NeuroBreath: An AI-Powered Wearable Device for Stress Reduction Using Personalized Mindfulness Techniques Inspired by Buddhist Philosophy

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Chronic stress can severely impact mental and physical health, contributing to conditions like anxiety, depression, and cardiovascular issues. Inspired by an ancient Buddhist mindfulness breathing technique called Anapanasati, NeuroBreath combines AI-powered wearable technology with gamified mindfulness practices to make stress management more engaging and effective. NeuroBreath integrates a breathing sensor in a wearable belly band to track breathing patterns during mindfulness breathing practice and EEG sensors that measure brainwave activity (such as meditation and attention levels). Through the use of advanced neural networks, a microcontroller processes and transmits real-time data received from the sensors to the mobile app while identifying deviation from a breathing pattern selected at the start of the session. After the session, the app provides a meditation score based on how closely the user followed the breathing pattern and their meditation and attention levels. In addition, it will guide users through the steps they can take to improve. Integration with LLMs in the AI Guru feature provides personalized feedback and answers any meditation or mindfulness-related questions users may have. To better engage users, NeuroBreath incorporates gamification with a five-level meditation journey that encourages consistent practice and progress. The “MindMates” social feature allows people to connect with others and provide support in their mindfulness practices. To further ensure that user needs are met in NeuroBreath, a survey was conducted to better understand participants’ mindfulness practices, challenges, and preferences for app features, including gamification and feedback systems.

Awards Won: