جامعة نيويورك أبوظبي

NYU | ABU DHABI

Immersive Experiences
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Perspectives — Interactive Game on VR and Empathy

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Abstract

Perspectives is an interactive game based on immersive narrative concepts — spatial audio and virtual reality (VR) embodiment — and emotional education. The goal of *Perspectives* is to foster empathy through a first-person experience of gaining new perspectives when performing an unknown task in an uncommon environment. We use Three.JS to implement the idea in WebXR and low-cost Google Cardboad VR lens with a mobile device as a head-mounted display to make the experience more accessible for the greater audience. Although a larger user-scope and post-experience surveys are required to document the empathy data, *Perspectives* follows the general principles of emotional education in VR outlined by previous research of Jeremy Bailenson in his '*Experience on Demand*'.

Keywords: immersive experiences, virtual reality, emotional eduation, empathy.

Introduction

As outlined by Jeremy Bailenson in his '*Experience on Demand: What Virtual Reality Is, How It Works, and What It Can Do*', "immersive properties of VR make it particularly suited to sharing the experiences of others, to deepening our understanding of lives outside our own" (78). Hence choosing VR as a medium is a conscious decision to test the game idea in the context of immersive experiences. In particular, we aim to utilize the second and the third definitions of empathy proposed by Bailenson and Zaki. Empathy as "the ability of the brain to form theories about what other people are feeling" and a "full-fledged empathy", when one is presented with a choice to "alleviate the suffering" of another (80).

Perspectives is a geometry universe that has three world levels of play — 2D world, incomplete 3D world, and the complete 3D world. The user is presented with an obscure task to complete a "geometry cycle" — but not revealed what the cycle is and how to make it. The game starts with a placement in the 2D world, where the user can navigate and learn more about the environment with the use of immersion elements and cues to advance to another level. With each level revealed, the user gets more information about the world and gains new perspectives as a result. If successfully passed through all levels and completed the task after gaining more context about the geometry universe, the user is encouraged to stay open to new perspectives and information when learning by the immersive audio experience.

By placing the user into the first-person experience of uncertainty and suffering in navigating *Perspectives*, we create an opportunity to experience what other people might have to go through when learning new information and navigating a new environment. The premise of the project is that participants will continue the process of mindful reflection to achieve the "full-fledged" empathy after the experience. Further research in exploring the influence of *Perspectives* in making empathic decisions is required to find the correlation.

Methods

To create a VR experience supported on Google Cardboard, we decided to code a multi-page website to simulate a game. The website is supported on both desktop and mobile, but is mobile-first to enhance the experience. Three.JS and ES6 JavaScript were used as main programming languages for the experience, as they fully support 3D and mixed reality development on the web. In addition, viewing the experience on mobile is available on any Andoird device browser but is limited to XRViewer browser by Mozilla on iOS devices due to Apple software limitations. The complete codebase for the application is open-source and is available in the GitHub repository.

Results

While this was a short-term project developed just under three weeks, we were able to come up with the technical implementation for the interactive immersive environment.

The final world of *Perspectives* is the 3D environment with an octahedron-shaped planet in the center. The user is initially placed in 2D (triangles) and 3D (pyramids) sub-sections of the octahedron when performing the task to gain the "full" 3D octahedron perspective. They first explore the areas before having to complete the task. Navigation to each upper level suggests gaining more perspective and context into the task that they are doing.

The complete navigation process looks as follows:

- Level 1 — eight triangle faces of the octahedron,
- Level 2 — two pyramid sub-sections of the octahedron,
- Level 3 — the complete octahedron.

The complete experience is hosted on the web-page and can be accessed on desktop and mobile. The video demonstration of the project is also available on YouTube.

It is crucial to note that further psychology research is necessary to test the hypothesis behind fostering the full-edged empathy after playing the game. Potential study trials can be completed with post-experience surveys, asking participants to reflect on different scenarios requiring active use of empathy and compassion skills.

Discussion

VR as a medium certainly places limitations in using empathy as a learning tool. With cases of compassion-fatigue and cheap-sentimentality (Bailenson 2018; Sutherland), it becomes more difficult to create educational experiences that can influence one's decision-making, especially in the direction of positive psychology.

Another important note is that *Perspectives* went through many technical and visual iterations to make the experience more immersive and user-centric. Despite the original intention

of keeping the game obscure, we applied some modifications based on user-tests to add some clarity to the experience process. After completing two user tests on June 10, 2022, it was decided that the geometry world will be simplified, going from the icosahedron world to the octahedron world. From additional user feedback on Jun 13, 2022, we decided to add some visual and text cues to complete the task. While still obscure enough to sustain the premise of the game, the experience is now more intuitive. When completing the final version of *Perspectives,* however, we have discovered that the task can still appear complicated to users without background knowledge in geometry. Simplification in the user-experience is something that we plan to improve upon in the future versions of the game.

A crucial debate in immersive experience technology is the one on VR and inclusion. We believe that it is important to keep *Perspectives* open to improvements and are committed to making it more accessible by adding subtitles to the audio cues and option to change the environment colors to help people with low vision or color-blindness.

