24 Virtual Reality Therapeutic Application for Stress Reduction

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Abstract

This project introduces an innovative stress reduction application that utilizes virtual reality (VR) technology. By integrating Mediapipe, Scikit-Learn, and OpenCV, the app accurately captures therapists' poses. This enables guided stress reduction exercises in virtual reality, while also assessing the patient's stress levels for informed consultations.

Keywords: Stress Reduction App, Virtual Reality, Interaction App Development, Unreal Engine

1. Introduction

In our fast-paced world, stress has intensified due to events like the Covid-19 pandemic. This project addresses stress management by combining VR technology with automatic posture assessment in an app. It provides immersive stress reduction and precise posture analysis, evaluating correct exercise execution for better preparation before medical treatment.

2. Tools and Methods

The app integrates Mediapipe for real-time gesture tracking, OpenCV for rendering and segmentation, and Scikit-Learn for classification. Meta Quest 2 and Unreal Engine 5.1 create personalized meditation environments, enhancing engagement. The application system and usage are illustrated in Figure 1. Users perform stress reduction actions while the app records activity using an external video recorder. This recorded video will be used later for automatic pose assessment. An in-app stress reduction scene with animated sphere breathing guidance is demonstrated in Figure 2.

3. Conclusion

The proposed VR and pose estimation application offer a new way for stress reduction, providing immersive experiences and real-time assessment. This innovation holds substantial promise for enhancing mental well-being in today's stress-laden world.

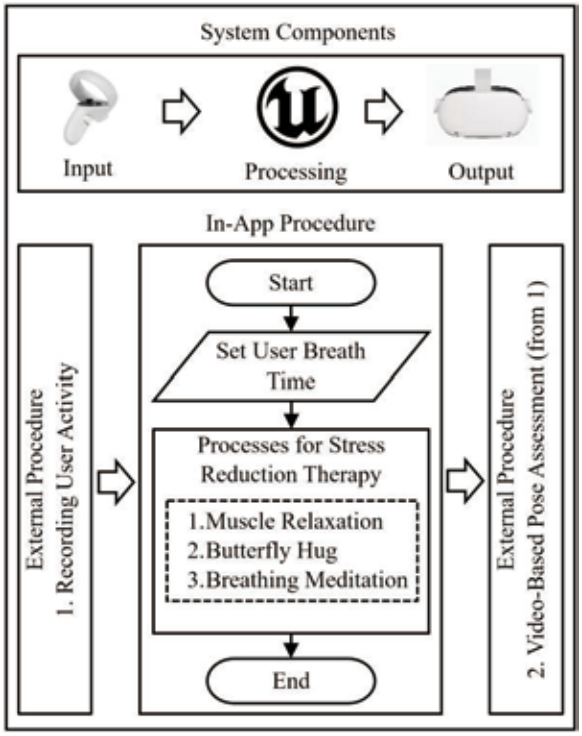

Figure 1: System Components and Application Usage Procedure

Figure 2: In-App VR Breathing Guidance for Stress Reduction - Example Scene