Creating a VR Experience of Solitary Confinement

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Abstract

The goal of this project is to create a realistic VR experience of solitary confinement and study its impact on users. Although there have been active debates and studies on this subject, very few people have personal experience of solitary confinement. Our first aim is to create such an experience in VR to raise the awareness of solitary confinement. We also want to conduct user studies to compare the VR solitary confinement experience with other types of media experiences, such as films or personal narrations. Finally, we want to study people's sense of time in such a VR environment.

Index Terms: [Human Computer Interaction]: Interaction paradigms—Virtual Reality; [Applied computing]: Law, social and behavioral sciences—Sociology

1 Introduction

Solitary confinement is a highly controversial topic, and there have been many debates and studies on its negative psychological and physical impact on inmates [2, 5]. According to ACLU [1], "Long-term isolation costs too much, does nothing to rehabilitate prisoners, and exacerbates mental illness - or even causes it in prisoners who were healthy when they entered solitary." However, "In the past 30 years, the United States has dramatically expanded its use of solitary confinement, even creating new "supermax" prisons designed to hold entire prison populations in extreme isolation." [1] Solitary confinement is also used in many other countries. For example, former Egyptian President Mohamed Morsi was placed in solitary confinement for 23 hours of each day for six years. In November 2019, a group of independent UN human rights experts reported that there was credible evidence that such prison conditions may have led directly to his death [8].

However, very few of the target audience of these reports, talks, films, and statements have experienced solitary confinement themselves. Can these types of media reports generate sufficient resonance among the audience? Can we create better awareness of what it feels in solitary confinement? Several years ago, a student at Georgia State University constructed a mock solitary confinement cell with plywood and invited people to spend time in it. Our work is inspired in part by that project.

This project has three main aims. First, we want to create a realistic VR experience of solitary confinement and study its impact on users. Second, we want to conduct user studies to compare our VR solitary confinement experience with narrative based VR experience. Third, we want to study people's perception of time and time manipulation techniques in VR.

This project is developed using the Unity game engine with the SteamVR plugin.

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2 Related Work

The most relevant previous work is the project "6x9: A virtual experience of solitary confinement," published by The Guardian in 2016 [7]. This VR environment simulates a 6' by 9' solitary confinement cell. (For simplicity, we will call it "6x9 VR".) "6x9 VR" is part of a news story and therefore focuses on narration. There is a voice-over, and texts are projected to the walls. Users can turn their heads, but otherwise have no interaction with the virtual environment.

Confinement is a short 360-degree VR film produced by Matthew Cooke that places the viewers in solitary confinement [3]. There is a voice-over for the entire film, with no interaction.

PBS Frontline published a short 360-degree VR documentary film "After Solitary 360" [4] as part of their longer documentary film "Last Days of Solitary." In part of this VR film, viewers are placed in a 13x7 solitary cell in Maine State Prison. There is a voice-over, a character is digitally placed in the cell, and texts are projected on to the walls.

The three above projects are documentary VR films that focus on storytelling, with little to no interactivity. We designed our project to be different from these previous work. Our project focuses on creating a realistic VR experience, with more interactions and no voice-over. In our VR, users may feel lonely and bored, with little to see and do, and we want to study how that feeling affects people. We also intend to conduct user studies to compare our VR (more interactions and no storytelling) with the documentary film VR (fewer interactions but more narrations).

There are other prison-themed VR games and simulations. But they are not relevant to our work because they do not feature solitary confinement, and their purpose is for entertainment or training. Therefore, we will not discuss them in detail.

3 System Design and Implementation

The VR experience was designed based as much as possible on the actual experiences in solitary confinement. A student who has spent time in solitary confinement provided much helpful feedback to our design, including the lighting, sound, the size and placement of the common items in the cell, daily routines, etc. For example, the student pointed out that the inmates in solitary confinement often have their one-hour exercises before dawn, which we integrated into our design.

