Shadow Walker: The Umbra Project

TUM - COMPUTER GAMES LABORATORY SUMMER TERM 2018

Patrick Härtl, Julian Dräger and Jennifer Tipecska

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1. Game Proposal

1.1. Game Description

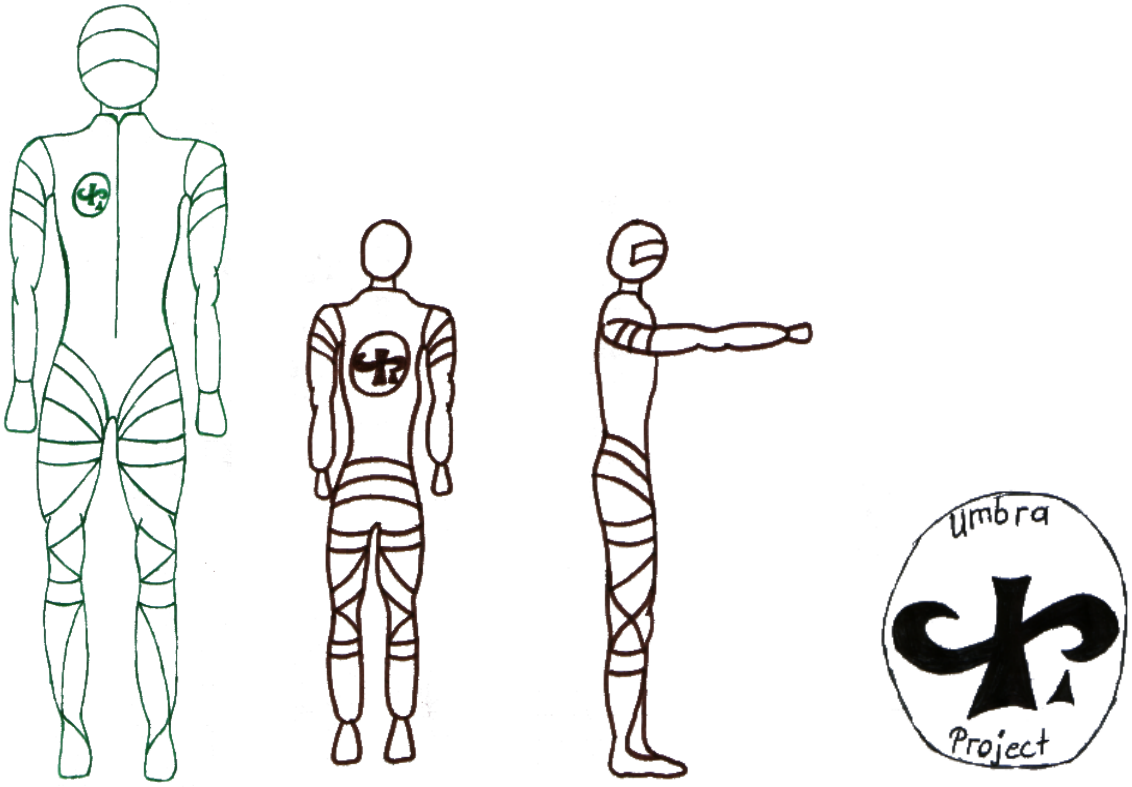
“Shadow Walker: The Umbra Project” is an angled side-scroller Puzzle Solve.To be able to solve each puzzle the player must switch between his character and its shadow. The character moves around and interacts in a 2.5D world with physical objects in his surroundings. In contrast to that, the shadow is able to walk along its 2D projected space (walls, mountains, trees) and carries on until either his path is blocked by another object’s shadow or his time is running out. Each puzzle will consist of different challenges only able to complete by controlling the character and its shadow. The game focuses on the contrast between the character being able to make changes to the physical world and the shadow being able to pass obstacles the character is not able to physically overcome. The main objective will be to challenge the player and his understanding on how light and shadows are correlated and thus affect each other.

a. Settings

While being on a mission to a secret test facility your spaceship gets caught in an unknown planets gravitational pull, unable to manoeuvre your ship out of the gravitational field your ship gets sucked into the planet’s stratosphere. You quickly notice that your sensors are going haywire and are not able to identify the planets chemical composition. Time is running out, you know if you do nothing your ship is going to crash, the sudden realisation hits you that you lost control over all the navigational systems. While passing through the planets inner atmosphere a loud sound pulls you out of your focus, an intense sound and a lot of flashing lights refocus your attention on your ships overall health report. You lost your engines! Now in freefall, knowing you cannot save your ship from a disastrous crash, you try to run into your life-capsule to ensure you survive the impact.
After all the turmoil outside the life-capsule has cleared, you decide to step outside to see how badly your ship is damaged. While walking through the main corridors, a lot less is damaged than you imagined, but by the time you reach the bridge and look outside the main window, you clearly notice the destruction. While your ship’s main body withstood the blast well, most of your engine and navigational systems are either severely damaged or lost parts on impact into the inner atmosphere.
In an impulse, you try to reach anyone in close enough proximity to aid you in salvaging your ship. But the same gravitational pull that caught your ship now hinders any communication out into space. You realise you are on your own!
Luckily your ships tracking system works and you are able to pinpoint the location of your ships missing pieces. While reading your instruments you notice something is “wrong” with this planet, in fear for your own safety you remember carrying the prototype spacesuit you were supposed to deliver to the test facility. Even though being completely in the dark about the special functionality this suit is supposed to carry, you decide better to wear it and be able to repair your ship, than to die and never find out how it works.

b. Mechanics

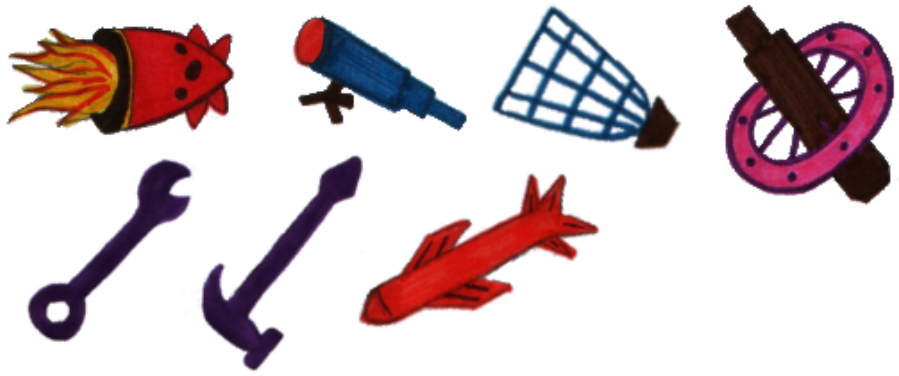
The first thing the character is noticing when disembarking his ships is that in comparison to earth and all planets he has been on before, the gravitational pull is significantly stronger, rendering him unable to jump or climb on any kind of objects in his physical form.
The characters space suit has a futuristic ability. Through some kind of molecular separation, the character is able to dissolve his physical body and transfer himself into his shadow.
Since this shadow is a specifically generated shadow that matches its wears body shape, it does not change shape for any kind of reason. Light only influences the shadow in where it is projected onto the 2D plan. Since this is a new and unstable ability it is crucial that the character does not stay in his character form for too long otherwise the suit will not be able to rematerialise him again and his physical form will die. This will lead to a game over for the player and a reset to the last save point.



Since the player is able to switch between his character and its shadow at almost any point in the game it is important that the shadows are always calculated in real-time according to the current lighting positions. The 3D object will be projected with shadow texture onto the 2D background according to the calculated shadow position, this ensures that the shadow character is able to collide with the shadow objects.

Furthermore, during the progression of the game the player needs to collect two different kinds of items:

- collectables to repair the spaceship
- Level items necessary to solve the levels specific puzzle (might trigger temporary special abilities)

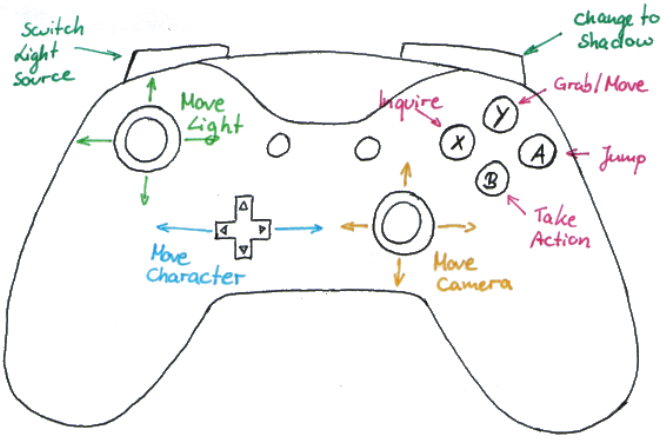


c. Artstyle

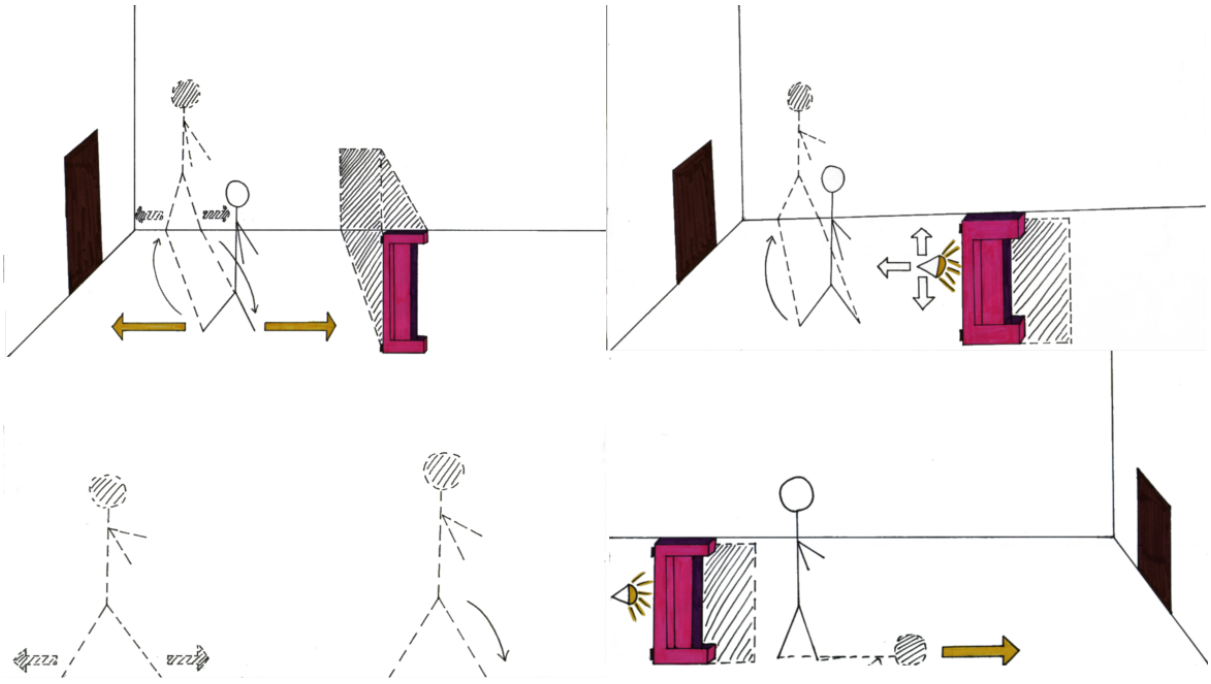
The primary world will have an environment consisting of low poly models. Those models will have a limited set of bright, primary and unshaded colours (colour blocking)
In comparison to that, the Shadow world will consist of black shadows as well as background textures depending on the projected surface.

d. Controls

Due to the possibility to move around different object (camera, player and lights) it is necessary to enable to player to control them in a more intuitive way than with a keyboard and mouse, thus we came up with a preliminary controller button mapping for our game.



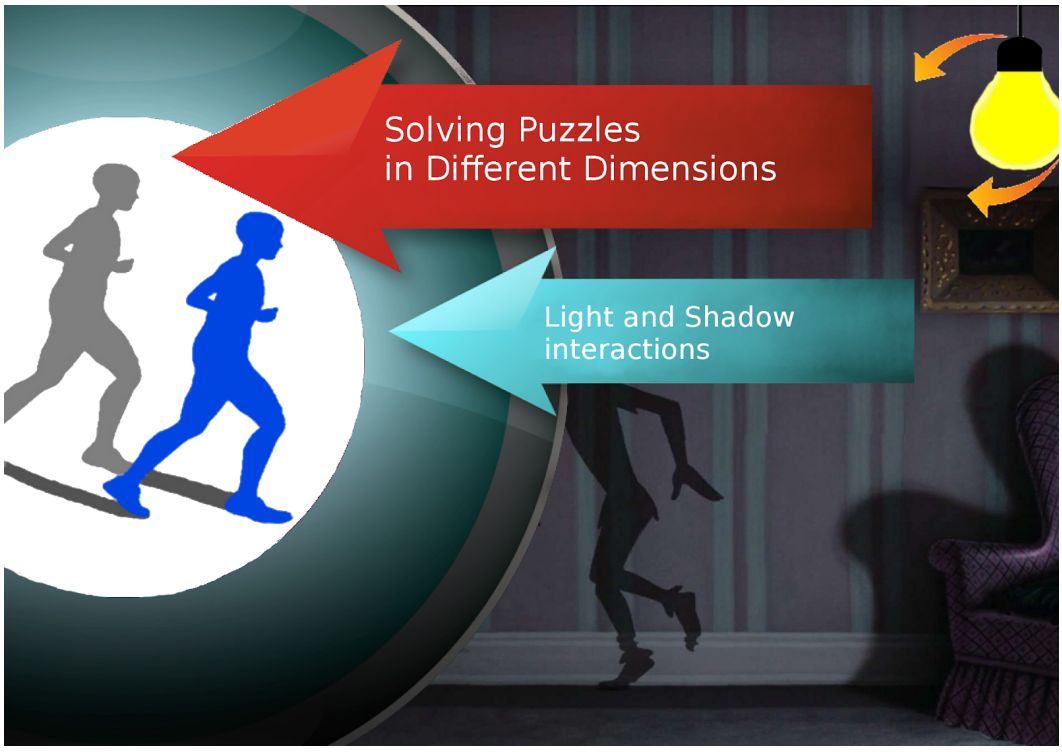
1.2. Gameplay Sketches



1.3. Technical Achievement

For the development of this game, we are going to use Unity. Unity is well suited since the basic functions for our game are already implemented.
However, the main features of our game are still to be developed.
The game unites many different technical achievements which we will implement in our game. In fact, the game is not only played in a 2.5D world which is the main world.
The player can switch to a 2D world which is made of the shadows of the objects in the 2,5D world.
Since the conversion of a shadow into a rigid gameobject is not implemented in Unity, we have to synchronize all objects in both worlds.
The shadows have their own colliders. This means the player can interact with them, e.g. jump on them.
Some objects can be dragged around in the 2.5D world to create new possibilities to progress through the game in the shadow world. If this happens, it is necessary to recalculate the shadow volumes which happens in real-time. This should allow for a smooth interaction between the character and the shadows.

1.4. Big Idea Bullseye



1.5. Development Schedule

Functional minimum:

- ➔ Shadow implementation with static lights
- ➔ A tutorial level which introduces controls and basic level and puzzle mechanics
- ➔ Controller mapping/controls
- ➔ Character modelling
- ➔ Environment modelling

Low target:

- ➔ Shadow implementation with dynamic lights
- ➔ Sounds
- ➔ Multiple Levels
- ➔ UI & Menu

Desirable target:

- ➔ In-level storytelling
- ➔ Player controlled lights
- ➔ License-free soundtrack

High target:

- ➔ Composed Soundtrack
- ➔ Cut-scenes
- ➔ More levels

Extras:

- ➔ Even more levels
- ➔ Longer story
- ➔ Puzzles with enemies

Task table:

Task	Description	Who	Hrs	Actual
1	Brainstorm game idea	All	5	
2	Game Proposal	All	3	
3	Presentation game proposal	All	2	
4	Wiki critiques	All	2	
5	Prototype	All	3	
6	Prototype report	All	4	
7	Prototype presentation	All	2	
8	Character modelling	Jenny	5	
9	Environment modelling	Jenny	6	
10	Dynamic shadow rendering	All	30	
11	UI, menu	Patrick	3	
12	Controller mapping/controls	Julian	10	
13	Level design: each	All	5	
14	Story	All	6	
15	Sound & Animation	Julian	10	
16	Cut-scenes	Patrick	15	

17	Interim report	All	6	
18	Interim presentation	All	4	
19	Alpha release report	All	4	
20	Alpha release presentation	All	4	
21	Creating Survey	All	3	
22	Play testing	All	15	
23	Play testing report	All	4	
24	Play testing presentation	All	2	
25	Bug fixing	All	20	
26	Release report	All	8	
27	Release presentation	All	4	
28	Video	All	3	
29	Demo day preparation	All	4	

1.6. Assessment

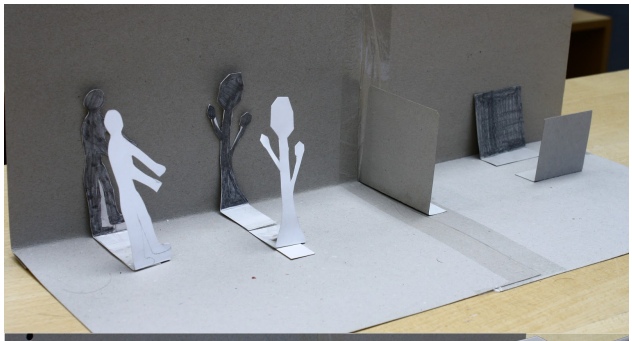
"Shadow Walker: The Umbra Project" foreshadows a bright variety of puzzles with varying difficulties.
This game is for everyone who likes to solve puzzles and is not afraid of a hurting brain.
We want to create a game in which the player has to consider different approaches and come up with a solution to various problems.
You will often use your amazing ability to switch to another world but sometimes there is more than one way to solve a puzzle.
The game takes place on a planet on which the astronaut crashed his vessel and lost all of its parts.
The simple art style guarantees an easy overview of the puzzles.
Hear the story of a little astronaut who finds out the truth about their shadow in a game full of puzzles and skill.

2. Prototype

2.1. Design

Since our game is a single-player puzzle game, our prototype features a simple example level to demonstrate the basic interactions between the overworld and the shadow plane. We created objects with their corresponding shadows for three different light directions (left, right, front). One player controls the character, whose shadow doesn't change, and the light. Depending on the light direction, one has to exchange the shadow objects. The player can also decide to switch to the shadow plane by removing the overworld objects so that only the shadow objects remain. While being in the shadow plane, one cannot change the direction of the light. Therefore, the player has to change to the overworld again to modify the shadows. In the prototype, our shadow plane is represented as a wall despite it being the floor in our game. We made this design decision since it's easier to present the game idea to an audience that way. Additionally, the camera in our game will be transformed while changing between planes. In-game the shadow plane will be in 2D and the overworld is displayed in 2.5D. We tried to show this mechanic with our prototype as well.

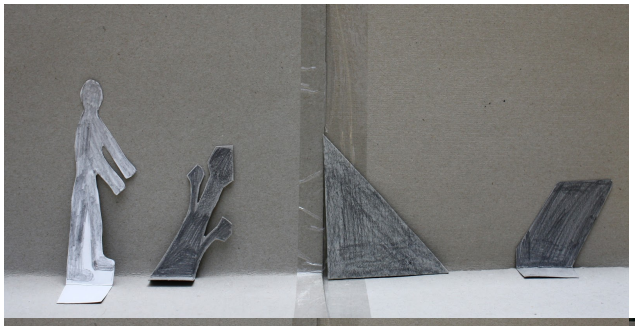
The following pictures show a way to solve our modelled prototype level:



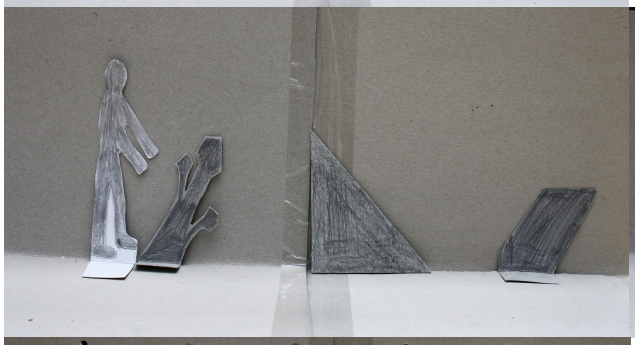
The starting positions of the objects and shadows with the light shining from the front. The player is on the left side. On his right are a tree, a wall and a crate

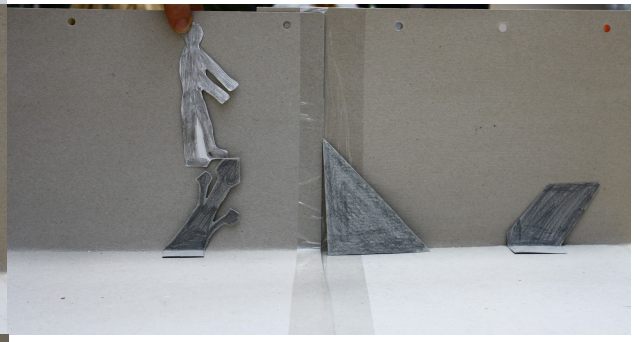
The starting positions of the objects and shadows with the light shining from the right.

The starting positions of the objects and shadows with the light shining from the left.

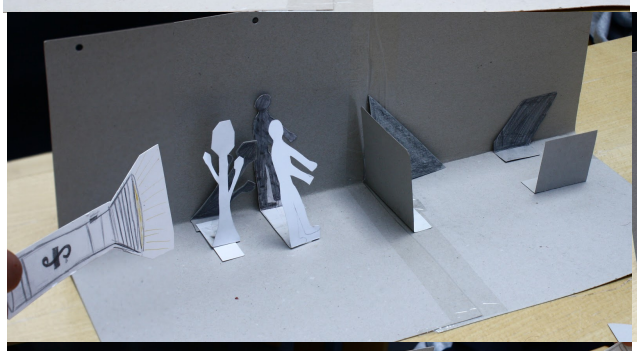


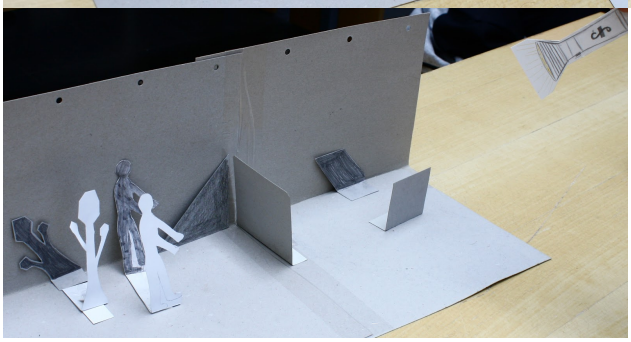
Now the player can change to the shadow plane and pass the tree:



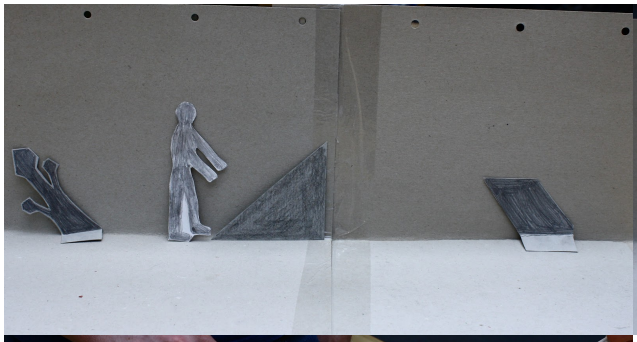


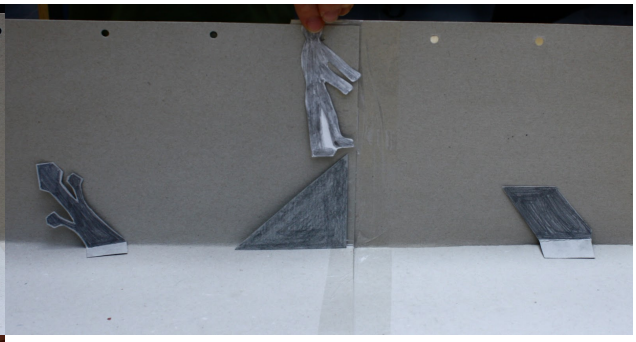
The player is stuck again and has to change back to the overworld:

