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Implementation of Ai Based Stress Monitoring System

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ABSTRACT: *Modern fast-paced life is characterised by a constant state of stress. A increasing body of scientific evidence also shows that the elevated, semi-permanent stress levels that many of us experience are linked to a number of health issues. Stress is viewed as an epidemic by some. The Project Development of AI based Stress Monitoring System uses biological sensors to track human body stress. For the purpose of measuring physiological features, three sensors—a skin conductance sensor, an ECG sensor, and a straightforward skin temperature sensor—are incorporated. The measurements are sent to the Arduino for additional processing. Artificial intelligence systems examine the sensor data to ascertain the level of stress the user is currently experiencing. The user's mobile device receives a feed of the predicted status for display and suggestions of stress-relieving activities. Alarm levels indicate stress levels in emergency situations. Based on real-time sensor data, the system can achieve binary classification accuracy of 97.6%.*

KEYWORDS: *stress monitoring system, PDA, physiological signal, PPG, EDA, SKT*

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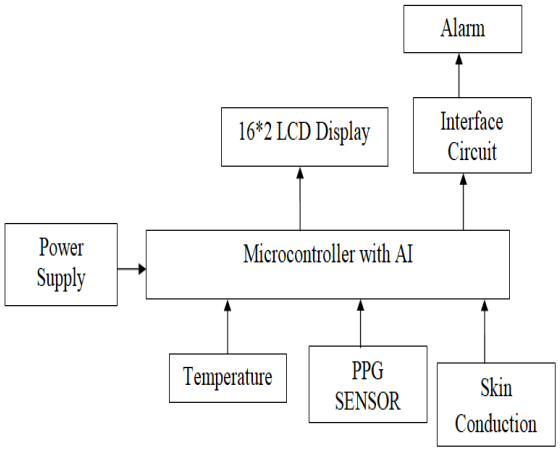
I. INTRODUCTION:

In modern life Given that stress has such a detrimental impact on people's health and performance, it has become a widespread issue. Stress increases the chance of significant cardiac disease, according to research. This served as the inspiration for the creation of a device that measures a person's level of stress and offers solutions via a mobile application. This study used a variety of AI techniques to determine a person's stress level as accurately as feasible. Using a photoplethysmograph (PPG), an EDA sensor, a 3-axis accelerometer, and a temperature sensor, a wearable wireless multi-sensor system was developed. These sensors are built onto a bracelet, which makes it cosy and light. The system features a software programme that uses Bluetooth to communicate the data to a desktop computer. In an effort to improve user comfort, an EDA sensor was incorporated inside a pair of socks. So, the sole of the foot will be used to measure the EDA. The user's degree of stress will be determined by analysing measurements made by these sensors in real-time using cloud-based artificial intelligence technology. Corrective actions will be recommended via a mobile application based on the findings, and in an emergency, the user's doctor may be informed. Our paper accentuation upon the investigation of human changing angles preconditions for employment stress, personal satisfaction[1]. This paper concludes with an overall discussion of PSF lag and linger effects based on the relation between the stress PSF and error occurrence[2]. The purpose of this research is to create a more precise and reliable system for detecting stress in real time utilizing Electroencephalography (EEG) data. The human brain’s electrical activity (EEG) can be used as a reliable, noninvasive stress gauge[3]. This paper investigates the feasibility of detecting different stress levels using electroencephalography (EEG), and evaluates the effectiveness of various stress-relief methods[4]. The key of this work is to create a straightforward pipeline which we hope will motivate research on new vision-based algorithms and methodologies for lightweight human-tracking and flexible human-robot applications[5]. we analyzed the stress distribution and the maximum stress value of the hip joint model using the FEA software. The stress distribution on the hip joint surface was dispersed in the postoperative model compared with the preoperative model in all participants. The maximum stress value was reduced[6]. This study provides detailed insight regarding the effect of objective physiological measures on the validation of subjective self-ratings under a novel complex VR stress training system[7].

II. PROPOSED SYSTEM:

The proposed system for stress monitoring would be a wearable device that tracks physiological signals such as heart rate variability, skin conductance, and body temperature to detect changes in the user's stress levels throughout the day. The device would also incorporate machine learning algorithms to analyze these signals and provide personalized insights and recommendations to help users manage their stress.

- **BLOCK DIAGRAM:**



- **POWER SUPPLY:**

Every electrical and electronic gadget we use on a daily basis needs a power source. In general, we utilise an AC supply of 230V 50Hz, but in order to provide power to various types of devices, this power must be transformed into the necessary form with the necessary values or voltage range.

- **16*2 LCD DISPLAY:**

Using a 16x2 LCD, there are 2 lines that can each display 16 characters. Each character on this LCD is presented using a 5x7 pixel matrix. The 224 different characters and symbols that can be displayed on the 16 x 2 intelligent alphanumeric dot matrix display. The Command and Data registers on this LCD are its two registers.

- **ALARM:**

A sounding device that can transform audio signals into sound signals is a buzzer. DC voltage is frequently used to power it.

- **INTERFACE CIRCUIT:**

A converter guarantees that an analogue voltage is converted to a digital voltage. Low current and voltage are transmitted by sensors. A digital value (0 or 1) is generated from the voltage by the interface circuit. Actuators need more amperage than sensor signals, which have a low current.

- **TEMPERATURE:**

A tool used to measure temperature is called a temperature sensor. This might refer to the temperature of the air, a liquid, or a solid. It follows certain rules for measuring the temperature.

- **PPG SENSOR:**

PPG, or photoplethysmography, is a technique that measures the volumetric fluctuations in blood circulation using an infrared light. This measurement offers important insights about the cardiovascular system.

- **SKIN CONDUCTION:**

A measure of the skin's electrical conductivity is called skin conductance. Two sensors, typically attached to two fingers on one hand, are used to apply a very small electrical voltage to create an electronic circuit in which the body acts as a variable resistor.

- **MICROCONTROLLER WITH AI:**

An embedded system's microcontroller is a small integrated circuit made to control a single function. We may integrate AI into variety of devices using microcontrollers rather than a network connection, which is typically constrained by low bandwidth, significant power consumption, and high latency.

CONCLUSION:

A temperature, GSR, and PPG sensor system with an Arduino controller has been used to construct an IoT stress detection and categorization system. Real-time sensor data is analysed by artificial intelligence systems, which then forecast the present stress level. Three sensors a skin conductance sensor, a GSR sensor, and a straightforward skin temperature sensor are used by the system. The system was put into use with cheap, easily accessible off-the-shelf gear. The information is then sent to a computer for additional examination. The AI system achieves 97.6% accuracy in binary stress state classification.

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