Spark Care+: Personalized Music Therapy Device Utilizing Artificial Intelligence Model

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During the pandemic period, there has been over a 30% increase in people reporting symptoms of anxiety and depression (Pachal, et al, 2021). Mental health issues have an average delay of 11 years between initial symptom onset and treatment, largely due to accessibility (National Alliance on Mental Illness). Since the healing power of music is known to have positive effects on the brain and release the hormones of dopamine, serotonin, and norepinephrine without any known side effects, music can be used to help with relaxation. The purpose of the study is to test the effectiveness of personalized music therapy on relaxation, monitored by Spark Care +, a personalized music therapy device in a wristband model. This model inputs information from Galvanic Skin Response (GSR) and Heart Rate (HR) sensors into a machine learning program created by the researcher. This Python based machine learning program incorporates Ordinary Least Squares Regression and a unique rating system across genres and tempos to select music based on a combination of user preferences and biometrics. 31 participants took part in a ten-minute test session. On average, HR decreased 22.4 ohms (statistically significant using a two-sample T-test, $p < 0.02$), the GSR decreased by 1.5 ohms, and the average of the combination of HR and GSR decreased by 14.1 ohms ($p < 0.02$). More participants showed a decrease in their stress biometrics than an increase or no change (Chi square, $k=3$, $p < 0.05$). The ratings on music selected by the machine learning program increased slightly from the first to last piece on average 4.3 to 4.35 on a 1-5 scale. The data suggests that the personalized music selections driven by the Spark Care + program leads to self-relaxation.

Awards Won:
Third Award of $1,000