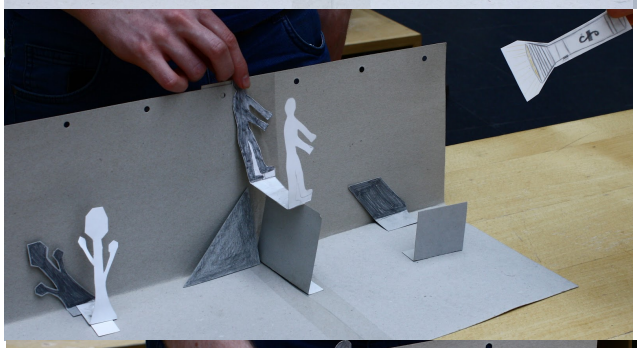




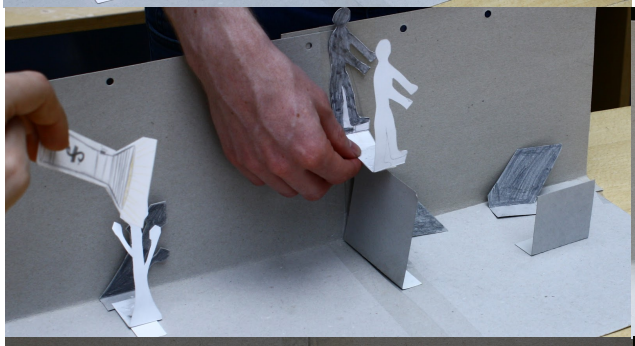
With positioning the light source to the right, he can get on top of the wall:

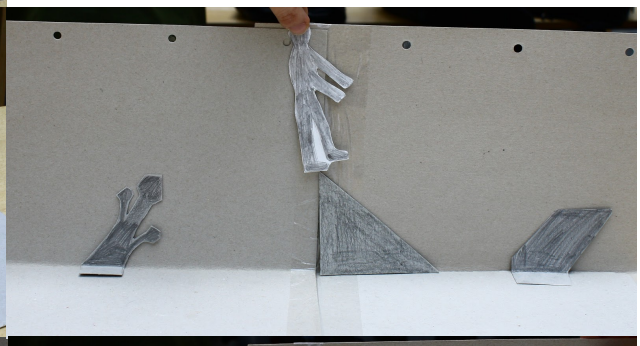


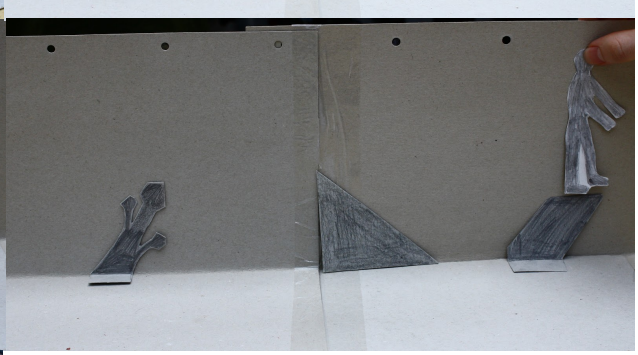


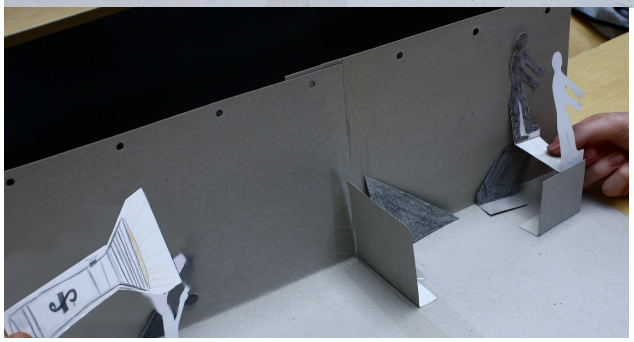


With changing the light position to the left he can now use the shadow to get down from the wall and onto the box:

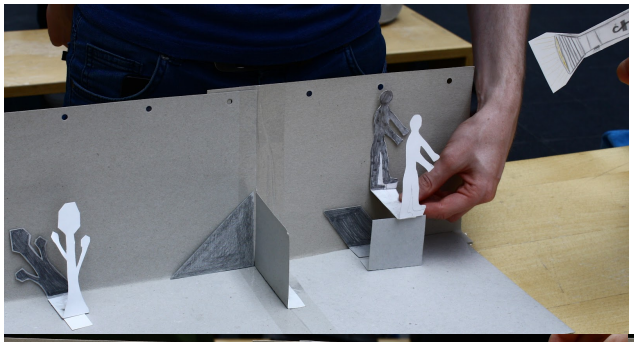




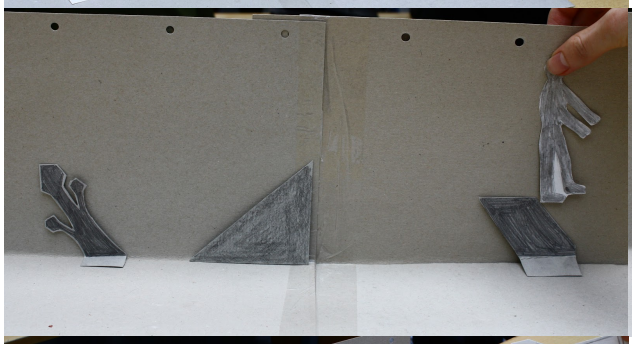


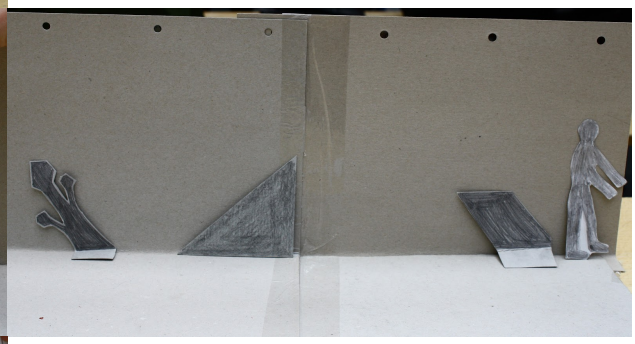


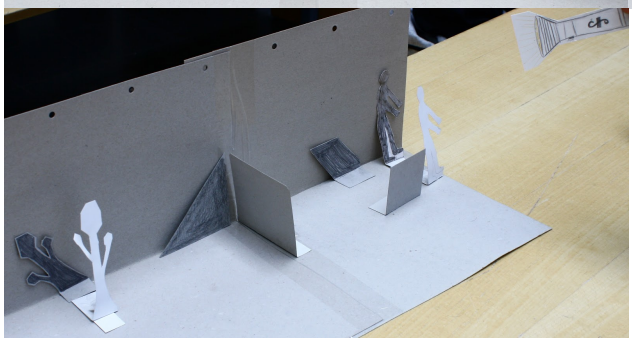
To get down from the box the player has to change the light direction again.



After changing to the shadow plane, the player will appear a bit above the shadow and fall down.







The player reached the end of the level.

2.2. Experience

When playing the game it was fun. Switching between the worlds played a very important role in our game. We had to regularly change between both worlds to progress. Therefore the game felt very dynamic as we don’t stay in one world for too long. In our prototype level finding the solution was not that hard as this will only be one of the introducing levels. We can imagine that creating more complex levels leads to more challenging puzzles.

2.3. Results

While creating the prototype, as well as different shadows for our “obstacles” we noticed that shadows are not naturally behaving the way we proposed in our pitch. If objects shadows are projected onto a background plane, their shadow does not change shape for any possible light position. These only occur if an object's shadow is directly projected onto the ground. Thus we decided not to use a 2D background where the shadow is projected, but to project all shadows to the ground and choose the ground level as our shadow world.

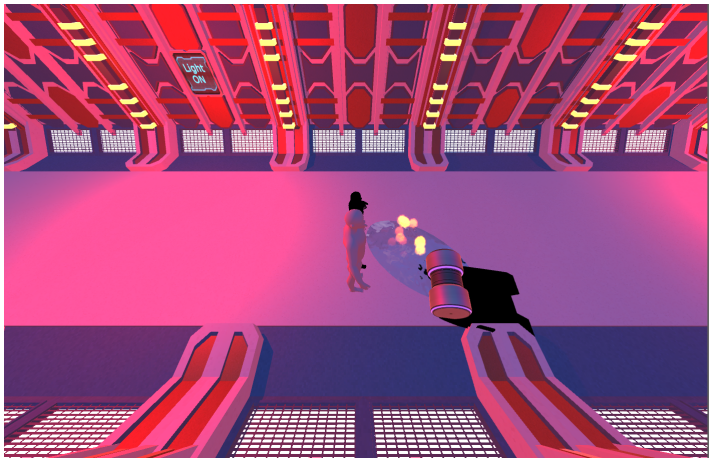
To make sure it is still possible to change attitudes in the physical world, we plan to establish a 0-altitude level whenever the player changes in the shadow world, corresponding to that if he goes upwards in the shadow world and changes back in the physical world he will be transitioned out in the same amount above the ground.

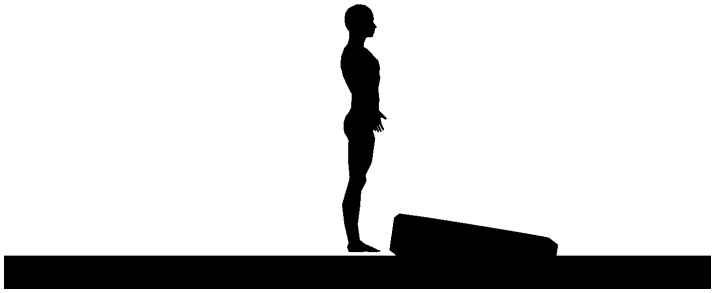
3. Interim Demo

3.1 Description of current state

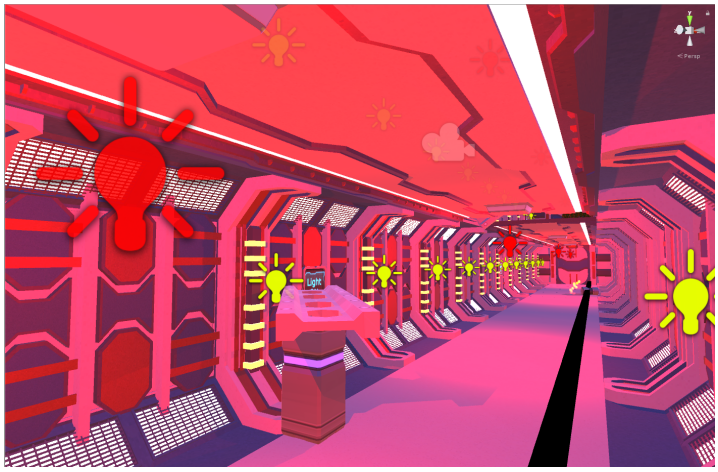
Functional minimum(Layer 1):

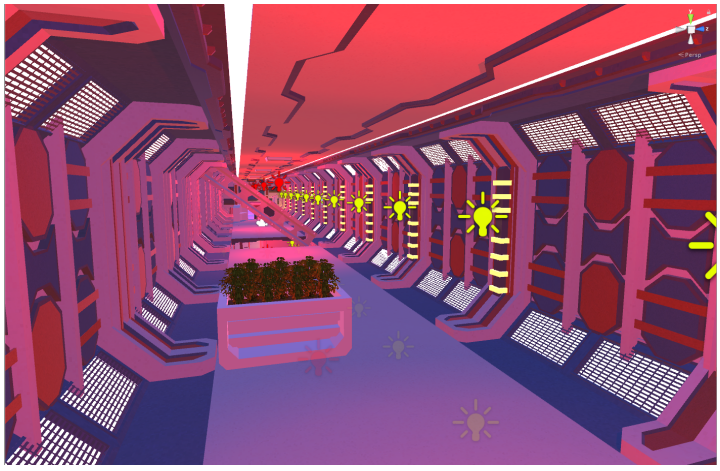
- ➔ *Shadow implementation with static lights*:
  Shadows casted from the brightest light on the shadow plane (floor). This light source has to be found from all lights in the scene. If the object is occluded by anything from the light or the light is too far away from the object, the light is not considered to be the shadow casting light for this object. The shadow mesh is calculated using the vertices of the mesh mesh of the shadowing object. This shadow is projected onto the next shadow plane. The point of the new vertex position is determined by the ray from the light source through the vertex onto the shadow plane. The shadow always has the same color and hardness.





