DIMENSIONAL DRIFTERS

Project number: 231317
Workshop: Games and Machine learning
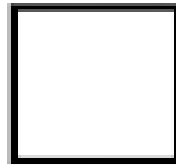Names: Natanel Shiff and Tal Ben Zvi
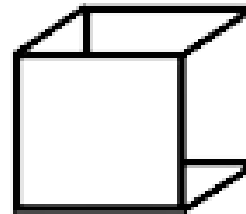Advisor: Uri Globus

The problem

Explaining and visualizing the concept of different dimensions in a fun and intuitive way
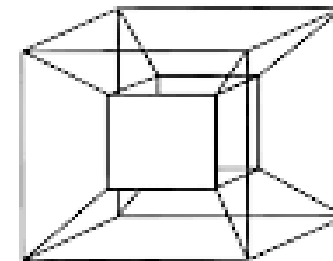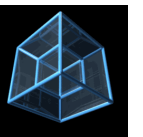
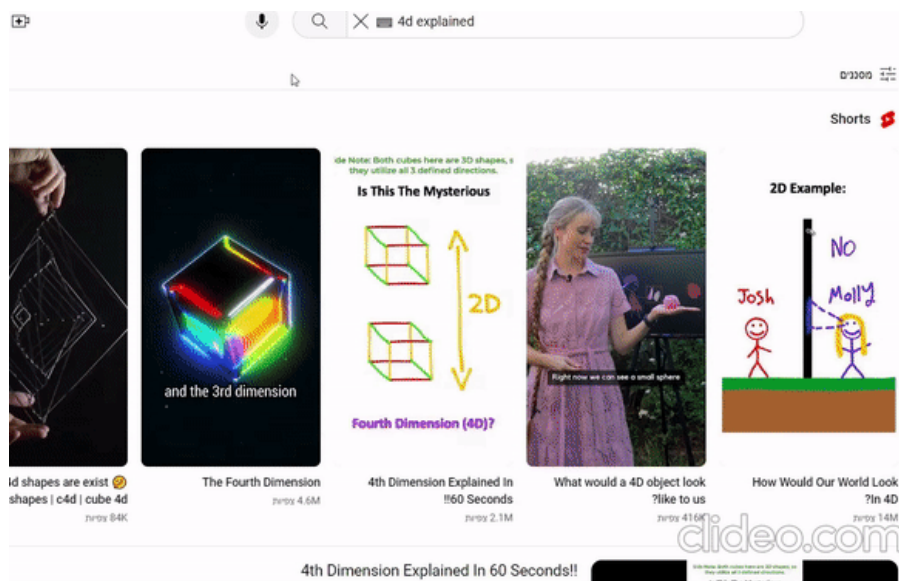1D (Line)   2D (Plane)   3D (Cube)   4D (Tesseract)

Remark: The fourth dimension is NOT time. If we count time as another dimension the game would be five-dimensional.

Target audience and interest

- Although there are no official statistics on interest in 4D games, a simple online search uncovers a big audience eagerly seeking experiences in a nearly non-existent market.

- The target audience is not just gamers, but anyone who wants to learn about and experience different dimensions.

Our solution

- Dimensional Drifters is a cross-dimensional puzzle game created with the idea of making the concept of different dimensions easily understandable and accessible through gameplay.

- The game builds an understanding of the different dimensions block by block by starting with the first dimension and going through higher dimensions gradually.

- The players get to see how the different dimensions interact with one another at first hand.
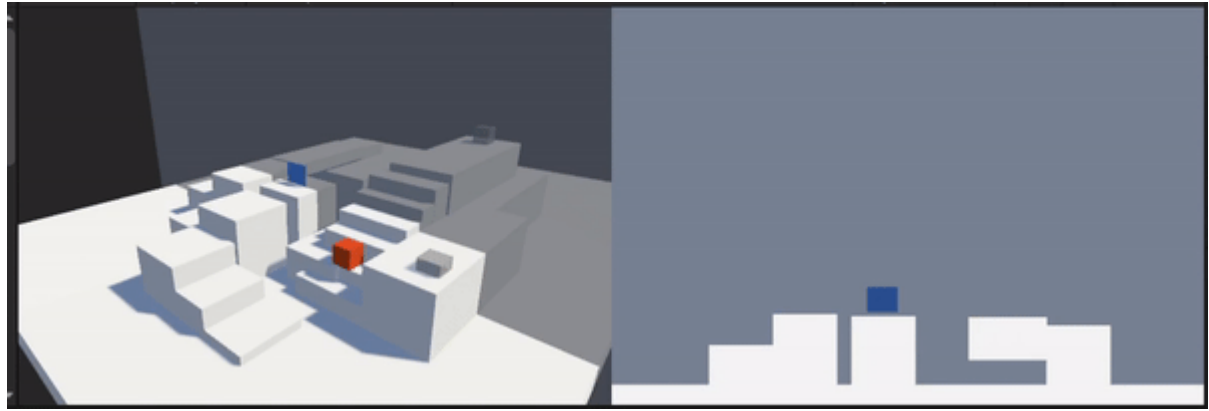
Demonstration