There is no standard size for solitary cells. We based our design on a 13'x7' cell [6], which is the same dimension as the one used in the Frontline's "After Solitary 360" film, but slightly larger than the one in the "6x9 VR" project. The room has a door (with a window and a drop-down opening), a small window, a bed, a table, a toilet, and a sink. Lunch and dinner on meal trays will appear at specific times. We also created an open area outside the cell with stairs and doors of other cells. Therefore, users can take a peek through the window on the door and has a more realistic view. We also created an outdoor exercise area with fences.

For more realistic lighting, we used both realtime lighting, baked lighting, and Unity's Post-Processing Package, which allows us to implement features such as bloom (the glow around a light source) and depth of field (the change in appearance of objects as distance between the viewer and object increases).

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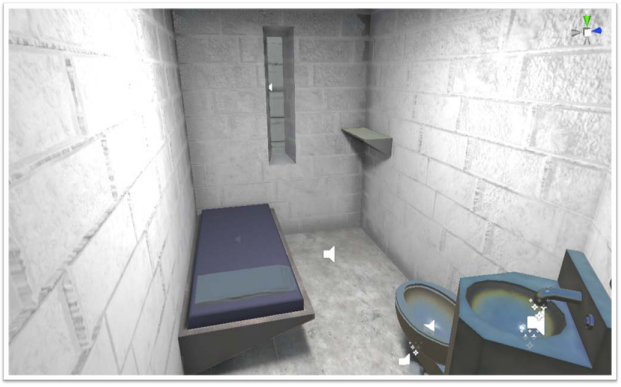

Figure 1: Solitary Cell

Figure 2: Open Area

Of equal importance to the visual design is the design and placement of sounds within the project. Beyond placing the sounds in accurate places and finding authentic sounds, the sound design of this project was enhanced even further through the use of a sound spatializer, namely Resonance Audio. This SDK gives developers access to more detailed settings and scripts for sound development in Unity. These settings include things such as enabling occlusion (sounds appearing differently when objects are between the user and the source), near-field effect (sounds appearing differently as the user approaches the sound source), and room effects (setting the materials of a room so that the echo and resonance appears realistic to the user).

Most necessary interactions in a solitary cell are implemented. We use the first-person view, without a player avatar. However, a user can see both hands. Users can walk around, turn on the faucet, and flush the toilet. When the food tray appears, a user can pick up food items. At the time of outdoor exercise, a user will be teleported to the outdoor area. The use of teleporting is due to the difficulty of simulating long walks in VR.

Figure 3: outside Area

One of the key issues in our design is time management and time manipulation. Each user will likely spend less than ten minutes in the VR, but we want them to feel longer. On a typical day, we imagined a prisoner would sleep for 8 hours, decreasing the total time of the experience to 16 hours. This results in an approximately 8-minute experience total, with each hour being represented by 30 seconds in VR. Within this approximate 8-minute experience, the time is separated into three distinct intervals: the first being the hour before the ”hour” of outdoor recreation time, the second being the actual ”hour” of outdoor recreation time, and the final being the remaining 14 ”hours,” punctuated by two meals. We are experimenting with different time manipulation techniques.

4 Preliminary User Study

We conducted some informal user studies. We asked about 15 people who have no solitary confinement experience to test our VR and took notes of their reactions. The vast majority of the users reacted with great interest and positive feedback. We heard comments like ”Wow, this is wild.”, ”Amazing,” ”Wow, this is how it feels.”, and ”Every kid should try this.” Besides, we asked two former inmates who spent time in solitary confinement to test our VR. One of them is the student who helped us design the VR. The first time, she put on the VR Headset but quickly took it off after just several seconds. She said, ”It’s real enough; I don’t feel comfortable.” And she never tried it again. Another inmate was able to complete the VR experience and said it felt realistic. He also commented on some of the design details.

5 Conclusion and Future Work

We have created a VR experience of solitary confinement to help raise awareness of this issue in general public. Our project is different from previous work in that we focus more on realism and interactions and less on storytelling. Our preliminary user studies were very encouraging. We plan to conduct formal user studies see whether the VR experience alters users’ opinions on solitary confinement. We also plan to conduct user studies to compare our narrative-less VR experience with the narrative-focused documentary VR films.

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