Implications

Perspectives raises an important question and adds to an ongoing debate in creative development and empathy — *can virtual reality games influence people to make empathic decisions?*

While we are unable to answer this question by ourselves with this single project, we believe that it has potential to contribute to the research in emotional education and technology. An example of current-day experiments on VR and empathy is Grasse, K. M., Cuerdo, M. A. M., & Melcer, E. F.'s *Mad Mixologist* which explores collaborative interaction as a result of understanding perspectives of one-another and empathic decision-making.

We believe that VR and immersive experiences, especially that of empathy and compassion, have a lot of potential in further applications in emotional education and research.

References

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2. Sutherland, Ainsley. "The Limits of Virtual Reality: Debugging the Empathy Machine." http://bit.ly/1MF8zp9
3. Grasse, K. M., Cuerdo, M. A. M., & Melcer, E. F. (2021). "Mad Mixologist: Exploring How Object Placement in Tangible Play Spaces Affects Collaborative Interaction Strategies". In Proceedings of the IEEE Conference on Games. COG '21, Copenhagen, Denmark.

Appendix

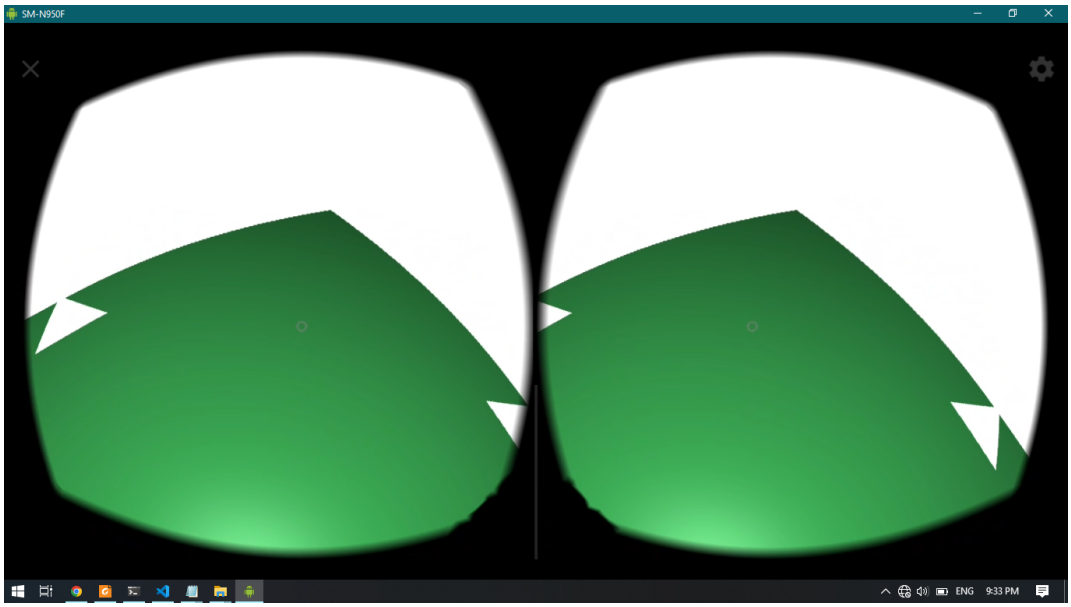

Image 1. *Perspectives*. Level 1.

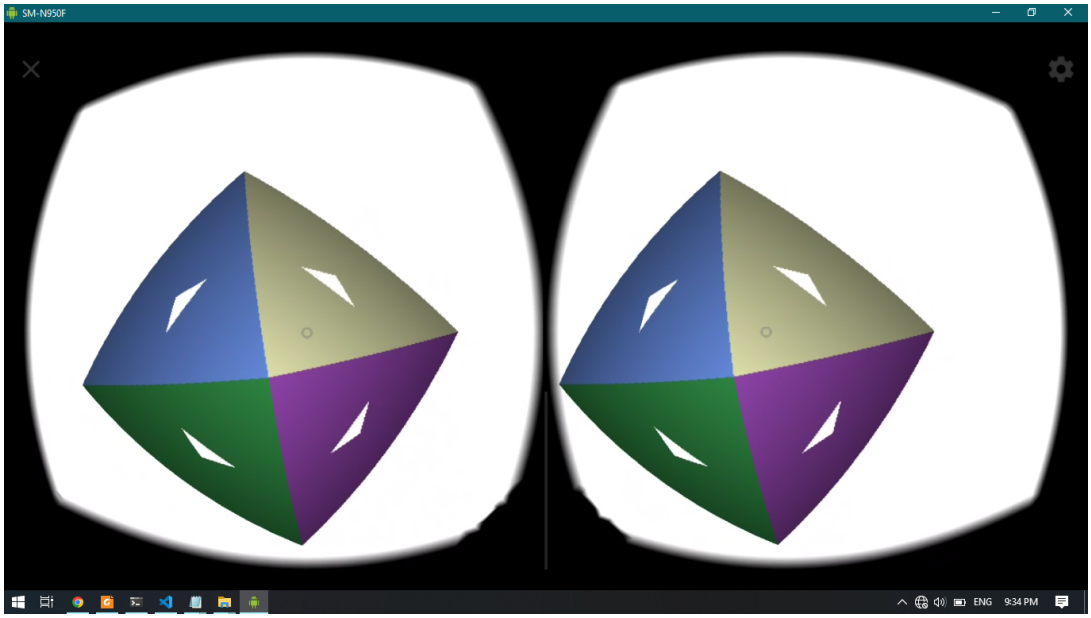

Image 2. *Perspectives*. Level 2.