- ➔ *Tutorial level which introduces controls and basic level and puzzle mechanics:*
  Tutorial Level and corresponding puzzles are completely setup, but only the lower level of the level is accessible in this demo version

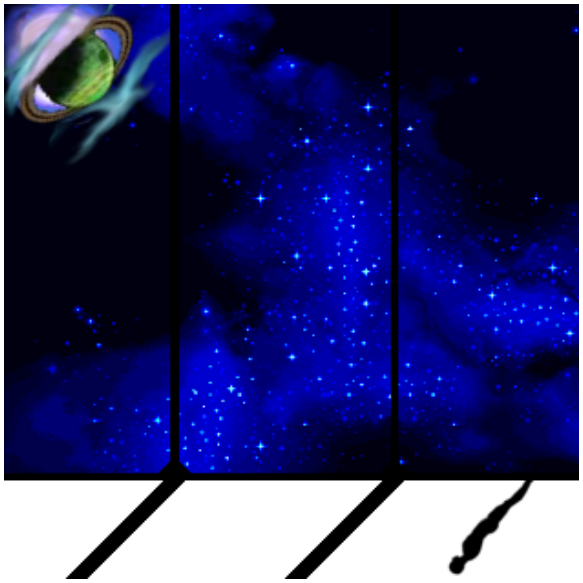




➔ *Controller mapping/controls:*
The game is controlled by a XBox Controller. The buttons are mapped as shown in the proposal. The world can be changed using the left bumper, while the light the player is currently controlling is changed by using the left bumper. The left analog stick is controlling the light and the right one the camera. The player can be moved using the gamepad. To inquire an object which displays a hint what this object does the player has to press the X button. The Y button lets the player grab something which he can then move around. Lastly, the B button lets the player interact with his environment for example to turn the lights on/off or open a door.

➔ *Character modelling:*
First Character Mockup of is done, as well as Rigging, Animating and Texturing will be done in the next phase

➔ *Environment modelling:*
The environment model of the first scene in the spaceship, as well as the transition into the next Forest Area is complete as well.



- *Transition between shadow world and real world:*
  The camera needs to be transformed from an diagonal perspective 2.5D view to and orthogonal top-down view. The color scheme also has to change to black and white while changing to the shadow world. The overlay for object outlines in the shadow world is currently in development.

Low target(Layer 2):

- *UI & Menu:*
  Menu and Sprite is done. In-game hints are included in the tutorial level.

- *Shadow implementation with dynamic lights:* This works similar to the implementation with the static lights. The main difference is that it has to be checked if the position of this object has changed.

- *Sounds*
  Music and FX sounds mostly done.

Desirable target (Layer 3):

- *Player controlled lights*: The player can control lights with controller. The area in which the light can be moved is displayed by a circle. This circle is always orthogonal to the scene. Moving the light changes the shadows of the objects it hits.

- *License-free soundtrack:*
  Done

3.2. Challenges and design revisions

The were no parts the we found significantly easier than expected, but there were quite a few parts harder than anticipated:

1. Merge Conflict, through need to work on similar things simultaneously, bringing all the parts together and ensuring they works together seamlessly and faultless.
2. Figuring out what additional components were necessary to realise what we envisioned but did not think about before, e.g. Camera/Character Interaction, which objects to display in which world, handling the merge of different shadow planes, ...
3. Figuring out which lights to pick the most efficient way was somehow difficult. The lambertian reflectance law was not sufficient as the intensity of light at the object was no given. Therefore we chose to use a distance based approach.
4. Creating meshes for shadows efficiently was quite hard. Unity does not have a possibility to get shadows directly from the scene as they would always change when the light changes. Figuring out how to calculate the mesh of a shadow by using the vertices eventually did the trick although we are using more vertices than needed.

We did not decide on any major design changes, there were just a few parts we did not think through until the very end; while implementing those and making the different parts communicate with each other, we noticed that sometimes we pictured detailed differently and needed to figure out which was the best or easiest way to solve out conflicts and realise our game mechanic.
In regard to that the environment/scene model changed iteratively many times to fit the underlying scripts and logic better.

4. Alpha Release

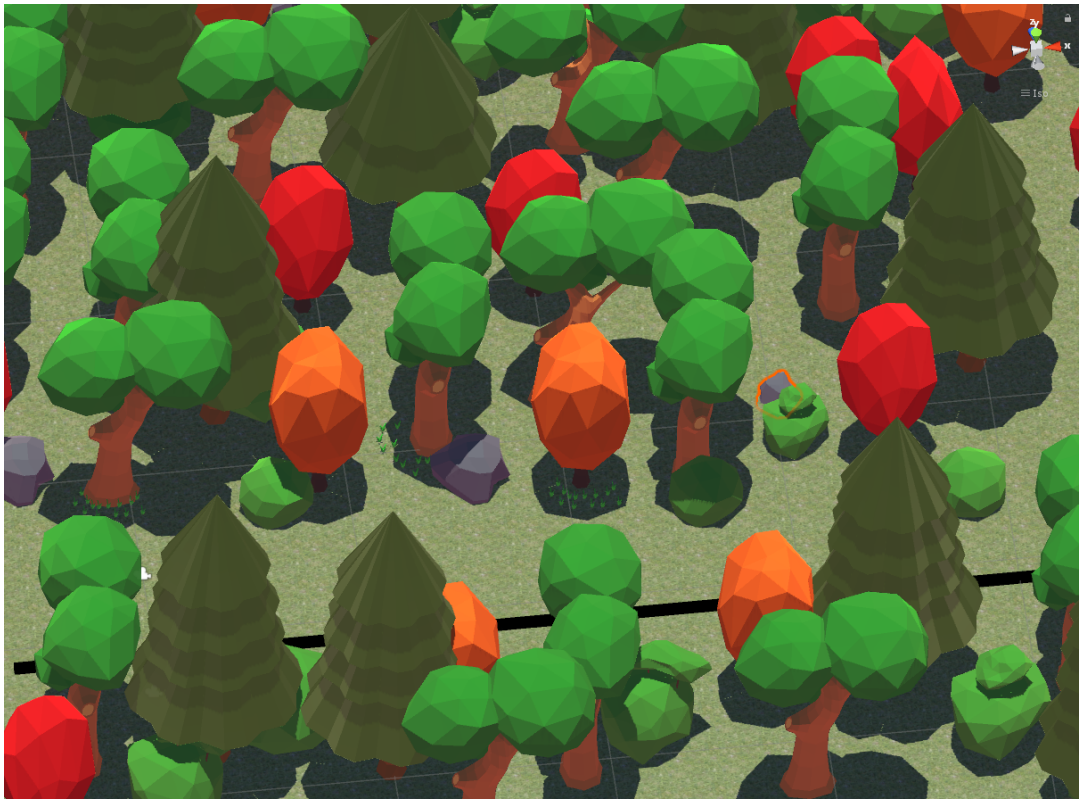
4.1. Description of current state

Functional minimum(Layer 1): => DONE

- ➔ *Tutorial level which introduces controls and basic level and puzzle mechanics:*
  Tutorial Level and corresponding puzzles are completely setup,both parts are now accessible through an elevator. Additional hints to make it unnecessary to introduce the controls are in place.

- ➔ *Character modelling:*
  Character is done; Rigging, Animating and Texturing were completed and included into the game

- ➔ *Environment modelling:*
  The environment model of the first scene in the spaceship, as well as the transition into the next Forest Area is complete as well. The environment model of the second outdoor scene was set up.



Low target(Layer 2): => DONE

- ➔ *UI & Menu:*
  Menu and Sprite is done. In-game hints are included in the tutorial level. Additionally it is now possible to select different levels in the Main Menu and save your progress.

- ➔ We tried another way to calculate the mesh of the shadow to handle the collision with the shadow character better. We wanted to gt exclusively the important parts of the mesh (an extruded outline). This method was too expensive, therefore we rejected it. We consider the shadow implementation as done.

- ➔ *Sounds*
  Music and FX sounds done.

- ➔ *Animations:*
  Character and Door animations are finished.

Desirable target (Layer 3): => DONE

- ➔ In-game storytelling: Done for the tutorial level

High target (Layer 4):

- ➔ *Composed Soundtrack:*
  We decided to focus on more important issues and not work on this at all.

- ➔ *Cut-scene:*
  Beginning scene introducing the story and setting of the game.

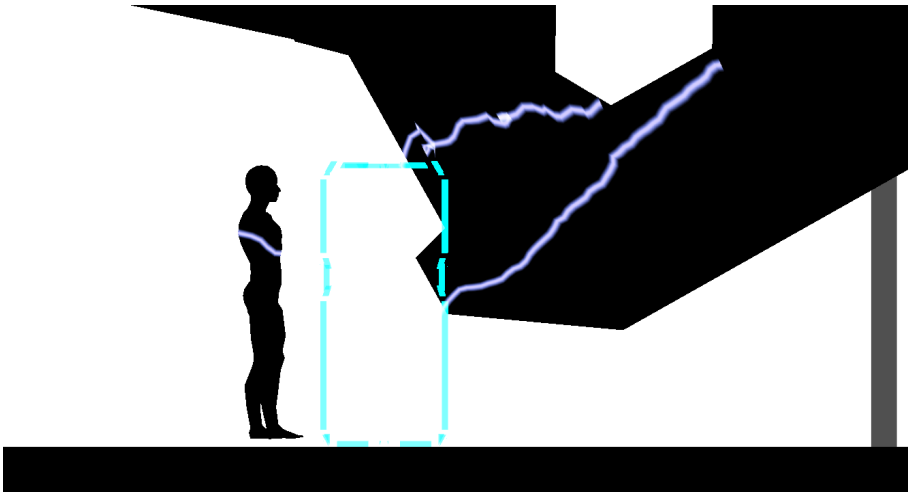
- ➔ *More levels:*
  The end goal is to have two complete levels

- ➔ *Shadow plane Transition (moving up-/ downwards):*
  The transition between the shadow planes is realized by a lift. This lift moves between two levels. The player can only use the lift in the real world.

- ➔ *Dying/ Timer Mechanic:*

A timer shows the remaining time left in the shadow world. If the time is up, the player will be forced into the real world. If the player can´t switch to the real world because of a blocking object, he will die and has to play the level again.

➔ *Outlines in shadow world:*
We created a shader which shows were objects are located in the real world and it is not possible to switch out of the shadow world. We are able to show outlines or normal rendered objects/effects from the real word in the shadow world.



4.2. Preparations for playtesting

A game is not just the interactions with the environment but the setting and its story as well. Thus, creating an immersive game where players can experience the situation better was a focus of creating the cutscene and in-game storytelling.

