

paper

by Jhanvi Pathak

Submission date: 16-Jun-2023 02:21PM (UTC+0530)

Submission ID: 2117202115

File name: RESEARCH_WITHOUT_REFERENCE.pdf (75.75K)

Word count: 1560

Character count: 9025

Wearable Sensors: A Review of Current Technology and Applications

ABSTRACT

This paper provides a comprehensive review of Portable physiological sensor or wearable biosensors, focusing on their types, working principles, and clinical applications. This review is based on an extensive literature review conducted on Portable physiological sensor or wearable biosensors. The two main types of biosensors, enzymatic biosensors and affinity biosensors, are thoroughly explained, along with their respective working mechanisms. Furthermore, the emerging applications of Portable physiological sensor or wearable biosensors are discussed, highlighting their potential to revolutionize the medical device industry. Portable physiological sensor or wearable biosensors have gained significant attention in recent years due to their compact size and diverse capabilities. These biosensors have the potential to transform the medical industry by enabling continuous, non-invasive monitoring of various physiological parameters. This paper emphasizes the clinical applications of Portable physiological sensor or wearable biosensors, showcasing their importance as essential tools in healthcare.

KEYWORD: Portable physiological sensor or wearable biosensors, Ring sensor or Finger-worn biosensor, Intelligent garment, Personal safety biosensing device, Stress detection and analysis with automated capabilities

1. INTRODUCTION

Portable physiological sensor or wearable biosensors have garnered immense attention in recent times and are currently regarded as a significant advancement in the field of wearable health technology. Within the realm of biosensors, Portable physiological sensor or wearable biosensors (WBS) emerge as a prominent category, finding utility in healthcare, sports, military applications, and more. The continuous evolution of these devices is expected to yield numerous benefits, including user-friendly interfaces, cost-effectiveness, and real-time information exchange and communication between healthcare professionals and patients.

2. PORTABLE PHYSIOLOGICAL SENSOR OR WEARABLE BIOSENSORS

WEARABLE +BIOSENSORS

Portable physiological sensor or wearable biosensors (WBS) encompass digital devices designed to be worn on the body, such as Intelligent garments, smartwatches, thin bandages, or even tattoos. These devices enable the continuous and constant monitoring of various biometric data, including blood glucose levels, blood pressure, and heart rate. The collected real-time information is subsequently transmitted wirelessly to healthcare providers or monitoring systems.

Portable physiological sensor or wearable biosensors is generally a combination of wearable and biosensors. Wearables encompass various objects that can be donned on the body, such as smartwatches, clothing, bandages, and rings. On the other hand, biosensors, comprised of a transducer, a biosensor reader device, and a biological element, refer to devices used to detect and measure biological information.

TYPES OF PORTABLE PHYSIOLOGICAL SENSOR OR WEARABLE BIOSENSORS:

1. RING SENSOR OR FINGER-WORN BIOSENSOR OR FINGER-WORN BIOSENSOR OR FINGER-WORN BIOSENSOR

- The basic principle of ring sensors is to use a sensor to measure the electrical activity of the body. The sensor is typically located on the inside of the ring and is made of a conductive material, such as metal or carbon. When the wearer wears the ring, the sensor measures the electrical activity of the body through the skin.
- The electrical activity of the body can be used to measure a variety of physiological data, such as heart rate, blood pressure, and respiratory rate. The data collected by the Ring sensor or Finger-worn biosensor or Finger-worn biosensor or Finger-worn biosensor can be transmitted to a computer or smartphone for analysis.
- Ring sensors are a convenient and non-invasive way to collect data about the wearer's health. They are easy to use and relatively affordable and pocket friendly. Ring sensors have the potential to be used to improve the wearer's health by providing feedback on their activity levels, sleep quality, and other health metrics.

2. INTELLIGENT GARMENT

- An Intelligent garment or we can call it as smart shirt is a type of wearable biosensor that can be used to monitor a person's vital signs, such as heart rate, respiratory rate, and body temperature. Intelligent garments are made with conductive fabric that is embedded with sensors. The sensors collect data from the body and transmit it to a

wireless device, such as a smartphone or tablet. This data can then be used to track a person's health and fitness, or to provide early warning signs of medical problems.

3. UPCOMING APPLICATIONS OF PORTABLE PHYSIOLOGICAL SENSOR OR WEARABLE BIOSENSORS

Portable physiological sensor or wearable biosensors or wearable biosensors are devices that can be worn on the body to measure biological signals, such as heart rate, blood pressure, and blood glucose levels. They are becoming increasingly popular as they offer a convenient and non-invasive way to monitor health.

