IO5. Creation of a Virtual Reality (VR) Software Programme

Technical Manual

İsmail Uzun
Alihan Salman
Ökkeş Çetinkaya
Becure GmbH

Date: 24/11/2023

Change Control
Document Properties

Deliverable No.	5	
Work Package No.	WP5	**Work Package Title**	IO5. Creation of a Virtual Reality (VR) Software Programme for Teaching Stress Management to Refugee Offenders, Developing Methodology of Using VR Technology in the Rehabilitation of Refugee Offenders
Author/s	SALMAN; Alihan | Becure GmbH	
Contributor/s	ÇETİNKAYA; Ökkeş | Becure GmbH UZUN; İsmail | Becure GmbH	
Reviewer	All partners	

Table of Contents

Introduction

This document has been prepared by Becure GmbH, one of the partners of the TRAIVR project, and is a comprehensive guide providing information about the structure, functionality, and user interface components. Whether you are a developer, tester, or end user, this documentation will help you navigate through the project with ease. For more information, please visit https://www.traivr-project.org/.

This project is funded by the Erasmus+ Program of the European Union. However, European Commission and Turkish National Agency cannot be held responsible for any use which may be made of the information contained therein.

Purpose

The primary objective of this documentation is to provide clear and detailed information about the TRAIVR Project. It aims to facilitate a better understanding of the project's scenes, buttons, and their respective functionalities. Additionally, it serves as a reference guide for all individuals involved in the development, testing, or use of the project.

Target Audience

This documentation is intended for:

- Developers who need to work on or maintain the project's codebase.
- Testers responsible for verifying the project's functionality and user interface.
- End users who want to learn how to navigate and interact with the project.

Documents Scope

In this document, an overview of the project's structure, descriptions of each scene, detailed explanations of UI components, and their respective functions are presented. It also covers the navigation flow between scenes and provide insights into the underlying code structure where necessary.

Project Overview

The primary objective of the TRAIVR project is to address the language barrier challenges and provide rehabilitation support to refugee offenders who are under probation. This will be achieved through the development of a virtual reality program aimed at enhancing the coping abilities, specifically in problem-solving and emotion regulation skills, of these probation officers.

Project Goals

Alleviate language barrier challenges within the probation system, enabling probation officers to better serve refugee offenders.

Enhance the support capabilities of probation officers who work with refugee offenders with the use of VR technology.

Develop a virtual reality program that focuses on improving problem-solving and emotion regulation skills for probationers, thereby enhancing their effectiveness in assisting and communicating with their refugee offender clients.

Target Audience

The TRAIVR project is intended to benefit probationers who are refugees with drug use problems. It aims to provide these refugee probationers with VR technology to improve their ability to manage stress, solve problem and regulate emotions.

Technologies

Hardware

Some specific hardwares are needed to be used for this project. The list of hardwares as following

Virtual Reality Headset

For the project, the HTC Vive is chosen because of its common use and consistent control API. It is suited for faster and easy development of the projects. HTC Vive is connected to the PC so like other headsets it does not need to have constant charging after sessions.

HTC Vive has 2 VR controllers and 2-3 tracking stations. The tracking stations are cameras around the playground tracking the headset and controllers' movement.

Computer

The HTC Vive is connected to a computer and using its processing and graphical power to run the games. Recommended system requirements for HTC vive are presented below.

Component	Recommended System Requirements by Vive	Minimum System Requirements	Recommended For the Project
Processor	Intel Core i5-4590 or better	Intel Core i5-4590 or better	Intel Core i5 or i7 10th generation or better
GPU	NVIDIA GeForce GTX 1060 or better	NVIDIA GeForce GTX 970 or better	NVIDIA GeForce GTX 1650 or better
Memory	4 GB RAM or more	4 GB RAM or more	8 GB RAM or more
Video output	HDMI 1.4, DisplayPort 1.2 or newer	HDMI 1.4, DisplayPort 1.2 or newer	HDMI 1.4, DisplayPort 1.2 or newer

Controller Interaction Basics

In TRAIVR, the controllers play a vital role in facilitating interactions within the virtual rehabilitation environment. Users will rely on the controllers to navigate, manipulate objects, and interact with the application's features. Here are the fundamental principles of controller interaction:

Trigger Buttons: The trigger buttons, primarily located on both controllers, serve as the primary means of interacting with objects and elements in the VR environment. Users can press the trigger buttons to grasp, pick up, or manipulate objects. This intuitive interaction method enhances the immersion and engagement of users during rehabilitation scenarios.