To ensure players testing our game have fun and are able to grasp the controls quickly we included quite a lot of hints showcasing the buttons and which interactions they trigger. Furthermore, we tried to create the interactions with the light sources easy and fun. While the puzzles in the first level are still pretty easy, we hoped to test our core mechanic in detail that's why showcasing the different kinds of possible interactions with the lights and the surrounding objects as diverse as possible.

Additionally, we started with creating the survey that should give us a better impression on how our game is perceived by others.

5. Playtesting

5.1. General Information

The playtesting sessions were done partially online and offline. We watched half of our testers physically and the other half virtually, while playing our game.
We explained that the game was created in an educational setting and that all his answers would only be saved anonymous and used to evaluate the current progress of our game. Most importantly, we ensured the testers that they could stop whenever they wanted to and would not be forced to play the game until it was finished.
Lastly, All our playtesters were given an introduction about what their job as a tester was (playing the game and giving as much detailed feedback as possible).

5.2. Questionnaire

1. **How often do you play games?**
   Mark only one oval.

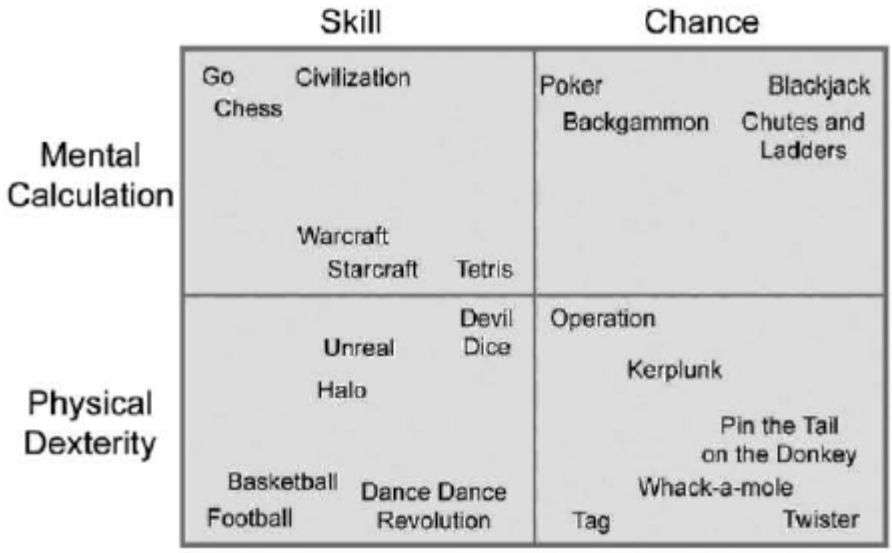
   - ◯ Almost Never
   - ◯ Monthly
   - ◯ Weekly
   - ◯ Daily

2. **What types of games du you usually play?**
   Tick all that apply.

   - ☐ Adventure
   - ☐ Platformer
   - ☐ RPG
   - ☐ Strategy
   - ☐ Shooter
   - ☐ Other

3. **How would you categorize the game as seen in the picture below. (Only tick one option)**
   Tick all that apply.

	100% Skill	70% Skill/ 30% Chance	50% Skill/ 50% Chance	30% Skill/ 70% Chance	100% Chance
100% Mental Calculation	☐	☐	☐	☐	☐
70% Mental Calculation/ 30% Physical Dexterity	☐	☐	☐	☐	☐
50% Mental Calculation/ 50% Physical Dexterity	☐	☐	☐	☐	☐
30% Mental Calculation/ 70% Physical Dexterity	☐	☐	☐	☐	☐
100% Physical Dexterity	☐	☐	☐	☐	☐



4. **What was your first impression of the game?**

5. **Was there anything you liked in particular?**

6. **Was there anypart of the game that frustrated you greatly?** *

7. **Did you enjoy the game?**
Mark only one oval.

	1	2	3	4	5	
Not at all	◯	◯	◯	◯	◯	Totally

2.

8. **Did you use a controller to play?**
Mark only one oval.

- ◯ Yes
- ◯ No

9. **What were problems you encountered with our control scheme?**

_____

_____

_____

_____

_____

10. **Was the game's goal clear to you?**
Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

11. **Did any parts of the game confuse you?**

_____

_____

_____

_____

_____

12. **How would you rate the difficulty level of the puzzles?**
Mark only one oval.

	1	2	3	4	5	
To Hard	◯	◯	◯	◯	◯	To Easy

13. **Are there any features you would like to see changed in the future?**

_____

_____

_____

_____

_____

14. **Additional Comments? Did you find any bugs or strange behaviour?**

_____

_____

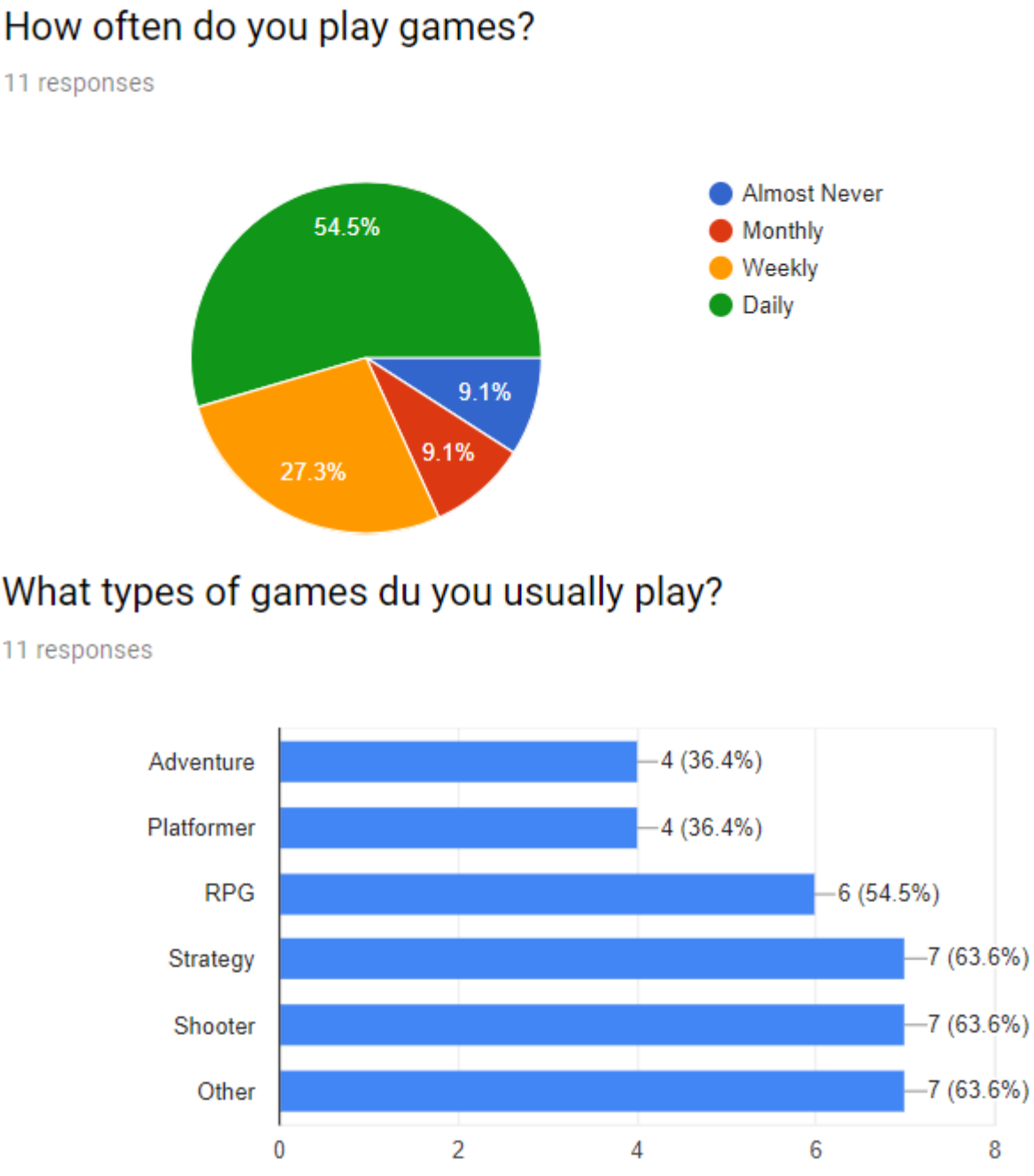
_____

_____

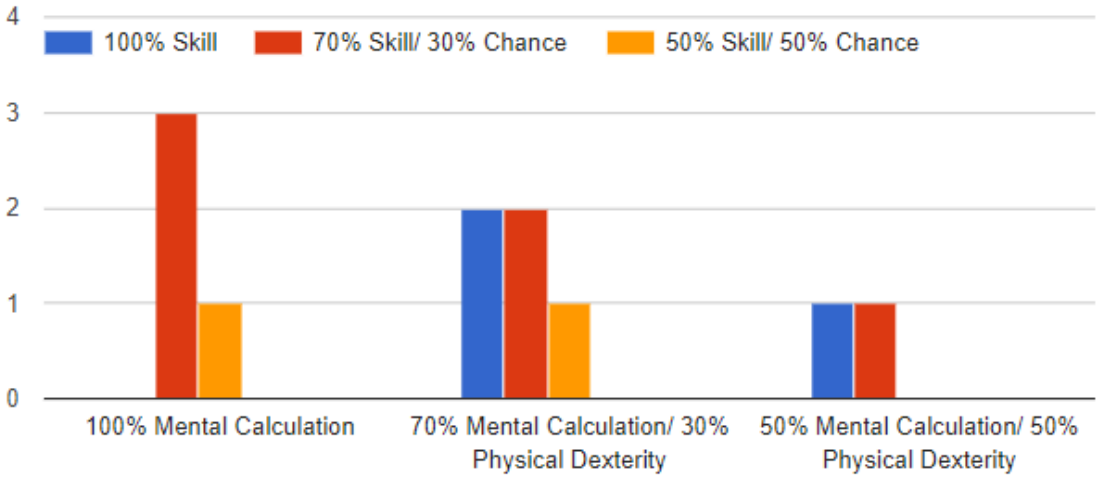
_____

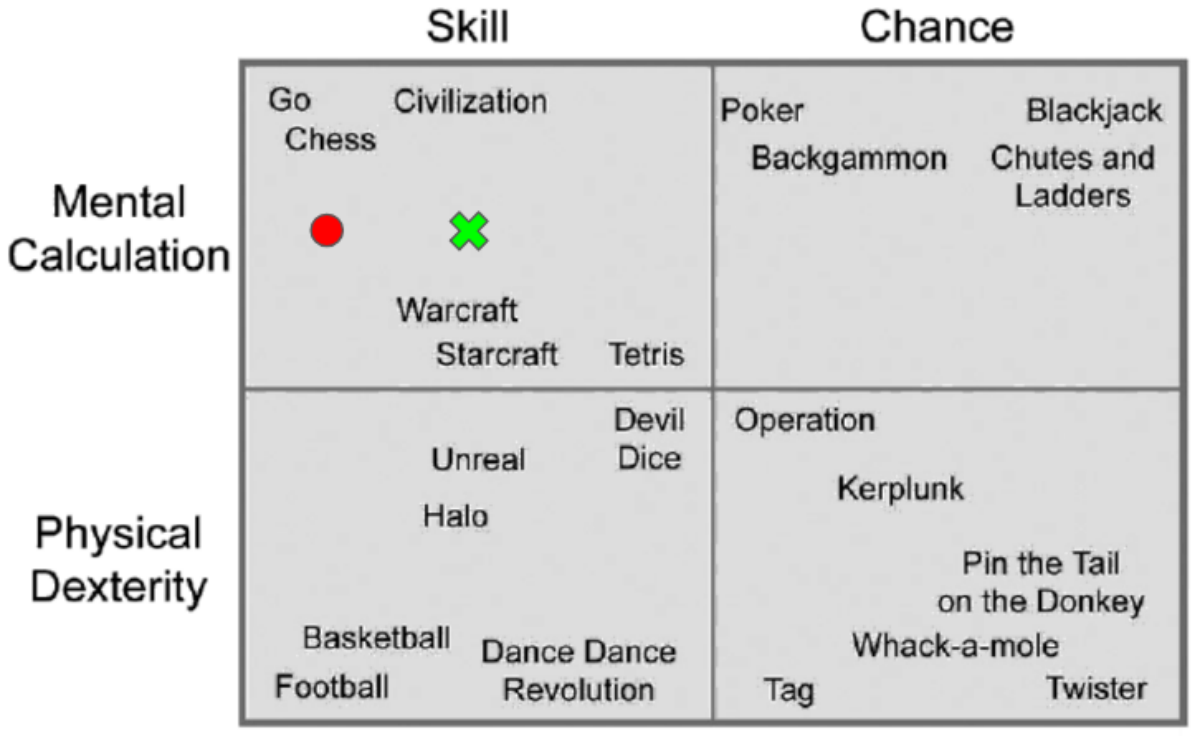
5.3. Generalised Feedback

Statistics



How would you categorize the game as seen in the picture below. (Only tick one option)





Red Dot: Our estimate
Green Cross: Ours testers estimate

What was your first impression of the game?

