

Light of Daedalus

– Game Proposal –

Game Idea

Light of Daedalus is a Virtual Reality puzzle game, where players have to hit a certain target with a light ray of a specific color. The ray is emitted by the player who is therefore equipped with the Light of Daedalus, which allows changes of the outgoing color progressively. However, obstacles and the target color complicate this task.



Image 0: Light of Daedalus Game Logo

Maze: Example Generated maze from [Leoche/Svg-Circular-Maze-Generator: Svg Circular Maze Generator \(github.com\)](https://github.com/Leoche/Svg-Circular-Maze-Generator)

Minotaur image by bapabst [Minotaur by bapabst on DeviantArt](#)

Story

During Ancient times it was believed that, even after their death, souls still carry the will and wisdom of their vessels.

You play a warrior from Athens during a siege by the Spartans.

Daedalus has been worshiped there for many years and one of his most important creations has been stored and kept safe.

Multiple attacks have been unleashed on the hometown, and its state has been weakened. Determined to defend his city, the player decided to embark on a journey to free Daedalus' soul and inherit its wisdom, to create weapons in order to ensure the survival of his people.

The player travels to the maze built by Daedalus on behalf of king Minos, equipped with the Light of Daedalus weapon. He ventures inside the depths of the maze, aiming to reach its core where Minotaur is trapped with the soul of Daedalus.

Design

World Design

The game is level-based.

As the story progresses inside a maze going from the surface level towards a core level, the whole world will be situated inside a dungeon.

The whole design and feel will also change progressively, the nearer we are to the surface the more ruined the architecture is, in opposition to the deeper we progress the more well preserved the rooms and architecture of the levels are.

As the game is inspired by Ancient Greek Mythology, the world includes Greek architectural elements used inside the dungeon.

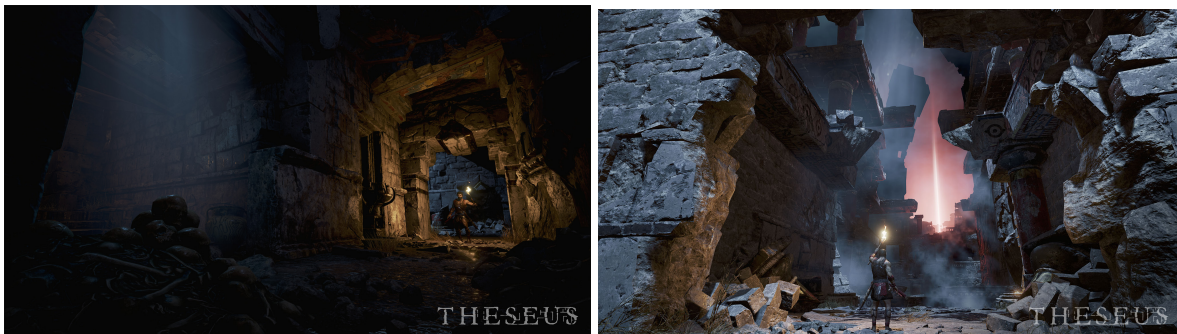


Image 1: Game World Design Inspiration
Theseus VR Game from <https://www.reply.com/reply-game-studios/en/theseus>

Equipment

The player will be equipped with the Light of Daedalus weapon, which consists of a central part which condensates the light and shoots a ray in the respective direction. Some levels will unlock new colors, which will be added to the color collection the player has on his weapon, and can therefore switch the color of the outgoing ray.



Image 2: Light of Daedalus weapon sketch by Tim Simecek



Image 3: Daedalus by Zajeczyca from DevianArt
[Daedalus by Zajeczyca on DeviantArt](#)

Level Design

Going from one Level to the next will increase the overall difficulty and introduce new aspects and features to the game mechanics.

But to avoid frustration and overwhelming the player, we will introduce our core mechanics, in an almost isolated fashion.

