

# Project Report

## RelaxVR

Version 1.0

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April 21, 2025

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# 1 Introduction

RelaxVR , is a VR application that teleports the user into a calming environment while playing relaxing and breathing exercise videos through YouTube, the user can see a room and a video playing and the room is open on all sides allowing the user to view calming environments. The user also has access to change the environment to choose the one they feel most relaxed in. The user can move around in the room or stay stationary.

## 2 Background

In today's fast-paced world, stress and mental fatigue have become increasingly common. While traditional methods such as meditation, breathing exercises, and therapy are effective, technological innovations like Virtual Reality offer new opportunities to enhance relaxation practices. It has the unique ability to create fully immersive environments that can transport users away from stressful surroundings and into calming, controlled spaces.

RelaxVR builds on this potential by offering users a serene virtual environment where they can engage in guided relaxation and breathing exercises. By combining immersive visuals with curated calming videos sourced from YouTube, RelaxVR aims to create a multi-sensory relaxation experience. The application places users inside a virtual open-room environment where they can freely explore or remain stationary, surrounded by tranquil scenes such as beaches, forests, or mountains.

Additionally, RelaxVR allows users to personalize their experience by allowing them to change the surrounding environment based on what makes them feel most at ease. This flexibility ensures that the app caters to a wide range of preferences, enhancing its effectiveness as a tool for stress reduction and mental wellness.

## 3 Methods

### 3.1 Tools used to create the project

The development of **RelaxVR** involved a combination of programming, environment design, and device testing tools to create an immersive virtual reality experience:

- **Android Studio:** Used as the main Integrated Development Environment (IDE) for writing, building, and managing the Kotlin-based application.
- **Kotlin:** Chosen for its modern features and seamless integration with Android development, Kotlin served as the primary programming language for RelaxVR.
- **Meta Spatial SDK (v0.5.5):** Provided the core VR functionality, allowing for spatial awareness, user interaction, and rendering of 3D environments.
- **Meta Spatial Editor:** Used to visually design and organize the 3D room and environmental elements. The editor, similar to Unity, streamlined the process of placing, adjusting, and customizing assets within the virtual scene.
- **Skybox Generator ([skybox.blockadelabs.com](https://skybox.blockadelabs.com)):** AI-generated skybox images were created using this online tool to provide realistic, calming backgrounds that enhance the user's sense of immersion.
- **Meta Quest Developer Hub:** Used for device management and testing, including casting the VR display to a computer for easier debugging and real-time observation during development.

By combining these tools, RelaxVR was able to deliver a high-quality, customizable, and immersive relaxation experience on the Meta Quest platform.

### 3.2 How the project works

**RelaxVR** provides a simple and immersive user experience by combining VR environments with relaxing video content. When the application starts, the user is placed inside an open virtual room designed to feel spacious and calming. A YouTube video automatically plays within the environment, guiding users through relaxation exercises or breathing techniques.

Users can interact with the environment in the following ways:

- Move around the virtual room, exploring the surroundings from different angles.
- View calming open environments through the sides of the room, such as beaches, forests, or mountains.
- Switch to different environments by selecting from available options, allowing them to choose the setting they find most relaxing.

The visual surroundings are enhanced by AI-generated skyboxes, creating an immersive 360-degree experience without the need for heavy 3D models.

The app uses Meta Spatial SDK features to manage spatial positioning and user movement, while the video player remains anchored in the scene for continuous playback.

The overall goal is to minimize user interaction complexity, allowing users to quickly enter a relaxed state without needing to navigate complicated menus or controls.

## 4 Limitation

While **RelaxVR** successfully creates an immersive and calming experience, there are certain limitations to the current version of the application:

- **Limited Environment Options:** The number of available environments is currently limited.
- **Basic User Interaction:** Interaction is limited to movement within the room and environment switching.
- **Video Source Dependence:** RelaxVR relies on YouTube for video playback, which requires a stable internet connection. Any issues with video streaming may affect the user experience.
- **Device Compatibility:** The app is currently optimized for Meta Quest devices using Meta Spatial SDK and may not function as intended on other VR platforms without significant modifications.

## 5 Future Work

There are several areas where **RelaxVR** can be expanded and improved in future versions:

- **Offline Mode:** Implement support for offline video playback by allowing users to download videos in advance, reducing reliance on a constant internet connection.
- **Advanced User Interaction:** Add features such as environment customization (e.g., choosing time of day, background sounds, or weather effects) to make the experience more personal and engaging.
- **Cross-Platform Compatibility:** Extend support beyond Meta Quest to additional VR platforms to reach a broader audience.
- **Passthrough Mode:** Introduce a passthrough option where users can blend their real-world surroundings with virtual relaxation elements.
- **Background Music Mode:** Allow users to choose a mode that plays only calming background music without video, for a more minimal and less visually engaging relaxation experience.
- **User-Generated Skyboxes:** Enable users to generate skyboxes based on their preferences, making the environment even more personalized and meaningful.
- **Personalized Relaxation Flow:** Introduce an optional questionnaire at the start of a session to assess the user's current stress level, then recommend suitable videos, background music, and skybox environments based on their emotional state.