11 responses

What do i have to do?
Would play the finished game
Oldstyle :D
Nice music
Voll spacey
It had a very interesting setting.
The game looks simple,not difficult to start
slow (loading)
advanture game
- Realisation of a fancy and awesome idea (switching between worlds to advance in the game) - Not very polished (pixel ratio of the starting screen, key hints for controller only, etc.)
Im Startbildschirm/Menü machte mir das Hintergrundbild klar, dass man vermutlich als Schatten durch ein Level steuern kann, die Idee fand ich direkt gut und war gespannt, wie das dann ingame funktioniert. Die Musik war passend (und wurde auch nicht nervig). Ingame irritierten mich im ersten Moment die Beleuchtung meines Charakters (zu hell/platt im ersten Eindruck) und seine Position beim Spawn (zu weit rechts; in einem side-scroller erwarte ich weiter links zu sein um rechts mehr voraus sehen zu können). Als erstes habe ich versucht mit dem linken Stick zu steuern, was nicht ging, dadurch war die 'Verbindung' zu meinem Charakter im ersten Moment hakelig.

Was there anything you liked in particular?

11 responses

The bugs
Interesting concept
The Bugs
The music
Nice artstyle
The anmition at the beginning was cool. The music suited the game also very well.
the color of the background and the storyline
shadow puzzles
shadow realm
- The basic idea - The part where I had to move lights around manually to be able to overcome the obstacles - Switching to shadow mode and back felt pretty nice and seamless
Das Level ist hübsch. Mir gefällt, die Art der Mechaniken und dass man direkt und selbst losziehen kann und nicht endlos zugelabert wird. Speziell den Moment im oberen Deck wenn man aus der Schattenwelt zurück muss um über das Hindernis zu kommen fand ich an den Puzzeln gut, insgesamt gefällt mir das Konzept der Schattenwelt. Sehr sehr cool fand ich auch die Lichtquelle bewegen zu können, daraus könnte man vermutlich sehr viele und noch größere Rätsel machen. In 3D Manipulierbare Schatten und der Wechsel zwischen Räumlichkeit und 2D gefällt mir. Beim Wechsel zurück nach 3D so an neue Orte zu kommen, finde ich besonders befriedigend.

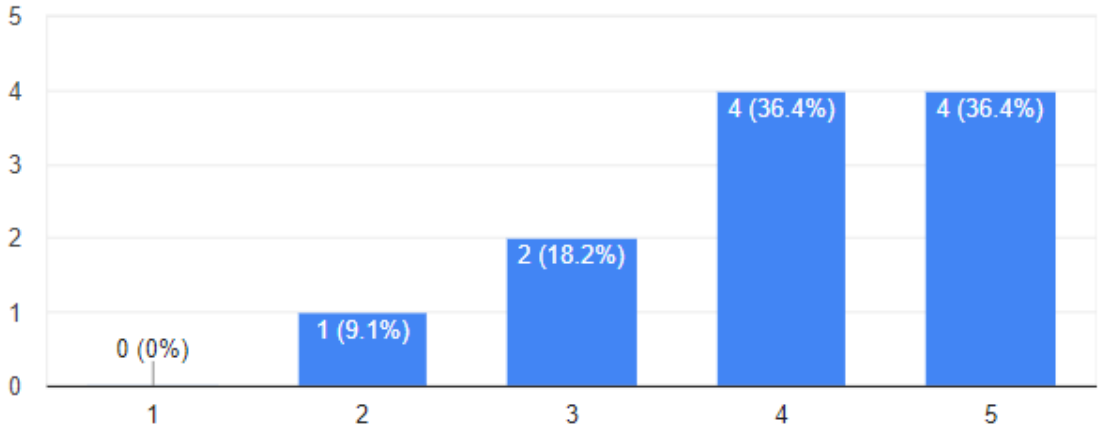
Was there anypart of the game that frustrated you greatly?

11 responses

input, goals
no
shadow Bugs
No running feature
Had to restart 3 times, because I couldn't progress further.
The orb was too small and melted a little bit into the background that it almost didn't catch my attention at all.
As a Player, it is not easy to know when to press the button for changing the light without instruction . And the following mission is unclear that the player needs to place the ball inside the generator to activate the elevator.
new start of the bugs
graphics/elevator
- When I went to the left side on the 2nd floor (before going to the right side) and solved the left puzzle but then got stuck between the last and next to last block without any options to get back out - so I had to restart the game
Nein, der Aufzug hatte einmal einen Bug, weshalb ich neustarten musste. Aber frustrierend fand ich nichts.

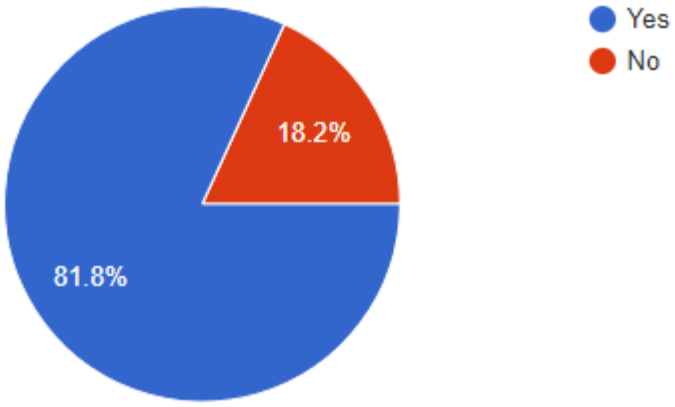
Did you enjoy the game?

11 responses



Did you use a controller to play?

11 responses



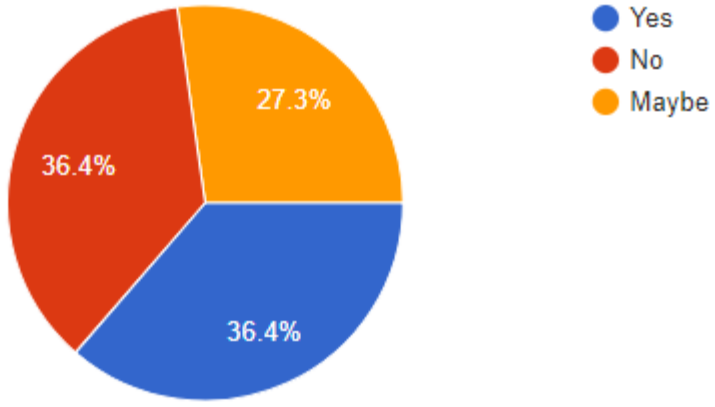
What were problems you encountered with our control scheme?

10 responses

Non XBox controller are not supported.....
Expected to control the game with the analog sticks, no instructions available in the menu
not allways able to get into shadow,
Movement is on the d-pad. No game ever does not use the left controller for character movement! Otherwise nice. A telegraph for knowing when an item in the background is interactable would be nice.
Movement with dpad. Last Puzzle: Control scheme not intuitive
The instruction for the buttons on the screen was not so clear and it took me a litter while to figuer out what they were.
Not every button will be used in the game
he walks always in the same speed, I can´t choosethe speed
none
Ich würde gerne den linken Stick fürs Laufen verwenden. Springen mit 'A' wäre cool, evtl die Lichtschalter und generell Schalter näher am Spieler positionieren.

Was the game's goal clear to you?

11 responses



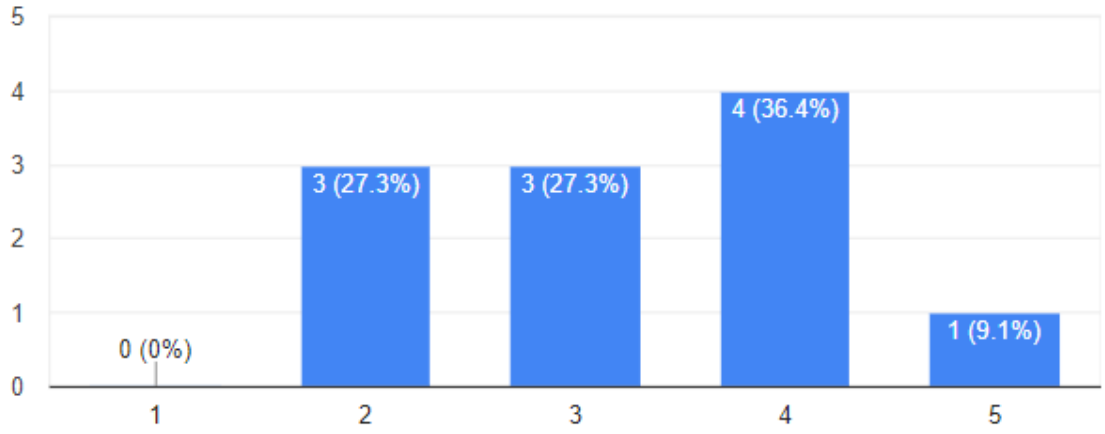
Did any parts of the game confuse you?

11 responses

Not sure weather confusing parts were bugs or game design
Pickups unclearly marked
the game physics :D
I died and did not lose my inventory.
Picked up the first orb without doing anything
The function of turning on and off the light was not instructed.
there is no map to tell player where to go
the goal, the missons are not clearly presented.
objective?
- I had forgotten the objective when I was at the right end of the 1st floor so it took me some time before I realised I had to go back to the levels beginning - At the end the game just quit instead of going back to the menu so I was confused if something had gone wrong
Die aktuelle Mission oben rechts anzuzeigen wäre vermute ich eine gute Idee. zB "Finde den Generator" und "Bringe den Generator in den Maschinenraum" oder "Finde die Schlüsselkarte" und zuletzt "Finde den Ausgang/Fliehe aus dem Raumschiff". Ich lese die Story oft un-gründlich, da hilft ein simples Missionsziel in 1-2 Worten.

