

# Nurse Practitioner VR Tool

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## PURPOSE

Nurse Practitioner VR is a training tool designed to offer student Nurse Practitioners (NP) an immersive learning experience through simulated consultations with MetaHuman patient avatars. Its objective is to provide student NPs with a controlled setting to practice their communication, history taking and diagnostic skills crucial in real-world clinical environments.

During a scenario session, student NPs engage in consultations with patient avatars and conduct a practice Objective Structured Clinical Examinations (OSCE). These examinations serve to evaluate their proficiency in patient interaction and effective diagnosing of medical conditions.

## PROJECT DETAILS

The current prototype consists of one OSCE scenario in which the student NP is asked to conduct a focused history and brief counseling to a pregnant patient exhibiting symptoms of headache and swelling.

The scenario mirrors the traditional OSCE experience, providing a realistic training ground for the student NP examinee. It includes a scenario brief outlining patient situations, examinee instructions, and a Metahuman patient and examiner avatar. This setup enables student NP examinees to engage in interactive conversations with the patient, execute their OSCE tasks, and formulate a diagnosis.

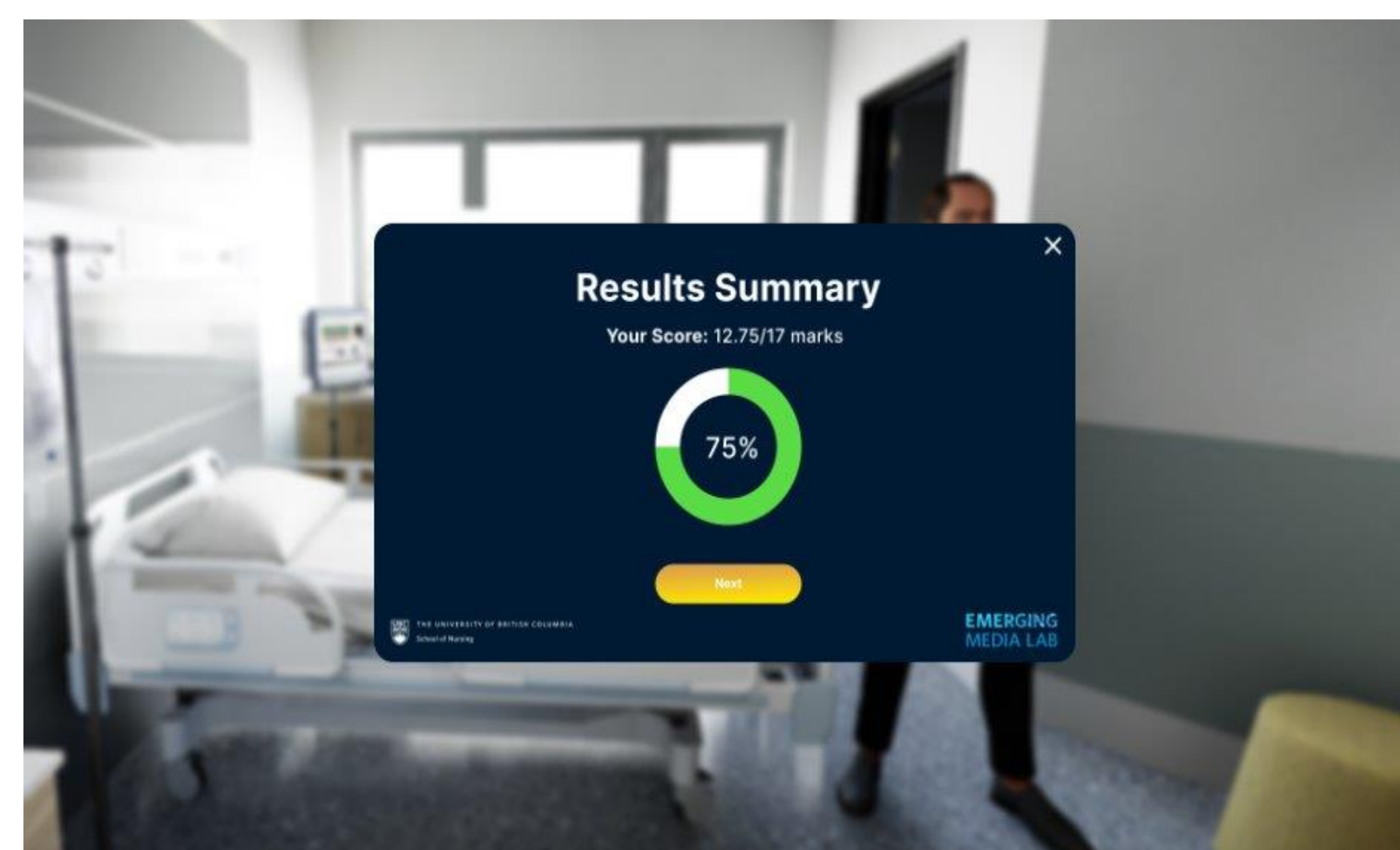


## PROCESS

### Development

The prototype is developed on Unreal Engine 5.3.2 and runs on Meta Quest 2 and 3. MetaHuman Creator was leveraged for realistic avatar animations. The prototype employs NVIDIA Audio2Face and LiveLink for facial animations, and Mixamo for body animation of the avatar.

