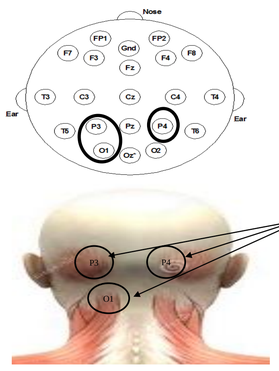
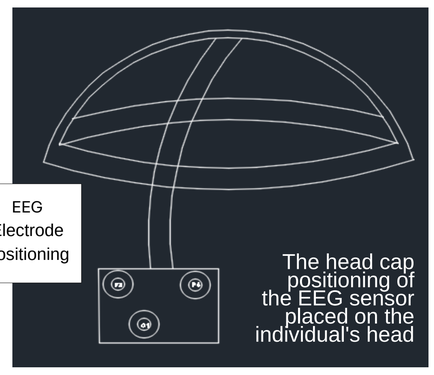
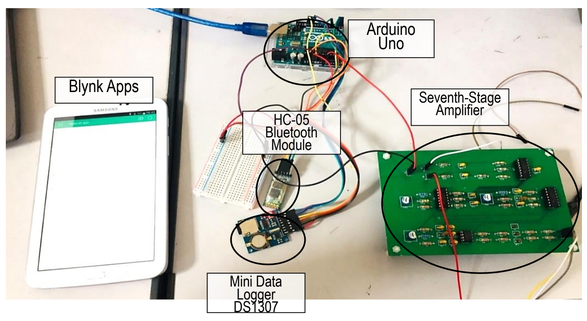
Method of Treating and Monitoring Stress-Related Diseases Using Wireless EEG System

PATENT NO. PI2022007535

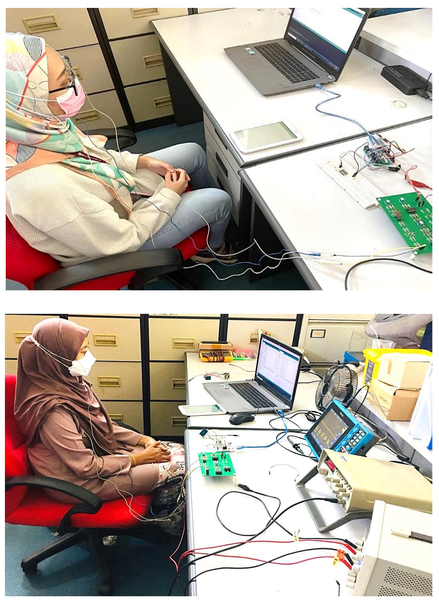
The positioning of the EEG sensor placed on the individual's head



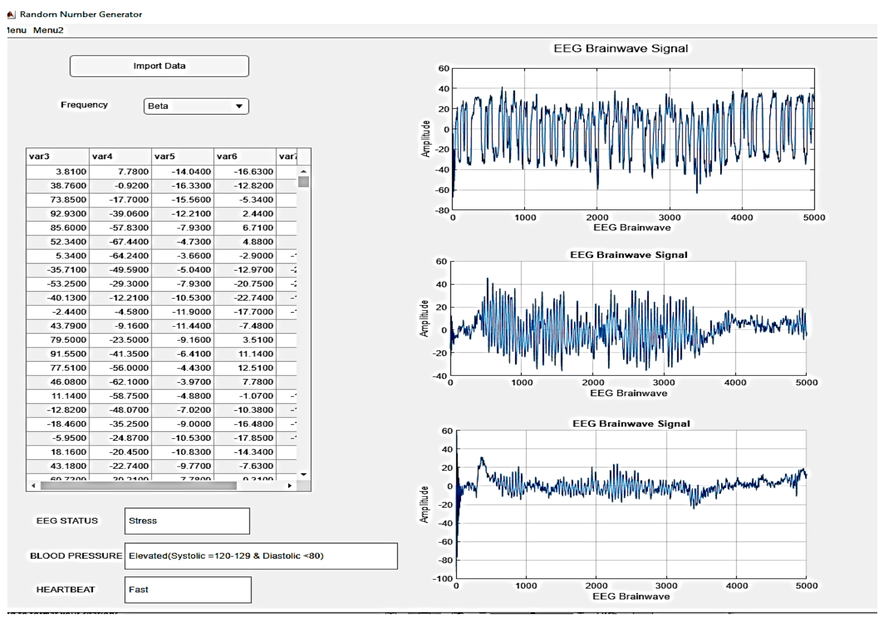




Bluetooth EEG wearable wireless system



Testing the Wireless EEG System with the User



The EEG brainwave signals monitor

BRIEF TECHNOLOGY

The invention relates to a wireless EEG system for treating stress-related diseases, in particular to a method of treating and monitoring stress-related diseases using a wireless electroencephalogram (EEG) system.