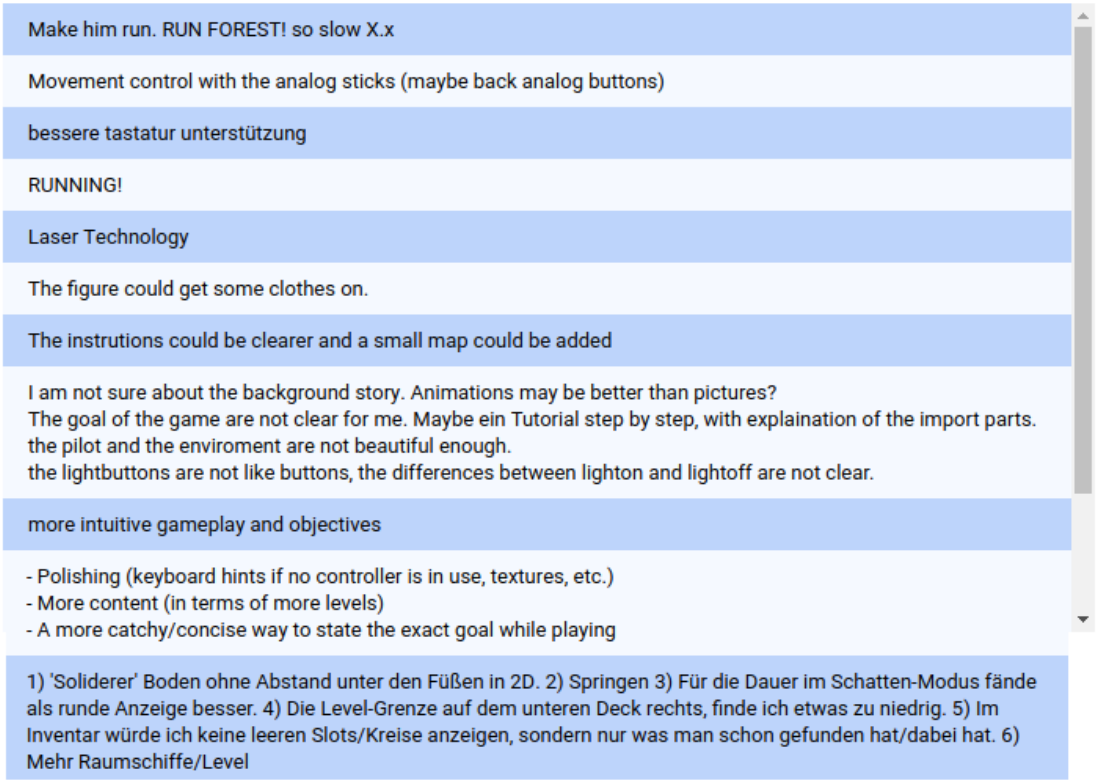
How would you rate the difficulty level of the puzzles?

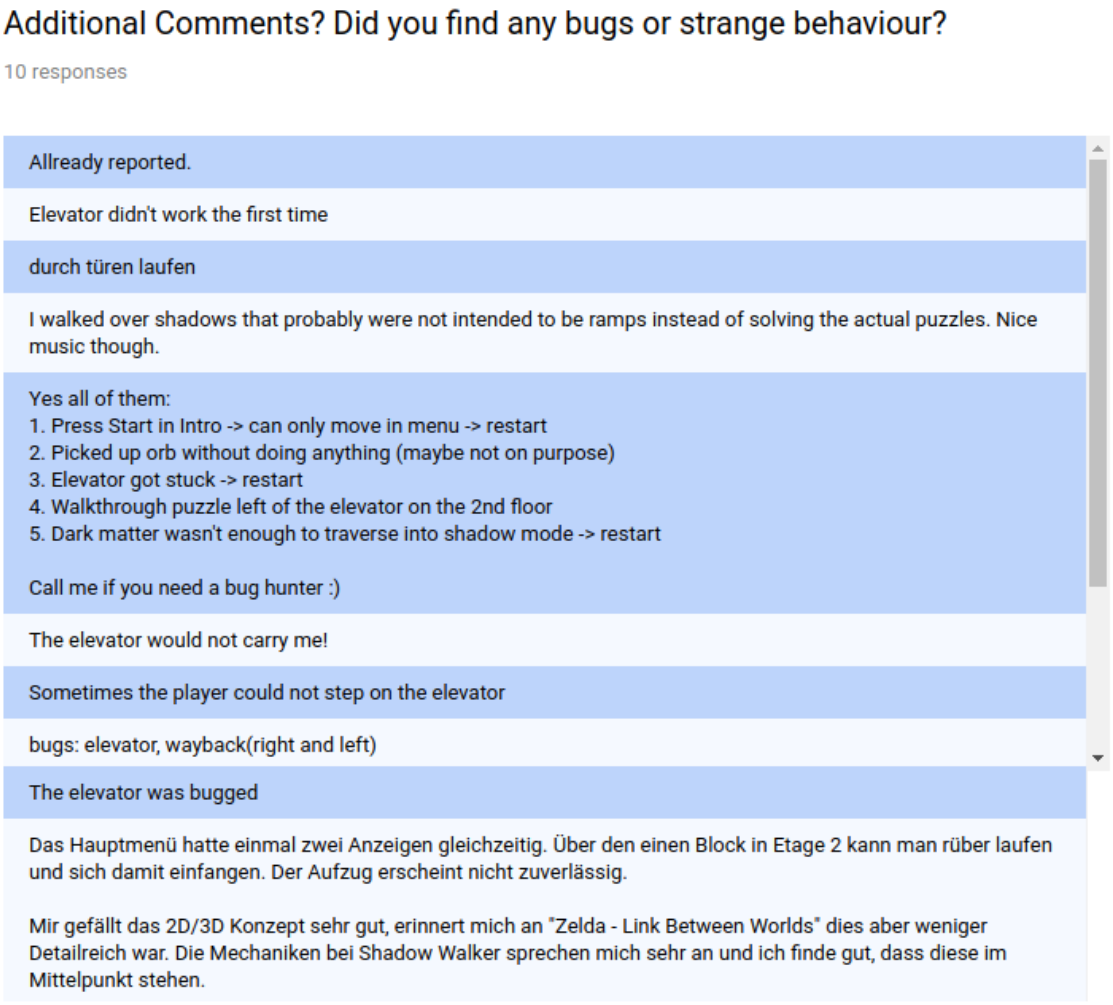
11 responses



Are there any features you would like to see changed in the future?

11 responses





Issues

- Goal/ Mission was unclear at some points
- The scene Loading between Scenes is to slow
- The Resolution of the Start Screen is to low
- Initial Spawn point needs to be more to the left
- Confusion with Joystick that controls the Character Movement
- Bugs in the shadow world
- Character Movement is too slow
- Collectibles not eye catching enough
- Hint that introduces basic interaction was not clear enough for light switch
- In Build: The Character is not able to stand on the elevator sometimes
- 2 Floor, left Puzzle: Possible to be stuck and need to restart
- Movable Lights control scheme not intuitive enough
- Changing from Shadow to Real world: If collectible is close automatic pickup
- Changes in Light switch not visible enough
- Shadow world: Character moves inches above the floor
- Able to walk through closed glass door
- Press Start in Intro -> can only move in menu -> restart

Suggestions

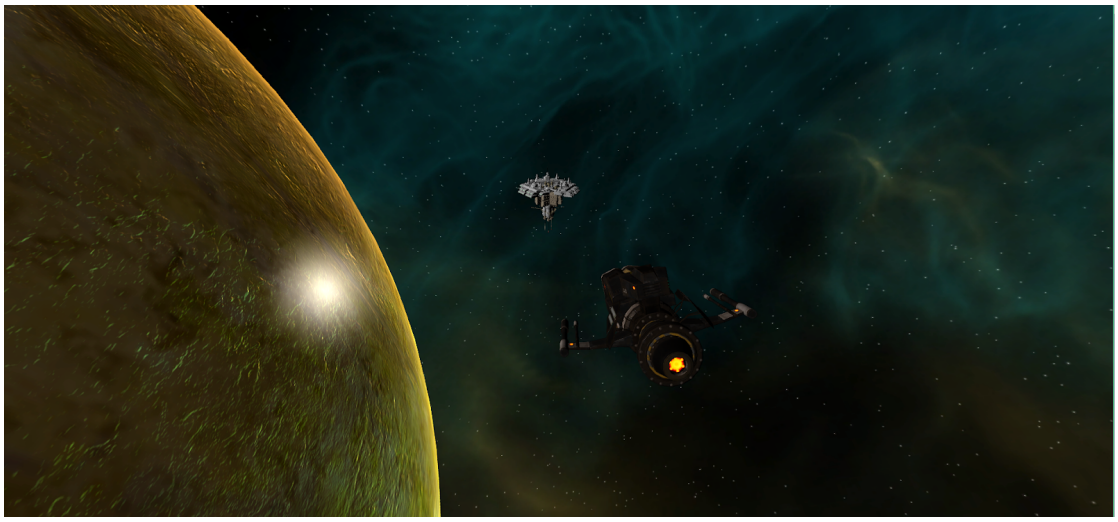
- Hints for Controller and Keyboard (Menu selection)
- Illumination Character less flat
- Support for other controllers
- Button Layout picture in Menu
- Better explain when shadow world is accessible and when not
- Different walking speed
- Use all mayor buttons (Additional interactions)
- Minimap
- End of game-> back to menu
- HUD current goal
- Round shadow world timer
- Only show outlines of collected items
- Create a second Level

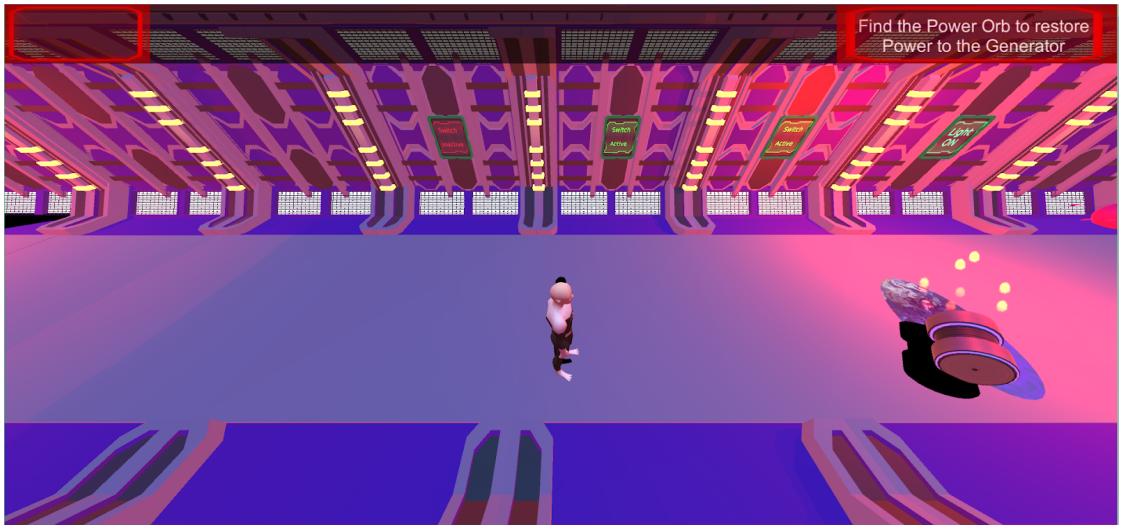
5.4. Changes to our Game

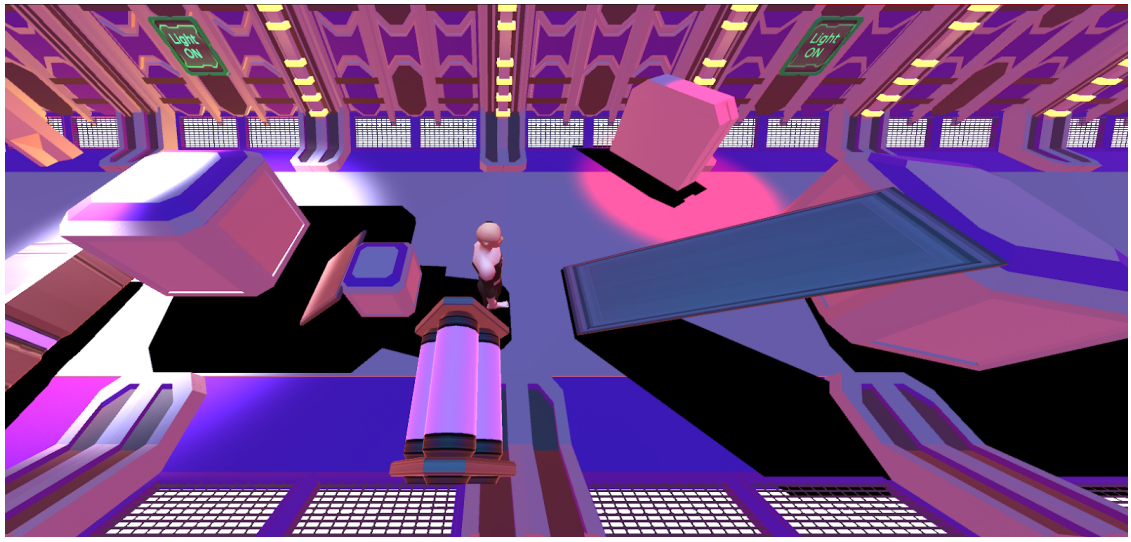
Firstly, we will focus on fixing all the bugs we currently have not yet. Additionally, we are trying to figure out why some of the bugs only occur in our build but never in editor mode. We already have started with this issue before we began playtesting, but unfortunately, we were not able to solve all of them and some of our testers experienced them (e.g. Elevator not carrying the character, able to walk through closed doors, etc).
Secondly, we will try to eliminate all points of confusion inside the game and make it more clear and understandable to minimise all the issues stated above.
Thirdly, we feel like most of the suggestions left by our testers would improve our game. Thus, we will prioritise the ones adding to gameplay and enjoyment if we are able to finish all of them swiftly we will also adopt the more cosmetic suggestions.