Teleportation: The left-hand analog stick or similar input method allows users to teleport within the VR environment. By selecting their desired destination with the left controller, users can instantly move to different locations, promoting seamless navigation and exploration.

Rotation Control: The right-hand analog stick or equivalent input device enables users to rotate their view without physically turning their heads. This functionality is particularly

useful for surveying the surroundings and getting a better perspective on the rehabilitation scenario.

Button Interactions: For option interactions, users can point the right controller at the desired option or feature. This precise pointing method make it easy for users to various elements within the application.

By mastering these controller interactions, users can effectively engage with TRAIVR's rehabilitation scenarios, making the VR experience intuitive, immersive, and user-friendly.

Scene Overview

In the TRAIVR Unity Project, various scenes are meticulously designed to provide users with a seamless and engaging experience. Each scene plays a specific role in the rehabilitation process for refugee and immigrant offenders.

Main Menu

The "Main Menu" scene is the entry point to the TRAIVR VR application. It offers a user-friendly interface designed to navigate through different program options and access the rehabilitation content.

The "Main Menu" scene is characterized by the following key elements:

- **Start Button:** Clicking on the "Start" button initiates the rehabilitation journey, redirecting users to the "ID screen" and "Level Select" screen, where they can choose from various rehabilitation scenarios.

- **Reports Button:** The "Reports" button provides access to the reports menu, which houses vital information and feedback on the user's progress. It also includes two additional buttons for further navigation.

- **Settings Button:** Clicking on "Options" opens the options panel, allowing users to configure various settings to enhance their experience.

- **Exit Button:** The "Exit" button offers a straightforward exit from the TRAIVR application.

The "Main Menu" scene is a central hub designed for intuitive navigation and an inclusive experience. It empowers users to explore and engage with TRAIVR's rehabilitation resources effectively.

ID Screen

The "ID Screen" is a pivotal component of TRAIVR, appearing as a crucial checkpoint just before users can access features like the "Level Select" and their personal reports within the "Reports Panel." Its primary function is to collect and verify a unique identification code from the user before granting access to specific areas of the VR application.

The main purposes of the "ID Screen" are as follows:

- **User Authentication:** By requiring a unique ID, the application ensures that users are who they claim to be, providing a level of personalization.

- **Progress Tracking:** The collected ID helps the application link users to their individual rehabilitation data and progress, making it possible to provide personalized reports and tailor the rehabilitation modules.

Users are prompted to enter their unique ID through the interface.

