UNIVERSITI TEKNOLOGI MARA

SLEEP MONITORING SYSTEM USING PULSE SENSOR

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ABSTRACT

Sleep is a crucial part of life for maintaining optimal brain and body function. However, the rising concern of death while sleeping has called for improving monitoring systems. With the development of the Internet of Things (IoT), sleep monitoring systems can be improved. Hence, with a better sleep monitoring system, the patient's condition and heart rate can easily be monitored by their carer and health personnel. This study proposed an IoT-based sleep monitoring system utilizing a wearable device with a heartbeat sensor. This project's hardware development includes a heartbeat sensor, reset button for emergency calls, buzzer, LED, and Arduino UNO as the main controller. When an abnormal heartbeat is detected, alerts are triggered through a Wi-Fi module to notify healthcare personnel on their mobile phones. The complete prototype of this system aims to simplify timely action by healthcare providers, ensuring the well-being of patients during sleep.

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CHAPTER ONE: INTRODUCTION

Sleep is a fundamental aspect of everyone's life to maintain a functional mind and body. Getting quality sleep each night will help every person's physical health and well-being. However, the increasing number of unexpected health incidents during sleep such as sudden cardiac arrest has called for an advancement in monitoring systems to ensure timely intervention. Therefore, the integration of Internet of Things (IoT) technology provides a way to improve the sleep monitoring system.

This study proposes an improved sleep monitoring system that integrates the use of IoT and wearable devices, incorporating a pulse sensor. The integration of IoT allows continuous monitoring and real-time data collection that improve overall patient care. With the ability to monitor important parameters such as heart rate, this system gives a comprehensive solution to address the problem of sleep-related health issues.

The hardware development of this system consists of key components, including a pulse sensor, emergency reset button, buzzer, LED indicators, and Arduino UNO as the main microcontroller. This system uses a Wi-Fi module to send data to the caregiver's mobile phone. This system works by reading the heart rate value and alerting caregivers if any abnormalities are detected by sending an alert message and activating the buzzer and LED. Thus, an immediate response can be given to potential health concerns.

The Internet of Things (IoT) technology helps in enhancing the data collection process. The applications of IoT in the engineering field help greatly in improving the monitoring aspect in various processes and places. In healthcare, IoT enhances medical research, devices, care, and emergency care by providing direct and continuous access to patients without interrupting them. The integration of IoT provides us with enhanced technology, and increased accuracy in providing critical information for essential care in times of emergency support by giving the emergency providers access to the patients before their arrival. Therefore, reducing the possibilities of losses as well as improving emergency healthcare and quality of life.