CURRENT ISSUES

- **Mental Stress and Health Outcomes:**
  - Growing concern with various adverse health outcomes.
  - Current treatment often involves long-term medication with potential side effects.
  - Debate over the effectiveness of psychiatric medications highlights the need for drug-free alternatives.
- **Role of EEG Systems:**
  - EEG systems play a crucial role in understanding brain activity and emotions.
  - The COVID-19 pandemic has exacerbated stress with social isolation measures.
- **EEG Amplification Process:**
  - Precise amplification is essential for capturing subtle neural signals.
  - Electrode placement, pre-amplification, filters, core amplification, and noise rejection mechanisms are part of the process. Analog EEG signals are digitized and processed using Digital Signal Processing techniques.
- **Innovative Neurofeedback Therapy:**
  - Neurofeedback therapy, combined with Al Quran, offers a novel approach to address mental disorders. Supported by scientific research, it has proven effective for conditions like epilepsy, anxiety disorders, and autism.
- **Wireless EEG Technology Innovations:**
  - Innovations in wireless EEG technology present promising possibilities.
  - Integration of wireless communication modules enhances user-friendliness and affordability. These devices are versatile and cost-effective, making them suitable for a variety of applications.

INVENTIVENESS & NOVELTY

1) The wireless EEG protocols comprising an Xbee, Bluetooth, Wi-Fi and LoRa protocols.
2) The computing unit comprises the Graphical User Interface (GUI) display that has import data button, EEG status indicator to detect and present the mental state of the user and five frequency bands to indicates human brainwave signals comprising Delta, Theta, Alpha, Beta and Gamma.
3) The electrodes produces alpha waves for male & female users while listening to the Al Quran, listening to music, reciting the Al Quran, & reading the book activity.

USEFULNESS

1. Mental Health Monitoring: Helps people monitor & manage mental stress effectively.
2. Cost-Effective Treatment: Offers an affordable and drug-free way to address mental stress.
3. User-Friendly: Suitable for people of all ages and non-invasive.
4. Insightful Data: Provides data-driven insights on how activities like Al-Quran recitation impact mental stress.
5. Integrated System: Combines hardware and software for efficient stress level assessment.
6. Real-Time Feedback: Offers immediate feedback on mental condition, reducing the risk of relapse.
7. Healthcare Applications: Useful for monitoring patients in healthcare settings, especially those prone to stress-related issues.
8. Research Tool: Can be used for broader EEG research related to mental well-being.
9. Remote Monitoring: Suitable for remote areas with limited access to healthcare.

IMPACT OF THE PRODUCT

- Helps people with mental stress, leading to better mental health and an improved quality of life.
- Offers an affordable way to treat mental stress, potentially reducing healthcare expenses.
- Benefits hospitals and mental health clinics, enhancing patient outcomes through real-time feedback and personalized care.
- Supports educational institutions, improving students' mental health and academic performance.
- Contributes to mental health research by providing valuable data for stress management studies.
- Works in remote areas, making mental health care more accessible.
- Helps religious organizations promote mental well-being through practices like Al-Quran recitation.
- Aids government programs in addressing mental health challenges at a larger scale.
- Supports mental health awareness programs by offering practical tools for stress management.
- Advances wearable EEG technology, encouraging the development of affordable health monitoring devices.
- Addresses global mental health concerns, potentially reducing healthcare burdens and improving communities worldwide

MARKET POTENTIAL

Technology Readiness Level (TRL)

7 - Product /System proven

- Healthcare-Hospitals, clinics, mental health centers
- Research
- Remote Areas
- Educational Institutions
- Individuals
- Government
- Religious Organizations

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3 GOOD HEALTH AND WELL-BEING

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