Each essential feature will be presented throughout two or more levels, an introductory simple level, where the new feature can be learned on its own, and knowledge reinforcement levels with harder puzzles, and a progressive combination of previously learned mechanics.

The puzzles, which need to be solved in each level are in the form of a target object that needs to be hit with a ray having a specific color, coming from a specific direction following a determined combination of reflections.

The puzzle is essentially composed of a combination of mirror-like objects and a goal target.

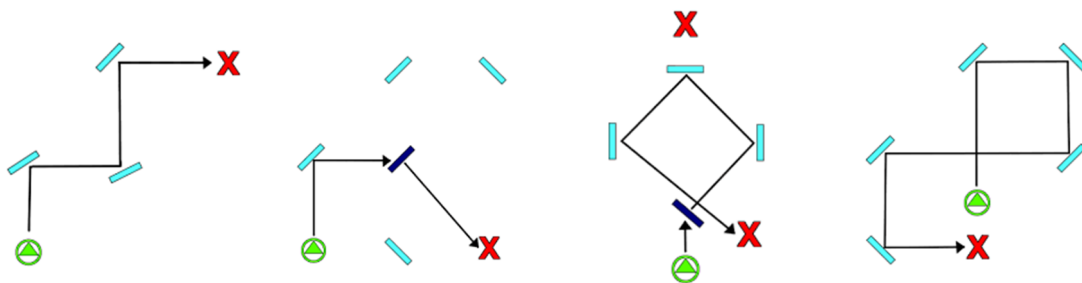


Image 4: Mirror-puzzle example Mechanisms

Puzzle solution from Genshin Impact, ice water puzzles: [Решение всех 11 головоломок Водное и Ледяное Зеркало в Genshin Impact 2.5\(portalvirtualreality.ru\)](https://portalvirtualreality.ru)

First Level Design:

This level is situated just beneath the surface and serves as an introduction level. Here the puzzle combination will be extremely easy, and the player will be introduced to our main feature, and core mechanic.

He will also learn about the color reflecting surfaces, which he needs to hit with the corresponding specified color and angle.

The player will have to adjust his shooting direction. With the presented freedom of moving the hand in the VR, although he is in a fixed position, the angle on the color-changing-reflective surface can be slightly varied and impact the outgoing ray. Lastly the player will also be able to distinguish the target goal that needs to be shot with the correct combination of the reflected ray with help of the obstacles.

After completing this Level, a new color will be unlocked and added to the set on his gun.

Second Level Design:

After introducing the core mechanics, the player will use this level to reinforce his gained knowledge and apply it to a more challenging puzzle combination.

In this level, the player will learn about the possibility to specify a color for the outgoing ray from his weapon, by choosing from a limited number of available, unlocked colors.

Third Level Design:

In this Level we will introduce another essential feature and it will not present a difficult puzzle.

The Player will learn about the ability to rotate the color-reflecting objects, with help of a handle to adjust the path of the reflected outgoing ray drastically.

The player will also learn about the breakable objects. With a simple combination of light reflection and color theory, he can break obstacles

Fourth Level Design:

Following the described pattern, this level is a pure reinforcement level with an increased difficulty of the puzzle.

Fifth Level Design:

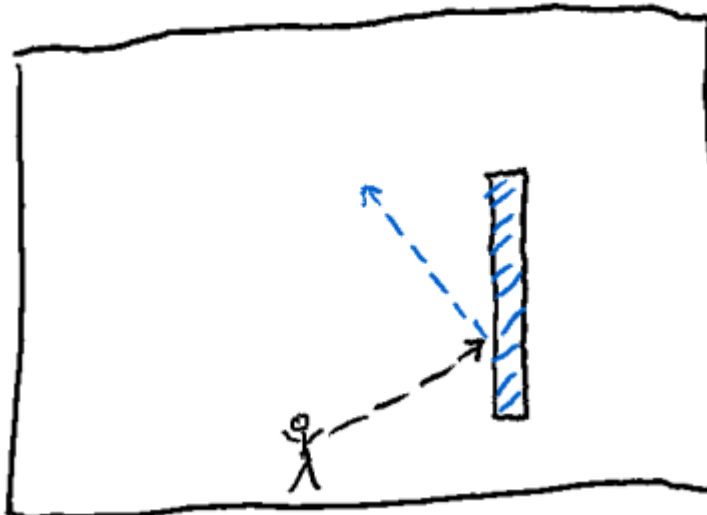
In this level, the player's spatial awareness will be tested, by introducing the cloaked objects.

As this is a new feature introduction level, the puzzle itself will be easy.

Obstacles

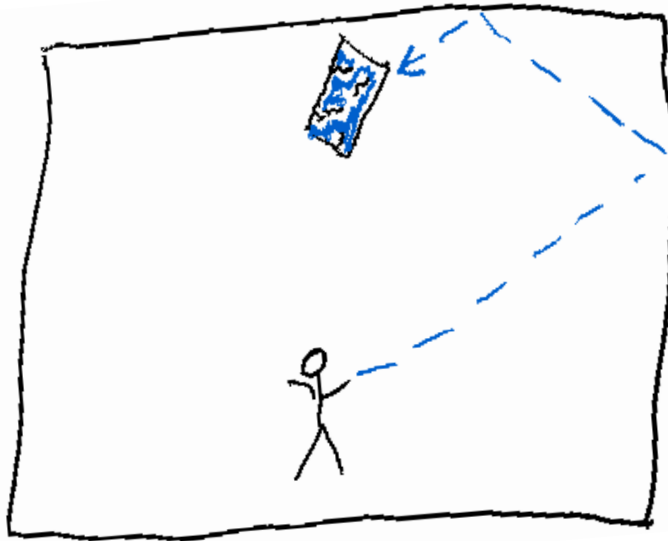
The objects listed below are components that might be added to the same obstacle in a room.

- Color reflective objects: These objects reflect the ray mirror-like, meaning that incoming angles are equal to outgoing angles. If this object has a specific color, it is added to the current ray color. They are not actual mirrors though and do not visually reflect the environment.



- Breakable objects: When these objects are hit with a ray of the correct color, they start to break until they are destroyed after a short time period. When hit

with the wrong color, the ray is absorbed.



- Cloaked objects: This type of object requires a lot of spatial understanding, as they can't be seen directly. The only way to see them is by looking through a mirror that is located in the scene. To increase their difficulty further, colored cloaked objects might only be visible through mirrors of the same color.



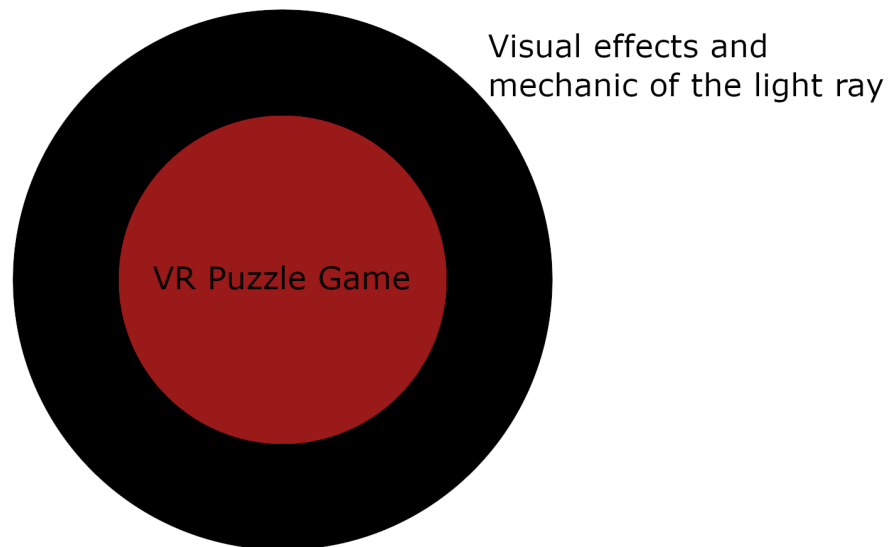
Technical Achievement

We will mainly focus on the visualization and presentation of the light ray that is emitted by the player. Therefore, visual effects are created that change at runtime depending on multiple variables.

First, the ray color influences these visual effects. The color changes after reflections or/and when the player changes the initial ray color that is emitted. The second aspect is the incoming/outgoing angle on reflective objects, which specifies the

accuracy of the visual effect, meaning that larger angles may look for instance more like a laser, while small angles add a little “gloom” around the real ray.
By these calculations we are not only getting great color dependent visual effects but also nice transitions between two effects.

Bullseye



The central conceptual idea is to create a VR puzzle game that focuses on light reflections and colors. It is incorporated by the mainly used Light of Daedalus device that facilitates the player to shoot a light ray, which uses visual effects that change depending on the ray color and emitted direction.

Goals

- Functional Minimum:
 - VR Setup
 - ray shooting and target mechanic
 - first level
- Low target:
 - ray reflections changing ray color
 - color change on light device
 - target allowing only specific color
 - breakable obstacles
 - ancient greek design
 - Main menu with basic tutorial
 - ambient music
- Desired target:
 - cloaked obstacles
 - interactables
 - light beam/breaking sound

- hard level with each obstacle
- 2 levels
- level transitions
- scene lighting
- High target:
 - story intro
 - story end
- Extra:
 - singularity/black hole obstacle
 - light magnifier
 - light splitter
 - story voicelines

Timeline

Tasks	25.04.	02.05.	Game Idea 09.05.	16.05.	Prototype 23.05.	30.05.	06.06.	Interim demo 13.06.	20.06.	Alpha release 27.06.	04.07.	Playtesting 11.07.	18.07.	Final release 25.07.
concept and mechanics brainstorming	all													
concept refinement		all												
reports		all		all			all		all		all		all	
VR setup					Tobias									
ray shooting					Tim									
target mechanic					Tobias									
ray visual effects					Tim									
ray reflection					Imène									
ray color change on reflectors					Imène									
ray color change on device					Tim									
target only allowing specific color						Tobias								
breakable obstacles							Tobias							
main menu level setup							Imène							
basic design setup								Tim						
ambient music								Tim						
asset creation			Tim, Imène, Tobias					Tim						
cloaked obstacles						Tim								
interactables					Tobias									
light beam/breaking sound								Tim						
level combining all obstacles								Imène						
design levels								Imène						
level transitions									Imène					
scene lighting								Imène, Tobias						
playtest										Tim, Imène, Tobias				
feedback implementation												Tim, Imène, Tobias		
story intro									Imène					
extras													Tim, Imène, Tobias	

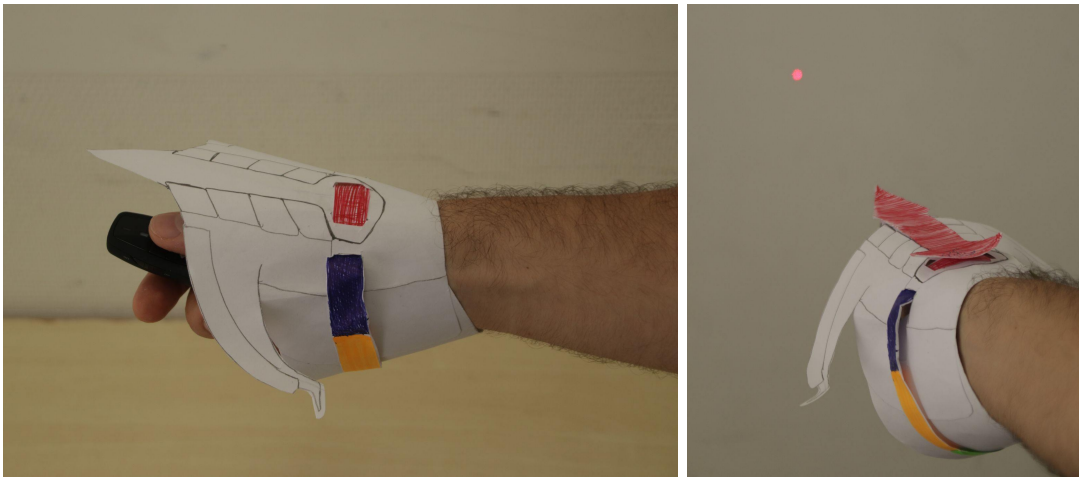
– Prototype –

Prototype Setup

In our prototyping process we decided to focus mainly on two parts: The actual VR first-person gameplay and the level design. It was necessary to be able to change the test scene quickly and modularly as it would be the case for the actual level design in the development process. Therefore, we created all physically representable gameplay mechanics by hand and attached them to furniture, to simulate a game level.

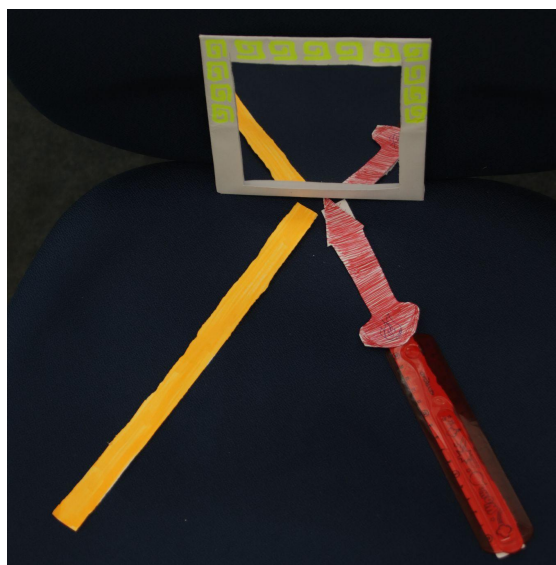
Light of Daedalus

Light shooting device with ability to change the ray color progressively. It consisted of a paper based adjustable model and a laser pointer imitating the light ray.



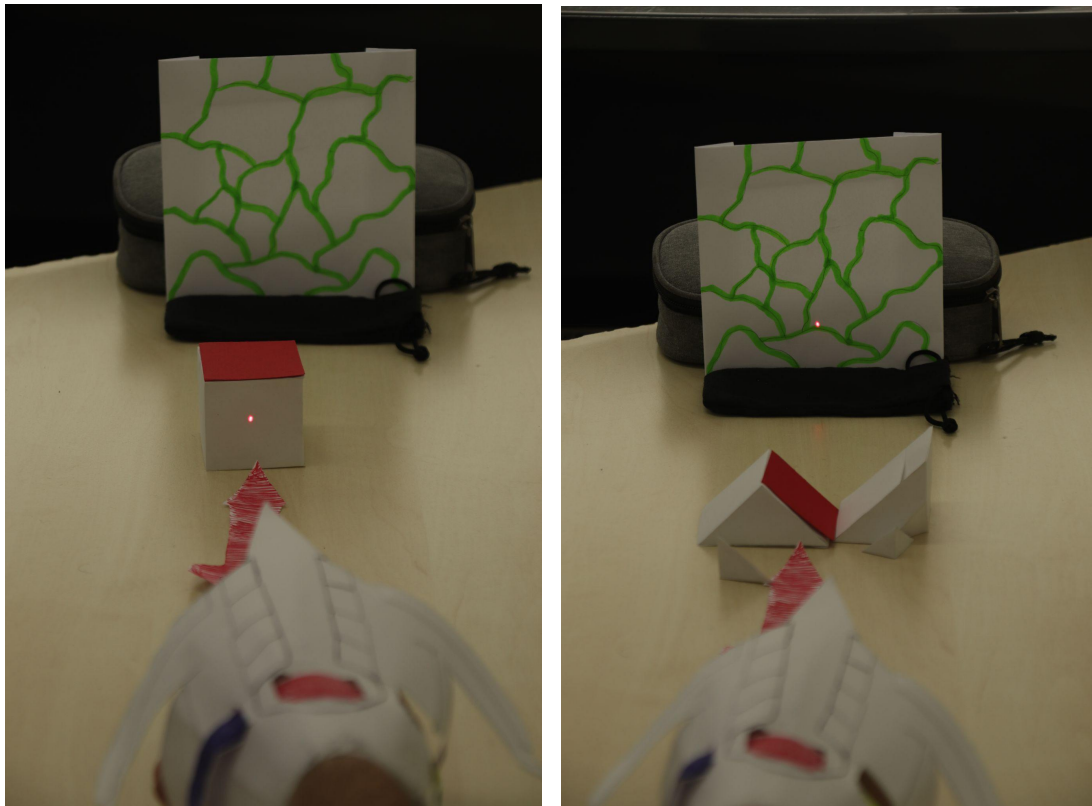
Color Reflective Objects

Reflects light ray mirror like, but is not an actual mirror in the game. Its physical representation uses a mirror to simulate reflections with the laser pointer and a paper frame showing its color.



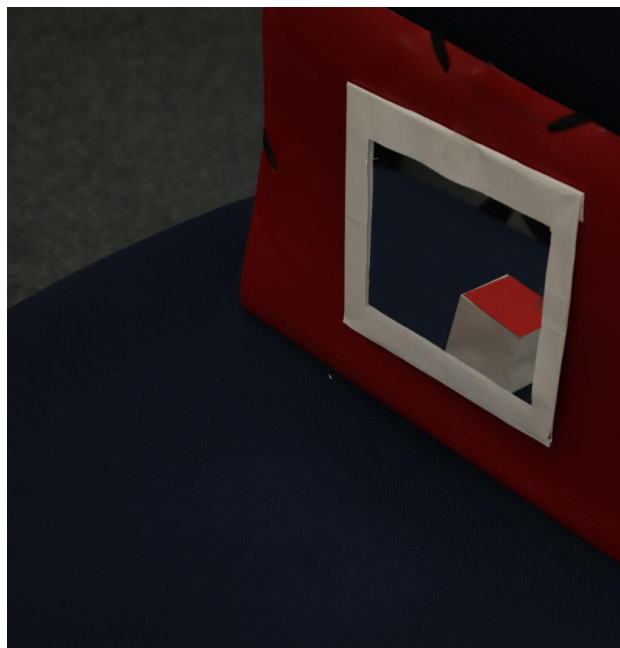
Breakable Objects

Burst when hit with the correctly colored light. Represented by a folded paper box (or folded pieces when destroyed).