Level/Scenario Select
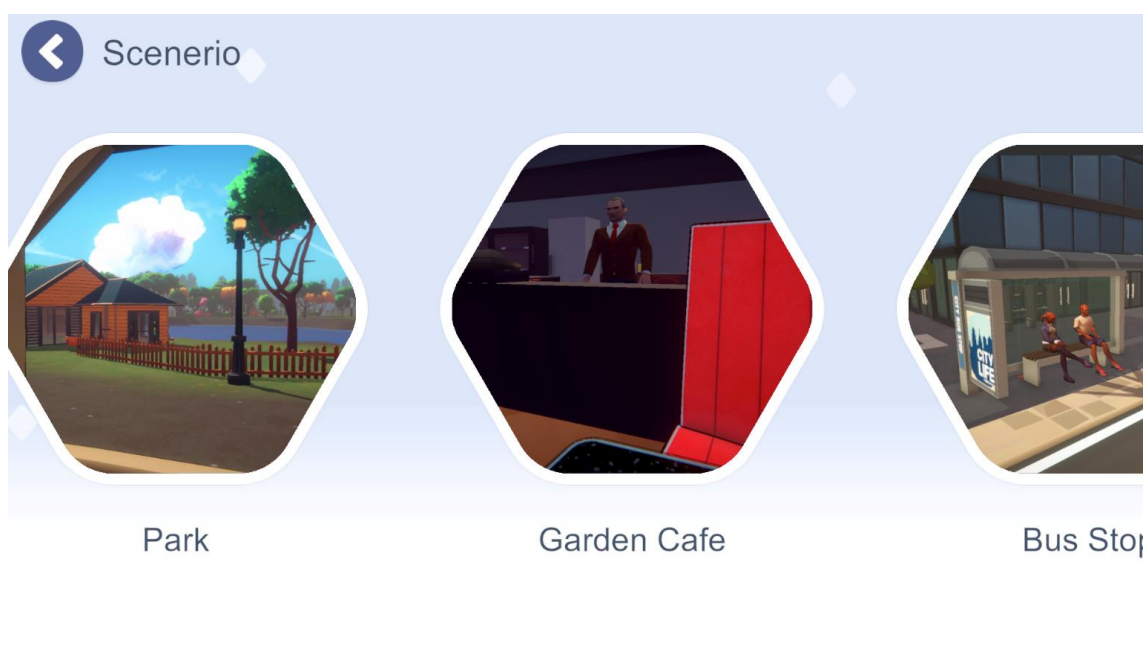
The "Level Select" scene is where users embark on their rehabilitation journey. It allows them to choose from various rehabilitation scenario, each tailored to address specific challenges.
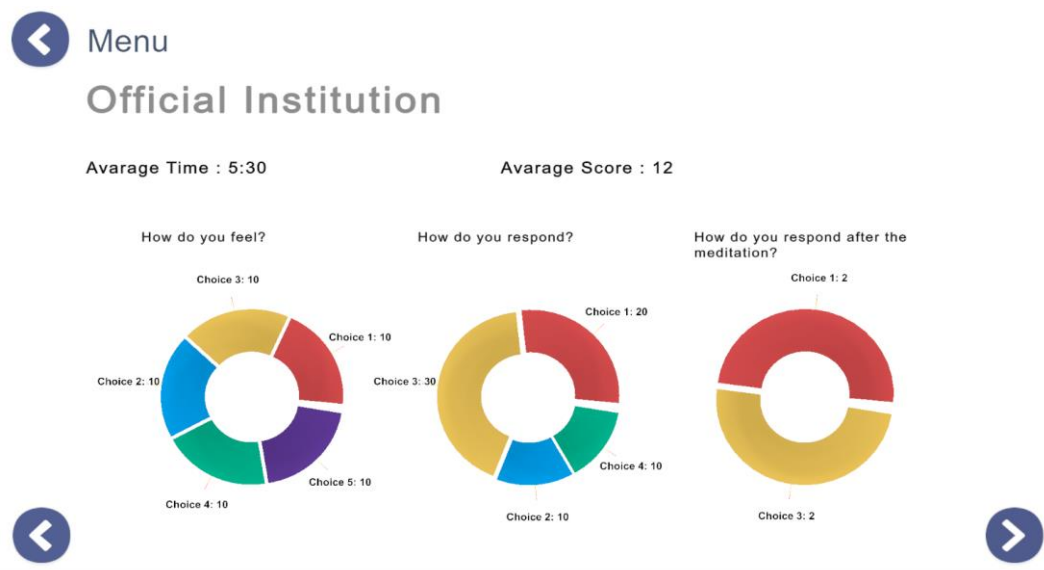
Users can slide between 4 scenarios and click on them or press back button on top left to go previous menu.

Erasmus+

Reports Menu

The "Reports Menu" is a crucial component of TRAIVR, providing valuable insights and feedback to users as they progress through the rehabilitation program. Here's what you'll find in the "Reports Menu" scene:

Reports Menu - General Reports

"General Reports" offer comprehensive insights into user performance and participation across various scenarios and modules within TRAIVR.

General details for each scene such as average time, score, and choice statistics are seen. User can navigate between scenarios from left and right arrow buttons below the screen.