1D world

2D world

3D world with a dynamic 2D slice of that world
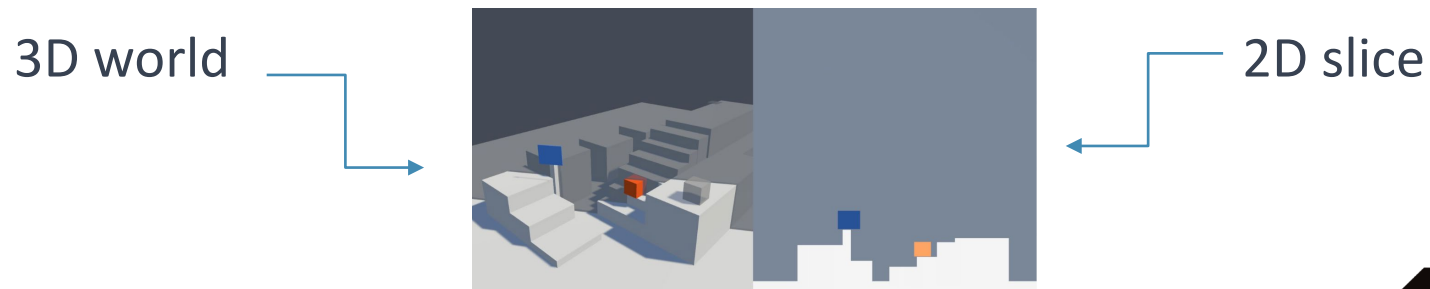
Technologies & Features

Technologies:

- Unity
- C#
- ShaderLab
- Git (GitHub, GitKraken)

Main features we implemented:

- All movement scripts for all the different dimensions.
- Scripts and Stencil Shaders in C# and ShaderLab which in run-time renders only relevant pixels of any colliding 3D object with a 2D world for the screen of the 2D player:

3D world

2D slice

Other solutions

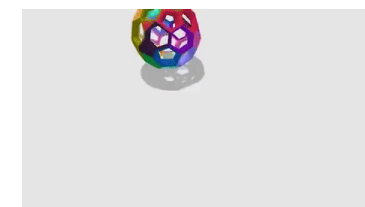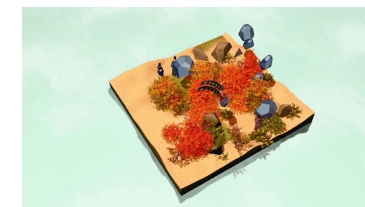Different methods to explain the concept of dimensions:

- Books (e.g. Flatland)
- Videos
- PowerPoint presentations
- Mathematical articles

None of these let you experience and visualize these differences for yourself like a game.

Existing cross-dimensional games

- Miegakure is an in-development puzzle-platform video game set in a 4D world, that has been in development since 2010.

- 4D toys – an app that lets the player play with 4D objects and see how they behave.

- Fez is a 2D puzzle platform game set in a 3D world, but limited to four fixed 2D slices of that world.

Those games do not explore the relation between the different dimensions deeply enough, focusing only on 1 or 2 dimensions and therefore struggle to explain the true concept of dimension. This is what makes our game UNIQUE.

To summarize…

- The concept and the understanding of 4D is still developing and growing

- There is a lot of interest in understanding the concept of different dimensions, but not enough tools to make the learning experience easier and more accessible.

- There are not many games exploring the concept, and none (that we could find) that are exploring the relation between the dimensions

- We didn't want to develop "just" a game, we wanted to educate and create a fun learning experience. We hope we achieved that.