Report On potential of the VR Simulation for Informed Practise with children

# Initial project Assessment

The VR simulation for informed practise with children is a self-reflection and assessment tool. It is to be used with 1st year university students as part of a semester long course, where the tool will provide them the opportunity to practise assessing a children’s environment for Strengths and Challenges. Students will use this opportunity to also look at their own biases in how they assess environments in specific ways. As an example, the provided transcript from a focus group shows a significant bias towards negatively judging clients instead of acknowledging the strengths and challenges of the children’s environment. The VR Sim is intended as a tool to jumpstart these conversations and provide evidence to assist students in unpacking their own biases and tendencies.

When brought on to the project in April of 2019, our small team was tasked with refining the prototype put together by the previous placement team. We quickly identified several Key targets to meet:

## Reacquire and relocate the Git repository:

The previous team had used a private repository under the control of the previous programmer, William Holman. Additionally, they had local repositories on the three available VR development PC’s. On the first day one of those PC’s needed to be formatted and the local repository was lost. As such, we resolved to create a new Online Repository under the control of Shepard Masocha. By the end of our placement Shepard will be in control of the repository and able to add new members to it as new placements take effect

## Refine initial prototyped design:

As with the focus group, the initial design pass showed a tendency towards negatively judging clients. This was most clear in the Design documents language and discussion of ‘finding evidence of abuse’. As such, the design was refined to remove as much of this negative bias as possible. Rather than defining specific points of interest in a scene such as knives, the current philosophy focuses on tracking a participant’s approach to the assessment. The team removed extraneous tools such as ‘examining’ objects as that encourages unwanted behaviour in participants (note: social workers do not generally walk in to a clients home and pick things up to look at their labels). And refocused on tracking metrics such as where a participant looks and how often they look at those spaces.

## Transition original prototype to 360 video

The original prototype was developed to use a single 360 degree still image. This approach meant that more complicated scenarios for users would never be implemented and hampered further development. Additionally, multiple scenes needed to be implemented into the new prototype over one static scene. These two tasks were combined into one target.

## Refine User Interface

The clients focus is on a clear, lifelike approach to the sim. Ideally there should be as little ‘video gamey’ interference as possible. Instead, students are required to experience the scene in as close a way as possible to real life. All extraneous UI elements should be removed and new ones should be implemented in a non-intrusive way.

## Ability to load up previous metrics

This was established as a stretch goal. The clients requested the ability to save and reload sessions up as necessary.

## Establish a clear direction for future development

Finally, the team was tasked with creating a baseline that future teams could use for further development. The team established two unique vectors to approach this target. Firstly, a comprehensive documentation phase. One 6th of the time spent on the project was to be devoted to documentation and assessment. This included refactoring the project for future users and attempting to clear any extraneous files from the project. Secondly, the team focused on implementing an initial pass on an ‘interactive’ scene. The interactive scene is intended as a side stream of development, hopefully pulling all the behaviour from the 360 video scenes while also allowing participants to move around and inspect scenes. It requires a large chunk of time from the art department to implement the basic scenes first.

# Final project Assessment

After six weeks the current state of the project is summarised as follows:

## Git repository:

The git repository was recreated on the first day of the project and subsequently used for the next six weeks. On the final day of placement control was placed into Shepard’s GitHub account.

## Refine Initial Prototype:

The extraneous elements of the design were removed early in development. Testing was conducted on an ongoing basis to ensure anything intended to replace old functionality worked. The Current implemented features are as follows:

*Head tracking –*

The current version of the project records the point that the headset is looking at every .1 of a second. At the end of a session users are given the ability to display this metric as a line render of how their vision progresses around the room. This line render has points on it that show the timestamps for their assessment.

*Heat Mapping –*

Heat mapping uses the recorded data from head tracking to assign places of high and low interest in the scene, showing how often participants would return to looking at certain parts of the scene. Again, this is a metric that can be displayed at the end of a session.

*Sound priming –*

The initial main menu uses a basic ‘puzzle’ looped track to try and prime participants towards being inquisitive rather than antagonistic. As per the clients instructions there is no audio intrusion into the actual assessment scene excluding some basic audio for UI interface interaction.

## Transition to 360-degree scenes

The current build had three distinct scenes for users to transition too. Each scene tracks its own metrics so that when users finish their session they can visit each scene and observe the different approaches they took to the scenes. Additionally, each scene plays a full 360 degree rendering of the supplied video files, audio included. This could potentially allow future designers to record new scenarios for students to participate in and plug them in as necessary, allowing faculty and designers to create staged and ramped sessions that present students with increasingly more chaotic scenes to assess.

## Current UI

The current user interface builds on the previous implementation. It can be turned on and off by holding the trackpad for a moment, and users interact with the buttons through single clicks now. When the interface is on it is stationary in the scene but tracks to the players head position so they can always read it.

## Ability to Load previous Sessions

The current build has a load and save feature that allows users to save their session and load up new ones. These options become available when the user ‘finishes’ the scene.

