Computing Science Department, Douglas College

Virtual Reality Training Simulator for Child and Youth Care

Nathan Aung Khant Min

Introduction

This Training Tool is a Virtual Reality (VR)-based simulation designed to enhance experiential learning for students in Child and Youth Care programs.

By using high-fidelity animations and instructor-provided dialogue trees, the tool allows students to practice navigating complex, emotional and crisis scenarios in a safe, controlled environment.

This immersive approach bridges the gap between theoretical learning and real-world application, providing a risk-free space to develop essential intervention skills.

Objective

This research project seeks to:

- Determine whether an interactive VR simulation tool can be implemented for Meta Quest 2 and 3 using Unreal Engine 5 to enhance student learning.
- Develop high-fidelity facial and body animations to enhance immersion and improve student retention within the application.
- To showcase the capability of the application as a standalone native Android app on Meta Quest 2 and 3.

Methodology

This project follows a structured development process using **Unreal Engine 5.5** to create a VR-based training tool. The methodology includes:

- **Scenario Design** – Instructor-provided dialogue trees and flowcharts define the interaction pathways.
- **VR Development** – High-fidelity Metahuman models and animations simulate realistic child interactions.
- **Testing & Optimization** – Performance tuning for **Meta Quest 2** ensures smooth, immersive experiences.
- **Evaluation & Feedback** – User testing with students and instructors refines the system for effectiveness and usability.

Results

This research has led to a successful VR application that implements:

- High-fidelity facial and body animations using Meta Human in Unreal Engine 5.
- A Dialogue System that progresses based on the instructor's predefined scenario.
- An interactive Artificial Intelligence (AI) character with a dialogue system that adheres to the instructor-defined flowchart.

Discussions

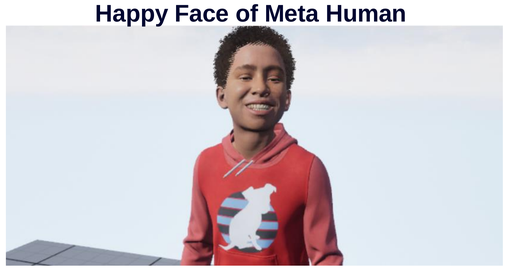
The resulting VR application demonstrates that developing a VR simulation tool is feasible, though not without challenges. One of the primary difficulties encountered was integrating Meta Human, a relatively new technology with limited documentation, which complicated the process of fine-tuning both facial and body animations.

Merging the facial and body animation types smoothly presented additional challenges, often leading to inconsistencies in character movement and expression.

Neutral Face of Meta Human

Distressed Face of Meta Human

Happy Face of Meta Human



Future Work

- Deploy the application in a classroom setting.
- Study whether this VR application enhance students' learning experience and engagement.
- Implement more facial animations to improve the range of emotions the AI Character can exhibit.

Conclusion

- This research successfully demonstrates the feasibility of implementing an interactive VR training tool for Child and Youth Care students on Meta Quest 2 and 3.
- High-fidelity facial and body animations were achieved even though there were some challenges with animation integration.
- The application was successfully showcased as a standalone native Android app.
- The successful implementation of this project demonstrates the high potential of immersive VR experiences as training tools in different educational contexts.

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