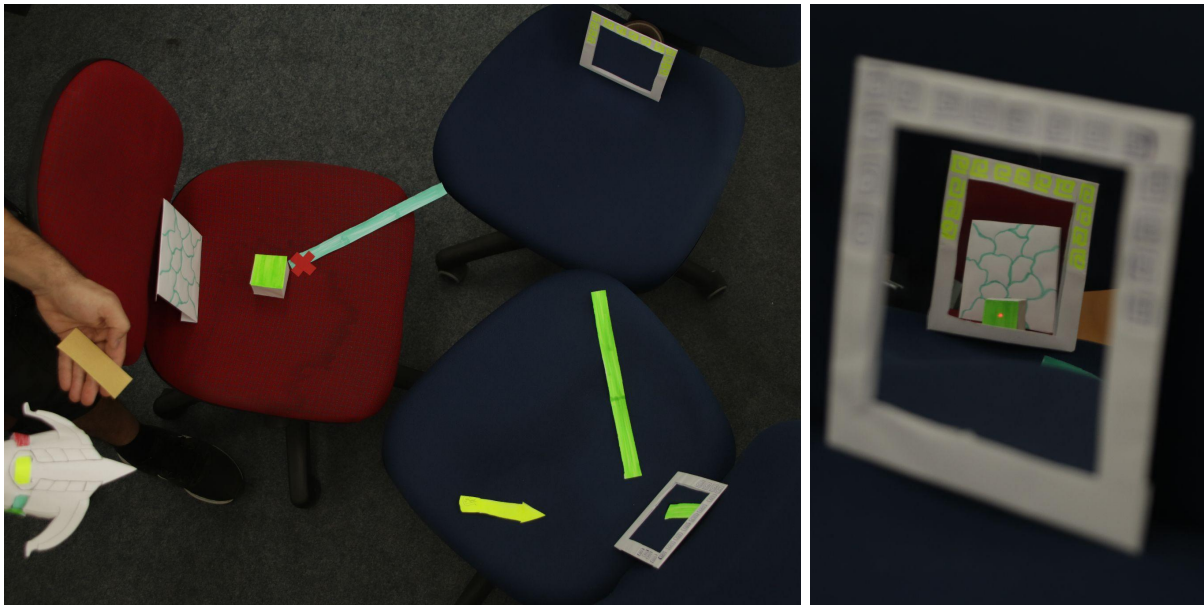
Cloaked Objects

These objects are only visible through actual mirrors, which don't reflect but rather absorb the light ray. These mirror objects have a designated frame color that will only display equally colored cloaked objects. Not possible to be recreated in the real world, so the images were edited to create the effect.



Level Setup

The level setup consists of the target, two reflective walls and a breakable obstacle. The picture to the right shows the point of view of the ray, but this is *not* how the player will see it. The colored paper strips represent the ray and the color changes it undergoes while being reflected by the individual reflective walls.



Playing Experience

Even though it was very nice to use reflections to hit a specific target, we faced multiple problems. First of all it was, specifically in the beginning, very hard to figure out where you are actually shooting as we always had to search for the laser point. This however shouldn't be such an issue when players are able to see the light path. Secondly, it was very demanding to use the mirror and even only get close to the desired target, which definitely came from object sizes on one hand and the player location on the other hand. However, after figuring out how to get closer to the target it got very exciting to use the reflections and think about required color changes. Furthermore, while changing the scene a feeling of excitement for playing emerged just by seeing the setup. But, this might have been a feeling emerging from a developer perspective, not from a player point of view although it also shows that the level design is deeply connected with the look.

Key features which we need to integrate are:

- light path and hit location have to be visible in some way to avoid frustration
- vastly increase obstacle size
- always consider changes to the player location

Design Revisions

Revisions from Prototyping

For level design evaluation we used a more abstract top down view of the scene and imitated approximate light reflections with the specific color changes. Hereby, we figured out that we have to be careful with the colors picked for the Light of Daedalus and the color reflective objects, as their combinations might lead to very similar results that couldn't be distinguished easily. Furthermore, the size of breakable objects needs to be larger than the actual target size as it might be easy to shoot around the breakable and immediately hit the goal. Especially in combination with rotatable reflective objects and other transformable objects. Positioning, size and respective color of objects have to be kept in mind.

Revisions from Comments

Level Difficulty and introduction to new mechanics:

Considering many comments, we decided to increase the number of levels to deliver. We also changed the number and order of introducing each feature. We decided to add each new mechanic in a somehow isolated fashion with a simple puzzle level, and then followed by a harder level that will combine the previously learned features with increased difficulty.

Ability to move the player and navigate the environment:

After a thorough discussion, we still decided to go with the original idea of not enabling free movement for the player. The most obvious reason is that adding movement may actually break the level design and even add frustration to the player.