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Biofeedback-Driven Sound and Image Generation

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Abstract : BIOFEEDBACK exhibition offers a unique experience for each visitor, combining art, neuroscience, and technology in an interactive way. Using a headband that captures the bioelectric activity of the brain, the visitors are able to generate sound and images in a sequence loop, making them an integral part of the artwork. Through this interactive exhibit, visitors gain a deeper appreciation of the beauty and complexity of the brain. As a special takeaway, visitors will receive an NFT as a present, allowing them to continue their engagement with the exhibition beyond the physical space. We used the EEG Biofeedback technique following a closed-loop neuroscience approach, transforming EEG data captured by a Muse S headband in real-time into audiovisual stimulation. PureData is used for sound generation and Generative Adversarial Networks (GANs) for image generation. Thirty participants have experienced the exhibition. For some individuals, it was easier to focus than others. Participants who said they could focus during the exhibit stated that at one point, they felt that they could control the sound, while images were more abstract, and they did not feel that they were able to control them.

Keywords : art, audiovisual, biofeedback, EEG, NFT, neuroscience, technology
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