Reports Menu - Choice Statistics

In addition to "General Reports," the "Reports Menu" offers the "User Statistics" feature, providing users with a more personalized data. In this scene users can see unprocessed data for the player.

Settings Menu
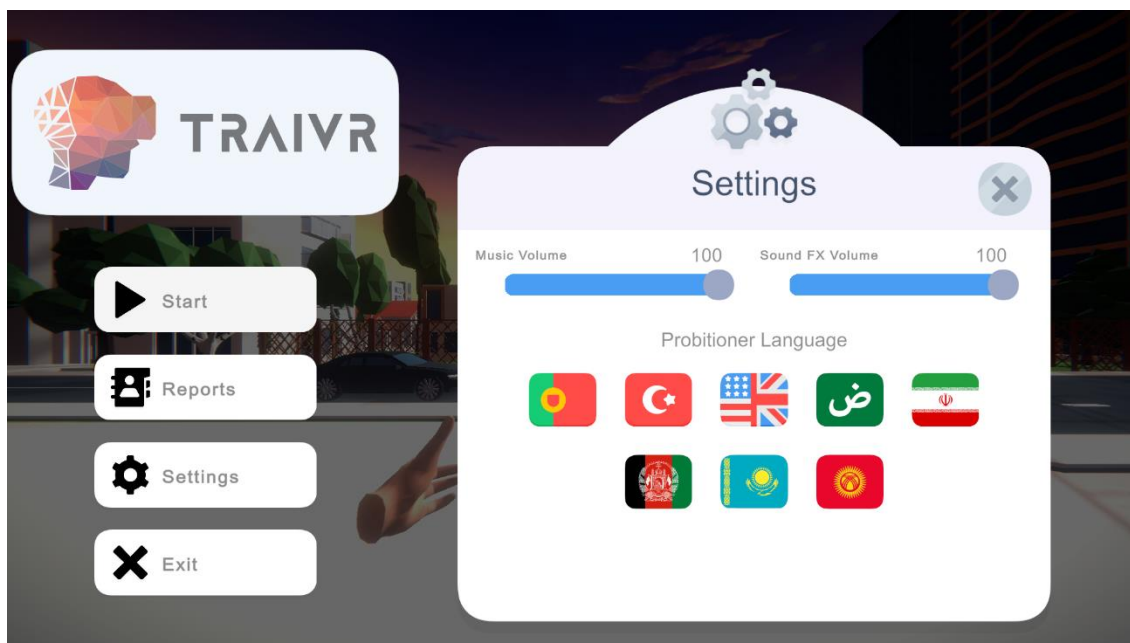
The "Options Panel" is designed to enhance the user experience by allowing customization of various settings. Here's what the "Options Panel" scene offers:

- **Music Volume:** Users can adjust the volume of background music to a level that suits their preferences. Whether they prefer a soothing background melody or a more immersive soundscape, this setting allows them to fine-tune their auditory experience.

- **Sound FX Volume:** The "Sound FX Volume" setting allows users to control the volume of in-game sound effects. This customization empowers users to enhance their virtual reality environment, making it more engaging and interactive.

- **Probationer Language:** The "Probationer Language" setting influences the language used in the general PC user interface, including menus and reports. Users can choose their preferred language, ensuring that they can easily navigate and understand the application's non-VR elements.

- **User Language:** This setting impacts the language used during VR interactions, including questions and feedback. Users can select their desired language to facilitate effective communication and engagement during the rehabilitation process.

Game Menu

The "In-Game Menu" consists of the following key components:

1. **Pause Button (Top Left):** The pause button is conveniently located at the top left corner of the screen. Users can tap or select it to pause the ongoing scenario or rehabilitation module. Pausing allows users to take a break, review instructions, or do adjustments as needed.

2. **Score and Time (Top Right):** The top right corner of the screen displays information. Users can monitor progress through the "Score" and "Time" indicators. "Score" reflects the points earned during the scenario, while "Time" keeps track of the time elapsed in the rehabilitation session.

