Chapter 13
Innovative Information Services by Smart Multimedia Systems for Senior and Disabled Citizens

Puvvadi Baby Maruthi

https://orcid.org/0000-0003-0338-0726

Dayananda Sagar University, Bangalore, India

ABSTRACT

The advanced digital technology and wireless transformation now enabling the user with the next generation to connect devices for home and presents challenges for senior citizens and disabled persons. Wireless sensor network provides a smart health solution for enabling computerized, continuous, physical signals, and performing data processing operations. There are some important parameters such as heart rate, body temperature, respiration rate, blood pressure, etc., that are captured real-time activity signals and analysed by the appropriate connected sensors. Biosensors are complete and continuously capture physiological parameters at any time and everywhere. The complete source of information is integrated with the smartphone devices and sometimes the most risk factor information is immediately sent to the remote hospitals. The main aim of this chapter is to focus on the overview of various advanced technologies like google glass, Fitbit, Microsoft Band, etc. for monitoring elder people and disabled persons.

INTRODUCTION

With an annual increase in the number of elderly people and a scarcity of competent workers, governments around the world may turn to older people to care for wearable technologies to fill the gap. It is an electronic technology of smart devices embedded in our body. This kind of technology is now used for monitoring the health care. Today a vast number of health issues are increasingly with unprecedented rate throughout the world due to the increasing number of chronic diseases especially in older population. To monitor the health care, the wearable technology may have different forms like socks, wireless bandages, watch, smart glasses or tattoo from the skin and smart textiles. These smart technologies are more helpful for older people to live independently, safely and happily.

Wireless sensor network provides a smart health solution for enabling computerized, continuous, physical signals and performing data processing operations. There are some important parameters such as heart rate, body temperature, respiration rate, blood pressure etc., which are captured in real time activity signals and analyzed by the appropriate connected sensors. There are various kinds of sensors for monitoring the physiological parameters that have been shown in the following table.

Table 1. Different Sensors tracking Physiological Parameters

Physiological parameter	Type of Sensor	Type of Data
Heart rate	Photoplethysmography	Raw
Blood pressure	Pressure Sensor	Raw
Blood Glucose	Point of Care Sensor	Raw
Respiration Rate	Sensitive stretch Sensor	Raw
Oxygen Saturation	Photoplethysmography	Raw
Activity Based	Inertial Measurement Unit	Raw
Body Temperature	ThermoCouple	Raw and Aggregated

Biosensors are complete and continuously capture physiological parameters at any time and everywhere. The complete source of information is integrated with the smartphone devices and sometimes the most risk factor information is immediately sent to the remote hospitals. They consider and treat this information given high priority so that health professionals immediately send responses to them. Finally, the health risk problems are prevented and controlled under critical situations. Biosensors are very much useful especially in health care applications so that the patient's health risk information is monitored easily.

In health applications, biosensors are available in the form of socks, helmet, textiles, ring, watch, gloves etc. They can wear easily and also provide comfort with appropriate battery life also enabling the wearable biosensor to monitor health risk information. The following sections describe various wearable sensors capturing different physical parameters and monitoring the real time environment.

Elder people do not know how to use electronic gadgets effectively with current technology. Moreover, sufficient training is required about the usage of smart technology for senior citizens.

BACKGROUND

Nowadays, research is focusing on smart health care systems implemented with internet of things and cloud technology specifications concentrating several challenges and issues.

Iyer (Iyer, 2015) suggested a framework and protocol for an Internet of Things (IoT) based patient monitoring system and advice that IoT devices and sensors connected to the internet might be used to monitor patient health. E-health care nursing with IoT based system has been created that utilizes a variety of communication channels to transport the data, such as radio-frequency identification, sensors, and Wireless Fidelity (RFID), and Bluetooth.

Related Content

Architectures of the Interworking of 3G Cellular Networks and Wireless LANs
Maode Ma (2009). *Encyclopedia of Multimedia Technology and Networking, Second Edition (pp. 67-74).*
www.irma-international.org/chapter/architectures-interworking-cellular-networks-wireless/17384

Ubiquitous Access to Adaptive Hypermedia
Chris Stary (2009). *Handbook of Research on Mobile Multimedia, Second Edition (pp. 347-363).*
www.irma-international.org/chapter/ubiquitous-access-adaptive-hypermedia/21015

An Adaptive Neuro-Fuzzy Inference System-Based Ubiquitous Learning System to Support Learners With Disabilities
Olutayo Kehinde Boyinbode, Kehinde Casey Amoduand Olumide Obe (2021). *International Journal of Multimedia Data Engineering and Management (pp. 58-73).*
www.irma-international.org/article/an-adaptive-neuro-fuzzy-inference-system-based-ubiquitous-learning-system-to-support-learners-with-disabilities/291558

Digital Media in Uganda: Where Regulation and Freedom of Expression Contradictions Are Sharpest
Brian Semujju (2018). *Digital Multimedia: Concepts, Methodologies, Tools, and Applications (pp. 1059-1069).*
www.irma-international.org/chapter/digital-media-in-uganda/189516

Context-Based Scene Understanding
Esfandiar Zolghadrand Borko Furht (2016). *International Journal of Multimedia Data Engineering and Management (pp. 22-40).*
www.irma-international.org/article/context-based-scene-understanding/149230