**Senior Project**

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Procedural Level Generation Using Impossible Spaces

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**OVERVIEW**

Movement in Virtual Reality (VR) has been an area of discussion for a long time as developers are experimenting with different methods of movements (i.e., Teleportation, Thumb-stick movement). However, every method comes with its flaws, whether an increase of motion sickness or a decrease of immersion. Hence, the purpose of this project is to shed some light on a new method of movement that maximizes immersion and almost completely eliminates motion sickness.

**GOALS**

1. To create a VR experience (preferably horror or escape room).
2. To use impossible spaces to generate an adaptive map/room around the player.
3. To procedurally generate the map/room to give the player the illusion of an infinite space.

**EXPLAINATION**

Impossible Spaces is a type of geometry that can be used in VR to maximize Immersion by physically walking in the play-area of the virtual environment which in turn also decreases motion sickness. This can be achieved by having self-overlapping architecture to give the illusion of an infinite non-Euclidean space.

**MILESTONES**

**Create A Simple Experience**

Before diving into the actual core of the project, a base-game must be created first such that everything else will be built around it.

**Add Procedurally Generated Levels**

As the player walks with the most-used type of VR walking (using thumb-sticks), the levels shall be procedurally generated around the player to give the illusion of an infinite area.

**Add Impossible Spaces**

The actual core of the project shall be achieved in this milestone, such that impossible spaces will be added within the procedurally generated map. At this point the thumb-stick movement will be discarded and the player will have to physically move in his/her actual play-area to achieve movement in the virtual world.

**Finish the Game**

By this milestone, the project shall be finished. The game will be upgraded from a simple walking-simulator experience to an actual game.