Erasmus+

Game Menu - Pause Panel
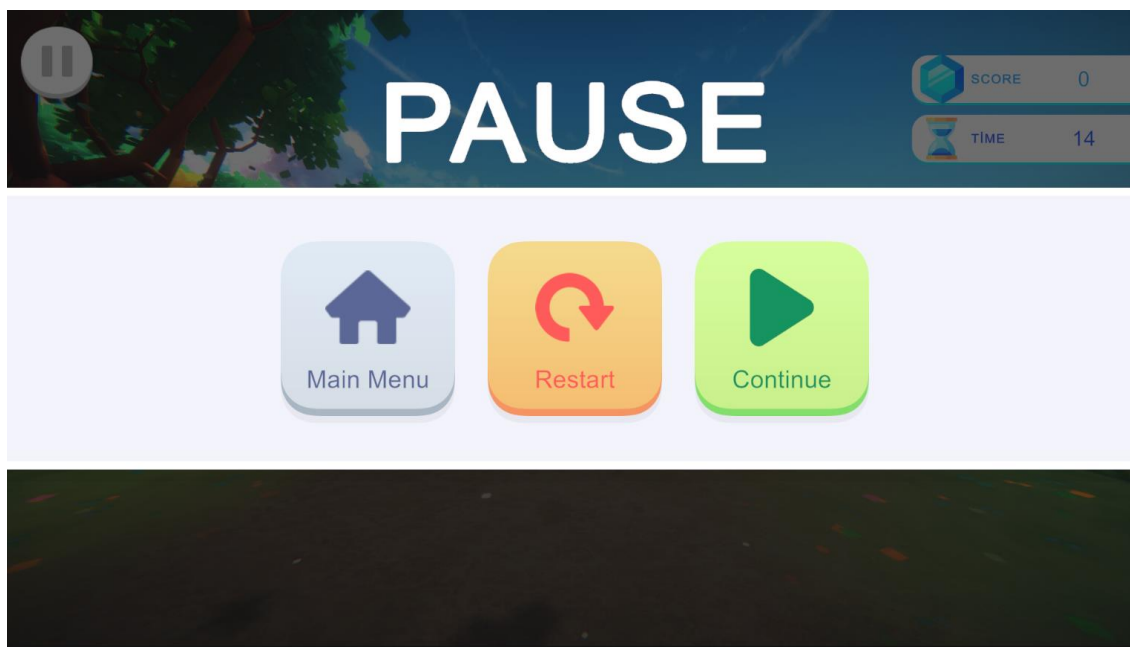
The "Pause Panel" comprises three important buttons, each serving a specific purpose:

1. **Main Menu:** The "Main Menu" button redirects users to the central hub of the TRAIVR application, allowing them to access various features, including scenario selection and reports. This option is ideal for users who wish to exit the current scenario and explore other aspects of the application.

2. **Restart:** The "Restart" button enables users to restart the current scenario from the beginning. This feature is helpful for users who want a fresh start in the rehabilitation module or need to retry the scenario to improve their performance.

3. **Continue:** The "Continue" button resumes the paused scenario from the point where it was stopped, allowing users to pick up where they left off. This feature ensures a seamless and uninterrupted rehabilitation experience.

Closing Remarks

Conclusion

In this document, a comprehensive overview of the TRAIVR VR application has been presented, detailing its scenes, features, and interactions. As the journey to rehabilitate refugee and immigrant offenders progresses, heartfelt appreciation is extended to the dedicated developers, testers, and supporting agencies who have played a vital role in making TRAIVR a reality.

Contact Us

For any inquiries, feedback, or support, please don't hesitate to contact our team. You can reach us at our website at http://becureglobal.com/ and support mail http://support@becureglobal.com

Thank You

Your time, interest, and commitment to the TRAIVR project are sincerely appreciated. Together, lives are aimed to be transformed, one VR rehabilitation scenario at a time.

Erasmus+

TRAIVR
Training of Refugee Offenders
by Virtual Reality

BAŞKENT ÜNİVERSİTESİ

ANKARA DENETİMLİ SERBESTLİK

IPS INNOVATIVE PRISON SYSTEMS

European Strategies Consulting

becure