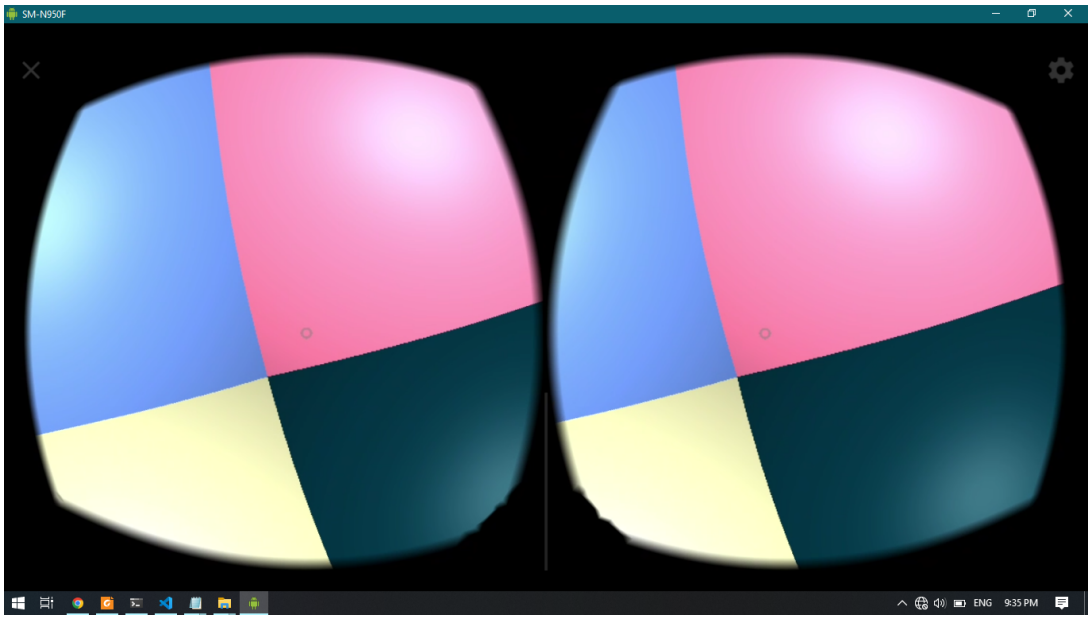

Image 3. *Perspectives*. Level 3.

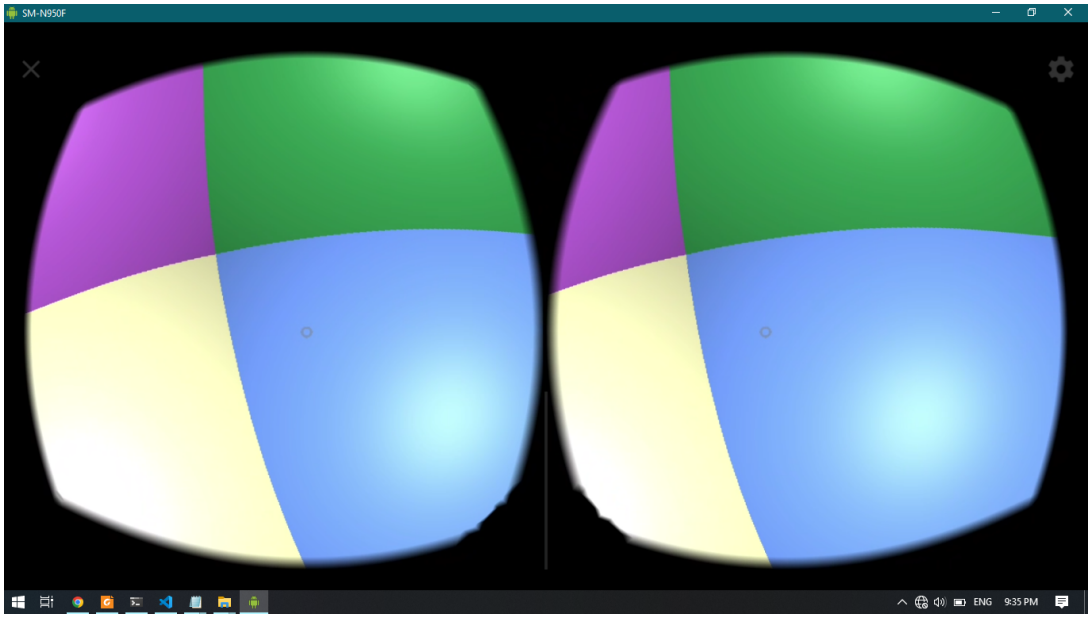

Image 4. *Perspectives*. Level 3 (different angle).