To facilitate dynamic conversational AI and a speech-to-speech knowledge base for the patient avatar, the project integrates prompt engineering with OpenAI Large Language Model (LLM). Subsequently, the OpenAI results scoring algorithm evaluates user performance in accordance with the OSCE's rubric and provides student NPs with a final score at the end of the session.



Result Summary Board at the end of the scenario

### Design

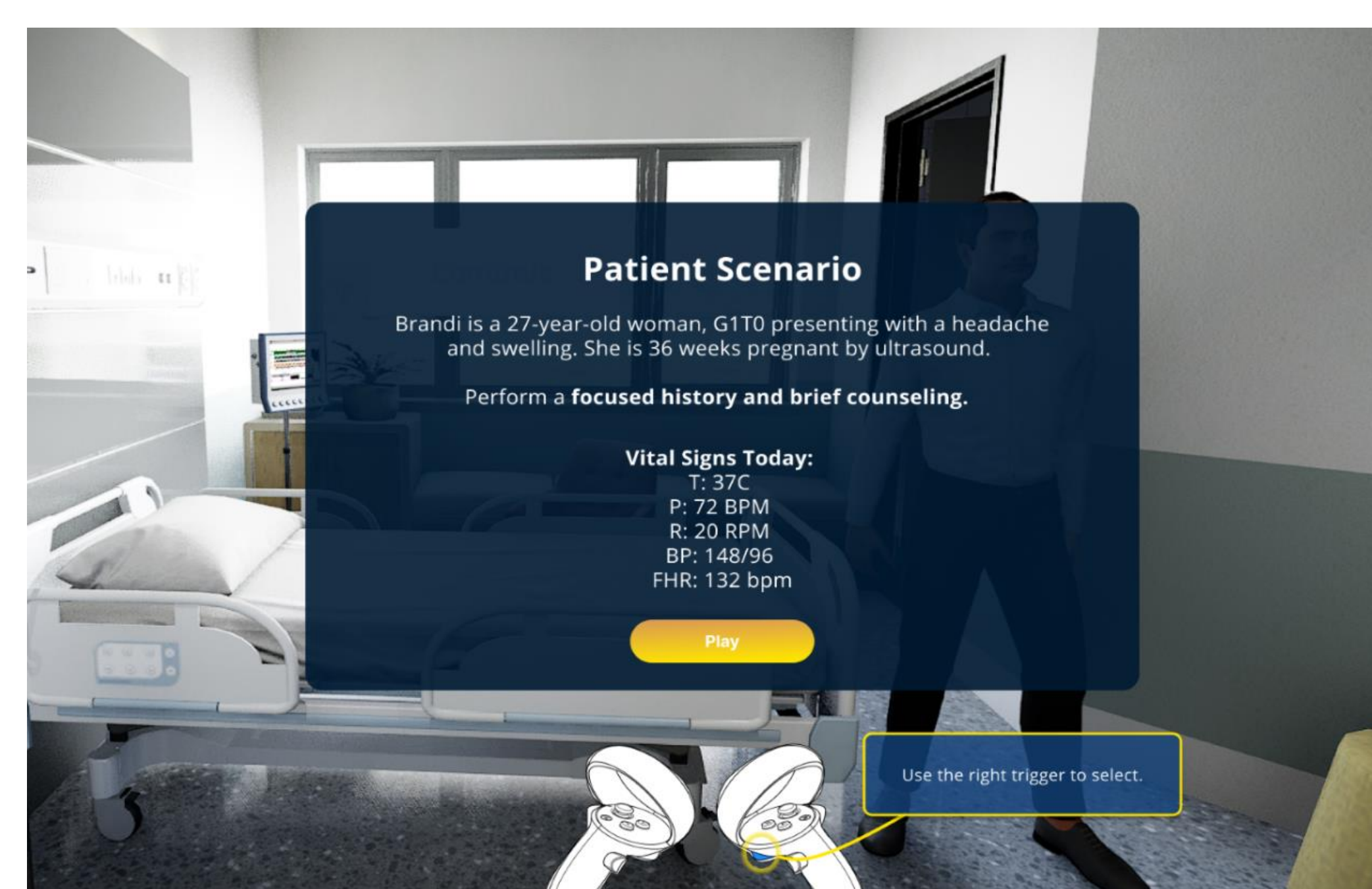
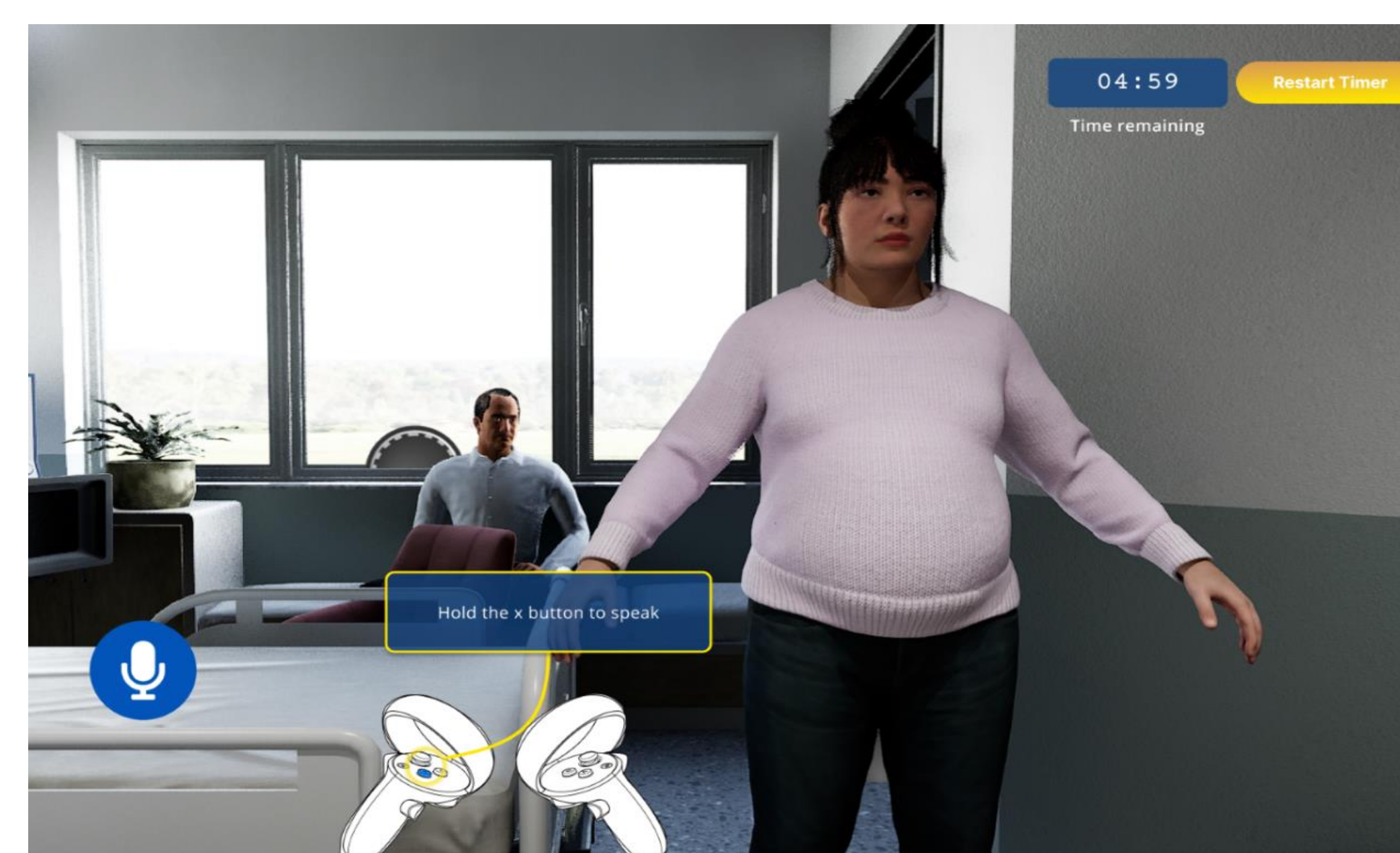
The visual assets and user interfaces were designed using Figma and implemented into Unreal Engine.

