proprietary circuit designs in an effort stabilize the electrode's input. Ashraf Darwish and Aboul Ella Hassanien have come up with the study regarding

Wearable and Implantable Wireless Sensor Networks for Healthcare Monitoring. The study includes Wireless sensor network (WSN) technologies have the potential to change our lifestyle with different applications in fields such as healthcare, entertainment, travel, retail, industry, dependent care and emergency management, in addition to many other areas. The combination of wireless sensors and sensor networks with computing and artificial intelligence research have built a cross-disciplinary concept of ambient intelligence in order to overcome the challenges we face in everyday life. One of the main challenges facing the World in recent years has been the increase in the elderly population in developed countries. Coosemans et al., for example, have described a system for continuous wireless intracavitary pressure monitoring of the bladder, while other authors have assembled neural prosthetic devices. This paper explores wearable and implantable body sensor network systems which provide rich contextual information and alerting mechanisms for abnormal conditions in continuous monitoring of patients at large. In addition, this paper evaluates the state of the art research activities and present issues that must be addressed to improve the quality of life through wearable and implantable body sensor networks. As well, we provide an overview of the recent trends on the future of intelligent applications for monitoring, not only from the wearable sensors perspective but also from the implantable sensor perspective. We also discuss the benefits that will be achieved and the outstanding research questions; in addition we introduce the open research problems that will be addressed with the development of sensor network based healthcare environment.

With technological advancement and the depth in the subject, there could be major creative points which will get in relate with the thorough study of physiological parameters of human body which would be taken into consideration for further advancement in terms of equipped technology behind it. Rifat Shahriyar et al have described their study on Intelligent Mobile Health Monitoring System which can be good future scope for the whole advancement of the technologies behind the pure advancement of measuring and controlling physiological parameters of human body basically for the industrial workers. Pervasive computing is the concept that incorporates computation in our working and living environment in such a way so that the interaction between human and computational devices such as mobile devices or computers becomes extremely natural and the user can get multiple types of data in a totally transparent manner. The potential for pervasive computing is evident in almost every aspect of our lives including the hospital, emergency and critical situations, industry, education, or the hostile battle field. The use of this technology in the field of health and wellness is known as pervasive health care. Mobile computing describes a new class of mobile computing devices which are becoming omnipresent in everyday life. Handhelds, phones and manifold embedded systems make information access easily available for everyone from anywhere at any time. We termed the integration of mobile computing to pervasive health care as mobile health care. The goal of mobile health care is to provide health care services to anyone at any time, overcoming the constraints of place, time and character. Mobile health care takes steps to design, develop and evaluate mobile technologies that help

citizens participate more closely in their own healthcare. In many situations people have medical issues which are known to them but are unwilling or unable to reliably go to a physician. Another recent research which is again a future scope for the advancement in the field of measuring physiological parameters have been done in terms of wearable devices. Narendra Kumar et al described the study regarding wearable sensors for remote health care monitoring system. A WBAN can monitor vital signs, providing real-time feedback to allow many patient diagnostics procedures using continuous monitoring of chronic conditions, or progress of recovery from an illness. Recent technological advances in wireless networking promise a new generation of wireless sensor networks suitable for those on-body/in-body networked systems.

### 3. Conclusions

With the process of ease in advancement deploying much technical advancement in medical field, there has been a prime basis fixed for these two parameters: Heart Beat and Blood Pressure which plays a prominent role in case of industrial worker health maintenance. Though the sensor technology can be implanted with the body as a whole but the recent structures towards research have opened the path covering the measurement of physiological parameters of human body on any systems and can be well recorded with accurate settings as well as in measurements. There have been a depth in the recent advancements which enrolled the proper image of the data entered as input to the data received as the output. The mobile part of the system is proposed to realize as wearable equipment, still there is possibility to integrate it to active clothing. There is also possibility to extend the proposed system, to measure more human physiological and environmental parameters.

### 4. Scope of Study

The advancements in technologies are always being the part of the research which is being added in life of the society. The parts of research have been carried in for the measurement of physiological parameters of human body which is to be recorded on mobile devices has taken leap involving the use of wearable technologies. There could be possibility which can be further part of extension to integrate the active clothing which would be a proposed system in itself to measure human physiological; and environmental parameters. It could be prejudice on the basis development which would be carried out in the field of measuring of physiological parameters of human body through the process of sensor technology helping doctors in the clinics as well as industrial workers working in an industry. WSN technologies sourcing on-body/in-body networked systems. The technical advancement in the field of medical field is being enriched with all these implementations of technologies and would be great attire for getting a help in measuring of physiological parameters of human body recorded on any platform on the basis of environmental parameters.

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