

2026-27 HIVE Summer Internship Project

Virtual Reality Training Tool for Risk Management and Situational Awareness in Healthcare Settings

Primary Academic Supervisor

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Project Background

Healthcare workers, particularly those providing community and home-based care, face occupational risks that can be complex, unpredictable and difficult to manage. Staff may work alone in unfamiliar environments without the immediate support, security or clinical infrastructure available in hospital settings. These risks can include verbal abuse, intimidation, physical aggression and other situations that threaten worker safety and wellbeing.

Conventional training approaches, such as classroom instruction, e-learning and physical simulation, are valuable for developing theoretical and procedural knowledge. However, they may have limitations in preparing workers for dynamic, high-pressure situations where rapid assessment, situational awareness and decision-making are required. Physical simulation can provide more realistic experiential learning but may be resource-intensive and difficult to scale, particularly for geographically dispersed community-based staff.

Virtual Reality (VR) offers a promising approach to addressing this training gap by enabling learners to experience realistic and potentially high-risk situations within a safe, controlled environment. Previous applications of VR have demonstrated its value in clinical, procedural and emergency training, as well as in developing non-technical skills such as communication and de-escalation. Many existing VR healthcare applications remain focused on hospital-based or clinical procedures and have a limited focus on the situational awareness and risk-management skills required by workers operating in community and home-care environments.

In consultation with the project's industry partner, South Metropolitan Health Service, this project will explore how immersive VR training can be used to recreate relevant workplace scenarios and support community healthcare workers in recognising, assessing and responding to occupational hazards.

Project Description, Expected Outputs, Possible Stretch Goals

Project Description:

This internship project aims to develop and evaluate an immersive Virtual Reality (VR) training prototype to support field-based community healthcare workers in recognising and responding to common occupational risks encountered in their work environments. The project will draw on literature, stakeholder input and existing workplace safety knowledge to identify key hazards and translate them into realistic, interactive VR scenarios.

The student will contribute to the design and development of a functional prototype using Unity, deployed on the Meta Quest platform. The VR experience will guide users through simulated scenarios involving hazard identification, decision-making and structured feedback, supporting the development of situational awareness and safer workplace practices.

Expected Outputs:

- A review of common occupational risks faced by field-based community healthcare workers.
- Identification and prioritisation of key hazards suitable for representation in VR.
- Design of interactive and immersive training scenarios based on selected occupational risks.
- A functional VR prototype developed in Unity and deployed on the Meta Quest platform.
- Interactive visualisation of realistic workplace environments, hazards and user decision points.
- Implementation of user interactions for hazard identification and decision-making.
- A structured feedback mechanism to provide users with guidance on their responses.

- Usability and functionality testing of the prototype.
- Documentation of the design, development process, evaluation findings and recommendations for future development.

Possible Stretch Goals:

- Addition of adaptive scenarios where the environment changes in response to user decisions.
- Implementation of performance tracking and visualisation of user responses.
- Development of a scoring or competency-based feedback system.

Links to background reading and any relevant recent work in the field

<https://www.youtube.com/watch?v=0XdA9cH81qY>

What type of visualisation will the student develop or produce?

The student will develop an immersive VR experience using Unity and deploy it on the Meta Quest platform. The experience will recreate realistic community and home-care environments, incorporating interactive workplace hazards and scenarios that allow users to identify risks, make decisions, and receive structured feedback.

How will the visualisation contribute to your research outcomes?

The VR visualisation will support my research focus on translating engineering and digital technologies into practical healthcare solutions. By converting identified occupational hazards into realistic, interactive VR scenarios, the project will demonstrate how immersive technology can address a real-world healthcare need. Evaluation of the prototype will provide insights into its feasibility, usability and potential for future healthcare applications.

If the project is successful, where would you consider publishing the results?

A conference

Draft Project Timeline:

Week 1

Nov 16 - Full day HIVE induction

Nov 17 - Area and Project Induction with Primary supervisor

Develop project plan with HIVE and academic team

Literature and relevant project review

Project Familiarisation

Week 2

Meeting with SMHS, Identify the Scenarios

Week 3

VR environment and interaction design - develop storyboards/user flows; identify required 3D assets, hazards, interactions and feedback mechanisms. Scenario storyboard and VR design

Week 4

Unity development – environment and assets - create/import 3D environments and objects; configure the Meta Quest development environment.

Week 5

Interactive scenario development - implement hazard identification, user interactions, decision points and navigation within the VR environment.

Week 6

Interactive scenario development - implement hazard identification, user interactions, decision points and navigation within the VR environment.

Week 7

Feedback and prototype integration - implement feedback, scoring/performance indicators and complete the core VR training workflow.

Week 8

Testing and evaluation - conduct functionality and usability testing; identify technical issues and collect user feedback.

Week 9

Focus on report writing and presentation (including demo) preparation

Week 10

*Focus on report writing and presentation (including demo) preparation
5th Feb Final Showcase Day and final report due*

Student Experience and Supervision:

How often will you meet with the student over the 10-week period?

Weekly meetings, with additional meetings scheduled as required.

Your work desk location and the location of student desk

314.463, 314 4th Floor

Student Attributes:

Please indicate any preference for student's academic discipline or field of study

NA

What competencies are required to start this project

Beginner - 3D modelling software (Blender, 3ds Max)

Beginner - Game engine development (Unity, Unreal. Godot, etc.)

Beginner - Virtual Reality Development (rendering pipelines, scene content design, interaction)

Do you have any other student attributes you think are important to the project?

NA