



An Affective BCI System

With Music in an Immersive Environment

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Project Objectives:

This study investigates the effectiveness of generated music in an immersive environment in inducing different emotional arousal states in the context of alleviating mood disorders. This project involved end-to-end implementation of a novel data recording system combining Python-based music generation, VR development with Unity, and EEG data streaming and labelling.

The generated music stimuli had varying emotional arousal (high, neutral, and low) and EEG data was collected from 20 participants. The data was evaluated using two state-of-the-art deep network models for EEG emotion classification – TSception and EEGNet.

Results and Conclusion:

High EEG emotion classification accuracies were reported, especially for Low-vs-High arousal classification - 81.57% for TSception and 83.45% for EEGNet. Therefore, it can be concluded that the EEG data collected contained distinctive emotional states.

Classification	Tsception	EEGNet
Low-High	81.57%	83.45%
Low-Neutral	73.02%	75.20%
Neutral-High	68.36%	67.86%
Low-Neutral-High	60.46%	64.63%

This system, combining the effect of VR and music, is effective in inducing emotional arousal states and can be explored further in clinical trials as a potential tool for emotion modulation in alleviating mood disorders.