

Business Case

Proposed Project

ArachnoTherapy VR - ENSE 400 / 477 Capstone - Team Edentata

Date Produced

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Background

The greatest advantage that VR brings to exposure therapy is that it can display environments that the brain interprets as three-dimensional. This is useful for a few reasons: firstly, VR can act as an alternative in situations where real-world exposure therapy is impractical or impossible, such as air travel or being in the ocean surrounded by sharks. However, even in cases where real-world therapy is practical, there is still usually no way to control the behaviour of what is causing distress to the patient. This means that progression is difficult to personalize. In a virtual simulation however, this is not an issue. Even if the user assumes on a subconscious level that what they are seeing is real, it is not actually real, and poses no legitimate danger. As such, virtual environments are guaranteed to be safe and controlled, which creates a strong basis for exposure therapy.

Furthermore, in VR, it is relatively easy for menial tasks, such as picking up objects and moving from room to room, to be performed. In addition, it is straightforward to implement these tasks such that they escalate in intensity, and follow a level-based progression system. The process of acclimating to a stimulus that normally elicits anxiety is similarly gradual. Patients can tolerate various levels of exposure at different points along their journey to overcome their phobia. Thus, the paradigm of gamification is both applicable and beneficial to this project.

VR exposure therapy has been around and explored extensively over the past few decades, primarily through research projects, but also through more than a few commercial endeavours. The main reason why none of these commercial products have taken off is that, for the most part, the user can only interact with the VR environment in a passive manner. In other words, they cannot do much more than just look around and watch things happen. In order for a VR experience to be an effective therapy tool, the user needs to be convinced of two things - that the environment itself is a physical location, and that the events taking place in the environment are legitimate and bear real consequences.

Business Need / Opportunity

We see an opportunity to improve upon past VR experiences used for exposure therapy by situating the user in well-constructed rooms with motion-based control schemes, rather than unrealistic or overly abstract spaces with passive interactions. Finally, conducting therapy in VR opens the door for real-time involvement on the part of the user's therapist, whether by observing the user's visual perspective and real-world disposition passively, or directly manipulating elements of the environment in accordance with their patient's comfort level. This gives users a chance to make progress at their own pace, and immediately apply coping

strategies that they learn from their therapist. The primary use case that we envision for our application in the context of business.

Options

Option A: Focus on implementation requirements above all else

Option B: Focus on design / psychiatric requirements above all else

Option C: Adhere to equilibrium between implementation and design requirements whenever possible

Cost-Benefit Analysis

Option A

- Benefits
 - Higher likelihood of clean code
 - Lower likelihood of feature-itis
- Costs
 - Potential to “miss the mark” when it comes to effective therapy design

Option B

- Benefits
 - Higher likelihood of creating effective therapy tool
 - Enhanced understanding of psychology components
- Costs
 - Potential for code smells and feature-itis due to the expanded high-level design space

Option C

- Benefits
 - Higher likelihood of creating effective therapy tool
 - Enhanced understanding of psychology components
 - Prevention of feature-itis (design will be governed by implementation and vice versa)
 - Expansion of advisors (potentially more use cases / carryover groups)
- Costs
 - More time spent in planning phases
 - Potentially increased design complexity

Recommendation

Option C is the intended course of action, as it will enable us to focus on designing a therapy application that is actually beneficial while not sacrificing proper software design principles.