## Future Development base

This report is part of the base for further development. It helps to communicate any needed information to the following designer and any stakeholders interested. Additionally, the GDD is up to date, as is the TDD. Finally, code refactoring has been taking place over the full 6 weeks.

The artist department suffered a small set back due to personal issues but has still made progress on the interactive scene. A second pass grey box will be in to the scene by the end of placement. Additionally, there is some basic functionality in the scene. It is a far off from being complete and simply transposing the 360-degree functionality will not work unfortunately. These issues are detailed in the GDD.

# Potential future branches of development

The unique challenge of this project comes from a complete lack of doctrine or policy put forward by social workers regarding how an assessment takes place. Functionally, when asked for things to track a ‘good’ assessment versus a ‘bad’ assessment a social worker is apt to be puzzled by the need for such things. They view that sort of ‘objective’ approach as contrary to their job and more of a psychologist’s field of expertise. It seems to be a point of pride in fact that each social worker focuses on their own way of doing things.

To most social workers asked about this, there is no ‘right’ way to assess a client’s home. No specific approach. There are plenty of specific wrong ways to do it though. An that is the challenge. Every social worker asked about this process so far will very quickly tell you how not to assess a child’s home, but when asked about the commonalities of doing it properly they will look at you blankly. The best example comes from a Marguerite McCann. It took half an hour of conversation to establish that when inspecting a home, the first thing she always does is sit down. In theory, this act gives her a moment of calm. If she’s sitting down someone is going to ‘attend’ her, and that low energy interaction affords her time to look around the space and assess it. Finding basic habits like this in other approaches would be the key in defining new metrics we can measure for students. There are 3 key areas that have been defined over the last 6 weeks that could be further developed in new and interesting directions.

## Continued work on the interactive scene

The interactive scene affords a number of possible metrics to measure in students behaviour. Initially there is simply the ability to measure where a student moves in the space. By itself we would be able to show how long they spend in certain places as well as where they look from those places. With the proper input from staff and faculty it may even be possible to define key points in the scene that students should be assessing from. The process of finding those points and using them provides more data about how a students assesses the environment.

Further, the interactive scene could allow students to practise interaction with clients while in the space through more traditional elements of game development, such as ai actors in the scene with programmed behaviour. While the fidelity is unlikely to ever reach ‘realistic’ standards, it will still afford new opportunities to examine students biases and approaches to situation.

## Potential scenarios through 360 videos

The 360 videos present a unique opportunity. If Designers could get involved with the actual recording of sessions, then they could craft more complicated scenarios that take place as users watch. Additionally, this affords them the opportunity to have a more graded approach to the session’s users experience through a ‘levelled’ process. They could have initial, calm spaces, and then on further sessions introduce actors moving around within the space. In final iterations they could potentially have actors talking directly to users and asking them questions Which serve as distractions while things happen in the background of the scenes.

## Potential metrics built on concrete, objective goals

Finally, a further element of development could be to work closely with experience social workers and to try and define a framework that shows what a good assessment of an environment requires in a behavioural sense. A framework that defines how a social worker looks through the space would afford more metrics to track and reveal new ways for users to interact with the scenario.

# Potential Blockers of future Development

## Hardware limitations

The current build is designed and implemented for use with a Samsung Gear VR. The Samsung Gear VR hasn’t specifically been discontinued, but there hasn’t been any move to develop the technology much since 2017. Samsung and Oculus have stated in 2019 that they are still partnered and working to support the headset, but they haven’t released any updates on it. There is the potential that in the future the headset may become unfit as a platform to deliver a curriculum required course.

*Possible Solutions*

If the Gear VR fails to provide the functionality required from it, then it would be quite easy to port the project over to the Oculus Go. This is a standalone piece of hardware that is currently in development by Oculus and has shown a healthy number of updates in the last few years. Additionally, there are many other stand alone headsets available such as Google’s Daydream View Mobile Headset.

## VR Sickness

VR Sickness is still a prevailing problem for many people. A student that suffers from VR Sickness is effectively cut off from the tools they would need to improve. In that situation, it is the Universities responsibility to provide alternatives

*Possible Solutions*

Currently there is a 360-degree video of the scenes that has been stitched together for upload on YouTube. While this doesn’t provide the functionality of the prototype, it does at minimum provide the students some opportunity to experience and understand the discussions that are prompted by the VR Tool.

Additionally, further placement teams could be tasked with developing an AR version of the tool. It would function in a similar manner to the Debug version of the current tool on mobiles (the debug version of the build can be accessed through the services menu on the phone in the VR section and provides the full functionality of the app without a user needing a headset. It functionally acts as an AR viewport)

## Limitations of the development process using placement teams

Currently there are three computers available to work on the current project. These computers must be shared amongst the placement team. However, for future development there is a clear need for a team with more than one artist, in order to help flesh out some of the other avenues of development. In a six-week period it may be possible to have a relatively well modelled single room, or a first pass on a rig.

*Possible Solutions*

Providing more art students to teams could help alleviate some of the mounting art work and allow quicker progress on some of the development avenues available. Alternatively the University could hire some freelance artists to work with placement teams.