1. PERSONAL SAFETY BIOSENSING DEVICE:

- Road safety is a major concern worldwide, as it has led to the loss of many lives. To address this issue, different sensing techniques have been developed, such as measuring the characteristics of vehicles, environmental conditions and driver behavior patterns. Wearable computers can play an important role in continuously monitoring safety measures to prevent road accidents. They can also provide information to recovery agencies in the event of an accident. The main causes of road accidents are driver intoxication, long driving hours, lack of sleep, and drowsiness. However, wearable devices are not a complete solution for preventing road accidents. Other measures, such as facial expression recognition and speech recognition to estimate the driver's emotional state, can also be used.
- Here are some of the benefits of using wearable computers to prevent road accidents:
 - Early detection: Wearable computers can detect driver fatigue, distraction, and drowsiness early on, before it leads to an accident.
 - Proactive warnings: Wearable computers can provide proactive warnings to drivers, giving them time to take corrective action.
 - Reduced risk: Wearable computers can reduce the risk of accidents by making drivers more aware of their own condition and by providing them with early warnings.

2. STRESS DETECTION AND ANALYSIS WITH AUTOMATED CAPABILITIES

- Automatic stress recognition - Stress detection and analysis with automated capabilities- Stress detection and analysis with automated capabilities(ASR) is a field of research that aims to develop systems that can automatically detect and

quantify stress levels in individuals. ASR systems can be used in a variety of settings, such as the workplace, the classroom, and the healthcare setting.

- There are a number of different physiological signals that can be used to detect stress, including:
 - Heart rate: Heart rate increases in response to stress.
 - Blood pressure: Blood pressure also increases in response to stress.
 - Respiration rate: Respiration rate increases in response to stress.
 - Electrodermal activity: Electrodermal activity (EDA) is a measure of skin conductance, which increases in response to stress.
 - Electrocardiogram (ECG): ECG is a measure of the electrical activity of the heart, which can be used to detect changes in heart rate and rhythm that are associated with stress.
 - Speech patterns: Stress can also be detected by changes in speech patterns, such as increased rate of speech, increased volume, and changes in pitch.

4. CHALLENGES AND OPPORTUNITIES

Wearable sensors face a number of challenges, including:

- Battery life: Wearable sensors typically have a limited battery life, which can limit their use.
- Data privacy: The data collected by wearable sensors can be sensitive, and there are concerns about how this data will be used and protected.
- Social acceptance: Some people may be reluctant to wear wearable sensors due to concerns about appearance or privacy.

Despite these challenges, wearable sensors offer a number of opportunities, including:

- Improved health monitoring: Wearable sensors can be used to track a variety of health metrics, which can help to identify health problems early on and to monitor the effectiveness of treatment.
- Increased fitness and productivity: Wearable sensors can be used to track physical activity and work habits, which can help users to improve their fitness and productivity.
- Enhanced security: Wearable sensors can be used to track the user's location and to detect unauthorized access to the user's devices. This data can be used to protect the user from theft and fraud.

5. CONCLUSION

Portable physiological sensor or wearable biosensors are a promising new technology with the potential to revolutionize healthcare. They can be used to monitor a wide range of physiological signals, including heart rate, blood pressure, blood glucose levels, and body temperature. This information can be used to track health, diagnose disease, and provide early intervention. This paper discussed the detail view of the application we human used in our daily day to day life. This is the detailed overview of the various applications of Portable physiological sensor or wearable biosensors. Portable physiological sensor or wearable biosensors, including ring sensors, Intelligent garments, stress recognition, and preventing road accidents. The paper also discusses some of the challenges that need to be addressed before Portable physiological sensor or wearable biosensors can be widely used. Despite the challenges, the potential benefits of Portable physiological sensor or wearable biosensors are significant. They could be used to improve the quality of life for millions of people by helping to prevent disease, diagnose health problems early, and provide personalized treatment plans. Portable physiological sensor or wearable biosensors could also lead to a reduction in healthcare costs by making it easier for people to manage their own health. The Intelligent garment also has a great impact as it leads to the leading in quality of life thereby reducing the healthcare costs and lastly realizing the future healthcare systems. As the technology continues to develop, Portable physiological sensor or wearable biosensors are likely to become even more widely used and more effective in monitoring health and preventing disease. So, we can conclude that wearable sensors have a great impact on the future care.

6. REFERENCES

paper

ORIGINALITY REPORT

13%

SIMILARITY INDEX

12%

INTERNET SOURCES

1%

PUBLICATIONS

%

STUDENT PAPERS

PRIMARY SOURCES

1

www.jetir.org

Internet Source

9%

2

G.R.J. Christoffersen. "Habituation: Events in the history of its characterization and linkage to synaptic depression. A new proposed kinetic criterion for its identification", Progress in Neurobiology, 1997

Publication

1%

3

vocal.media

Internet Source

1%

4

www.faqs.org

Internet Source

1%

5

www.frontiersin.org

Internet Source

1%

6

library.iugaza.edu.ps

Internet Source

1%

7

www.digitalhealth.net

Internet Source

1%

Sreenivasulu Pachari, Swadesh K. Pratihari,
Bibhuti B. Nayak. " Magnetocapacitance
Response in Combustion Derived BaTiO –
Ferrite Magnetodielectric Composite ", IEEE
Transactions on Magnetism, 2022

Publication

Exclude quotes On

Exclude matches Off

Exclude bibliography On