This included menu screens, tutorial screens, a scenario brief screen, a result screen, and various visual indicators intended to aid in accessibility and user-friendliness of the prototype.

## User Research

A round of user interviews was conducted with student nurse practitioners at UBC. The goal of this research was to capitalize on the domain expertise of student NPs and gain insights into user experience of the prototype and how well the VR tool aligns with healthcare educational standards.

One notable insight gleaned from these interviews pertained to the necessity of immediate feedback in avatar communication. The student NPs expressed a need for clear visual cues that the patient avatar had acknowledged their response. Consequently, a visual indicator for the voice activation interface was added, along with indicators for listening and processing actions. Clear instructions to deactivate the interface were also provided to ensure optimal user engagement.



## KEY FEATURES

- Lifelike Metahuman avatars
- Facial animation of the avatars using NVIDIA Audio2Face and LiveLink
- Body animation of the avatars using Mixamo
- Speech to speech system using OpenAI
- Result scoring algorithm using OpenAI
- Visual assets and user interfaces

## NEXT STEPS

Some of the next steps that the project might explore include:

- Integration of all high-fidelity user interface designs into the prototype
  - E.g. visual indicators of voice user interface and optimization of the existing GUIs to match wireframes
- Further development of the result scoring algorithm to allow for stored data and multiple practice sessions using the same OSCE scenario
  - Allows users to track progress over time
- Implementation of multiple OSCE scenarios for student Nurse Practitioners to practice with

## Acknowledgement

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