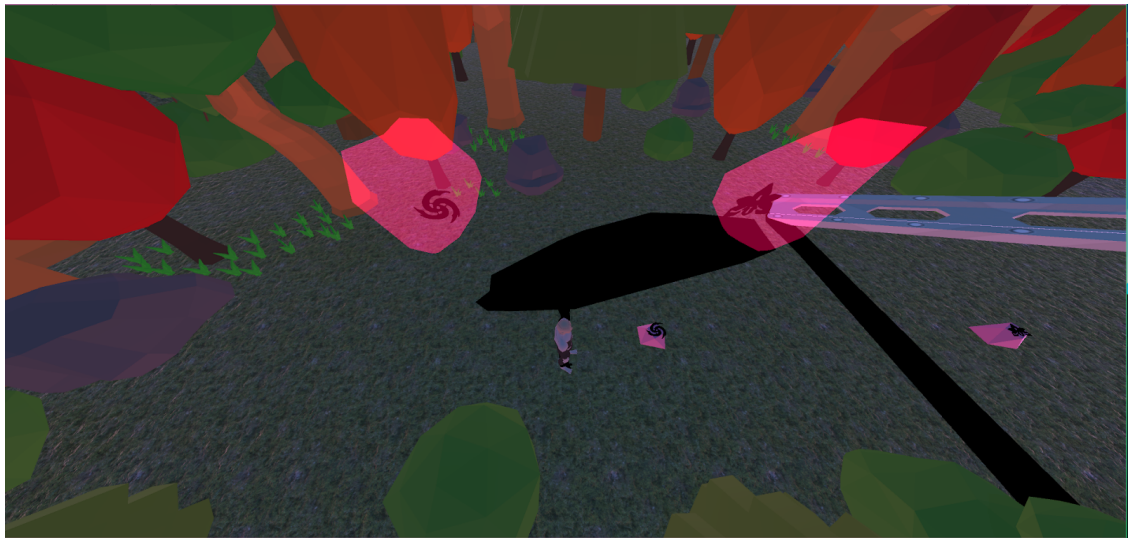
6. Final Release

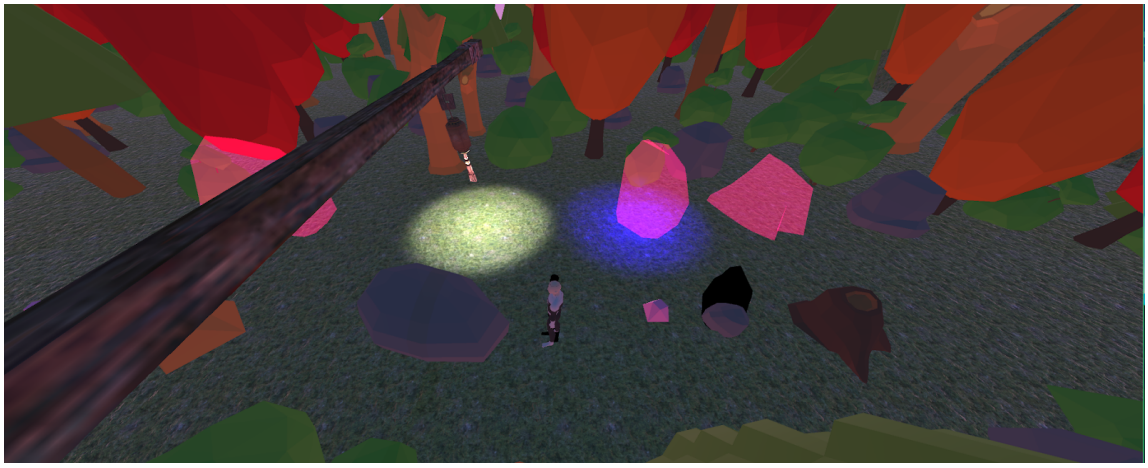
The final state of the game includes a second more complicated level, which gives players the possibility to challenge himself in solving our puzzles and adaptively using all the mechanics he learned in the introductory level.
Since the alpha release, our main change consisted of adding more content and making the game more intuitive for players. In the beginning, our game relied heavily on players reading the story carefully and figuring out themselves where to go next. Since this depicted as an entrance obstacle many did not feel comfortable with or forget the content of their mission as soon as they reached the first puzzle, we included a HUD overlay which displays the player's current goal.
Additionally, we fixed all the points our playtesters mentioned (summarised under 5.3. Issues) and implemented most of the suggestions we deemed significant given the short amount of time (summarised under 5.3 Suggestions).



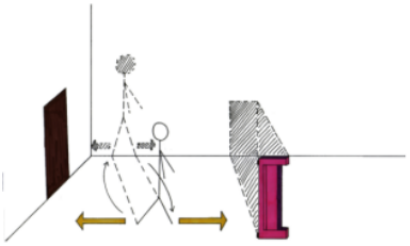


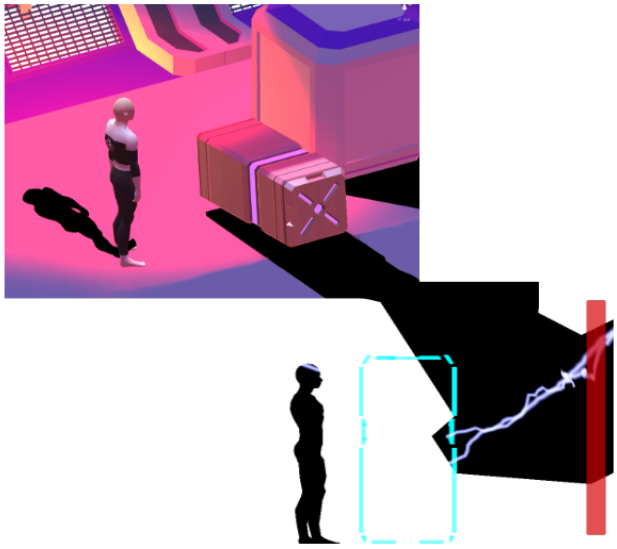

Light ON
Light ON

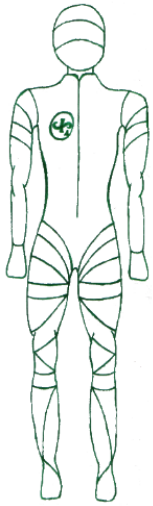


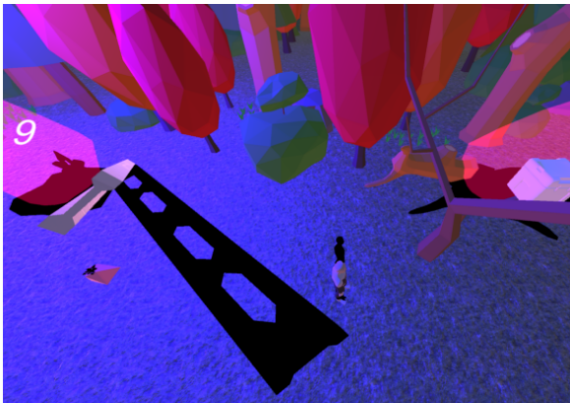


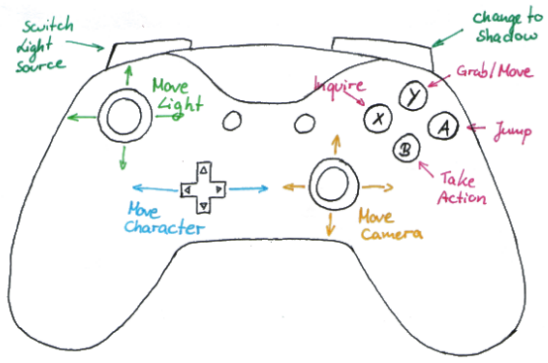
6.1. From an Idea to its Realisation











6.2. Updated Task Table

Task	Description	Who	Hrs	Actual
1	Brainstorm game idea	All	5	5
2	Game Proposal	All	3	5
3	Presentation game proposal	All	2	3
4	Wiki critiques	All	2	2
5	Prototype	All	3	5
6	Prototype report	All	4	4
7	Prototype presentation	All	2	3
8	Character modelling	Jenny	5	12
9	Environment modelling	Jenny	6	6

10/1	Dynamic shadow rendering	Julian, Patrick	30	50
10/2	Outline Shader	Patrick	0	6
10/3	Camera Transitions	Patrick	0	6
10/4	Shadow plane transitions	Julian	0	5
11/1	Menu	Patrick	1,5	6
11/2	UI	Jenny	1,5	4
12	Controller mapping/controls	Julian	10	3
13/1	Level design: each	Jenny	5	8
13/2	Puzzle Design	All	0	15
14	Story	Patrick	6	3
15/1	Sound	Patrick	5	4
15/2	Animation	Jenny	5	3
16	Cut-scenes	Patrick	15	5
17	Interim report	Jenny	6	5
18	Interim presentation	All	4	3
19	Alpha release report	Jenny	4	5
20	Alpha release presentation	All	4	3
21	Creating Survey	Julian	3	4
22	Play testing	Julian, Patrick	15	8
23	Play testing report	Jenny	4	4
24	Play testing presentation	All	2	3
25	Bug fixing	All	20	30
26	Release report	Jenny	8	6

27	Release presentation	All	4	3
28	Video	Patrick	3	3
29	Demo day preparation	Jenny	4	3

6.3. Evaluation and Impressions of the course (Jenny)

The project structure seemed like a waste of time in the beginning since in development the focus of the project main change slightly and other tasks might be included, but the further we progressed through the semester the more useful it seemed to become. It provided us with a read thread necessary to follow to be able to complete all necessary features by certain deadlines and have a concrete overview of the progress we have made.
In general, we did not deviate largely from our first schedule. There were a few tasks we did complete later than anticipated, but there were also things we included a lot earlier since they fit better in our development progress at that time.
I had a quite similar feeling about the prototype at first, it seemed like we could spend our time better by getting started on our project. Thankfully we invested the time in trying to make our idea work in the prototype, hence a lot of flaws in our idea became quite clear even before starting to code.
In contrast to that, I never doubted the usefulness of playtesting his own game always seems logic and easy for oneself, having concrete feedback on what issues users experienced was quite enlightening.

- What was the biggest technical difficulty during the project?

The greatest difficulties we faced were the implementation of our shadow core mechanic and the creation of challenging, yet fun puzzles.

- What was your impression of working with the theme?

I actually like the Idea of having a theme for the course, but I would have been more happy with a more concrete topic/ theme. While I know the main point of having something vague is to let our creative journey, for such a short amount of time having a clearer topic and understanding of what the course is expecting from you would be nice.

- What would you do differently in your next game project?

For the next Project, I definitely know to stay away from Puzzle games. These kinds of games demand a lot more creativity and design from you than games where the mechanic is more logically structured and logic and implementation is more necessary.

- Are you happy with the final result of your project?

I am definitely happy we managed to somehow get two different levels done and create more challenging puzzles. But I feel like we could have done so much more if we did not “waste” so much time on design and gameplay. Ultimately, most of those tasks were mine and I did not have a lot of experience in this department beforehand.

- Do you consider the project a success?

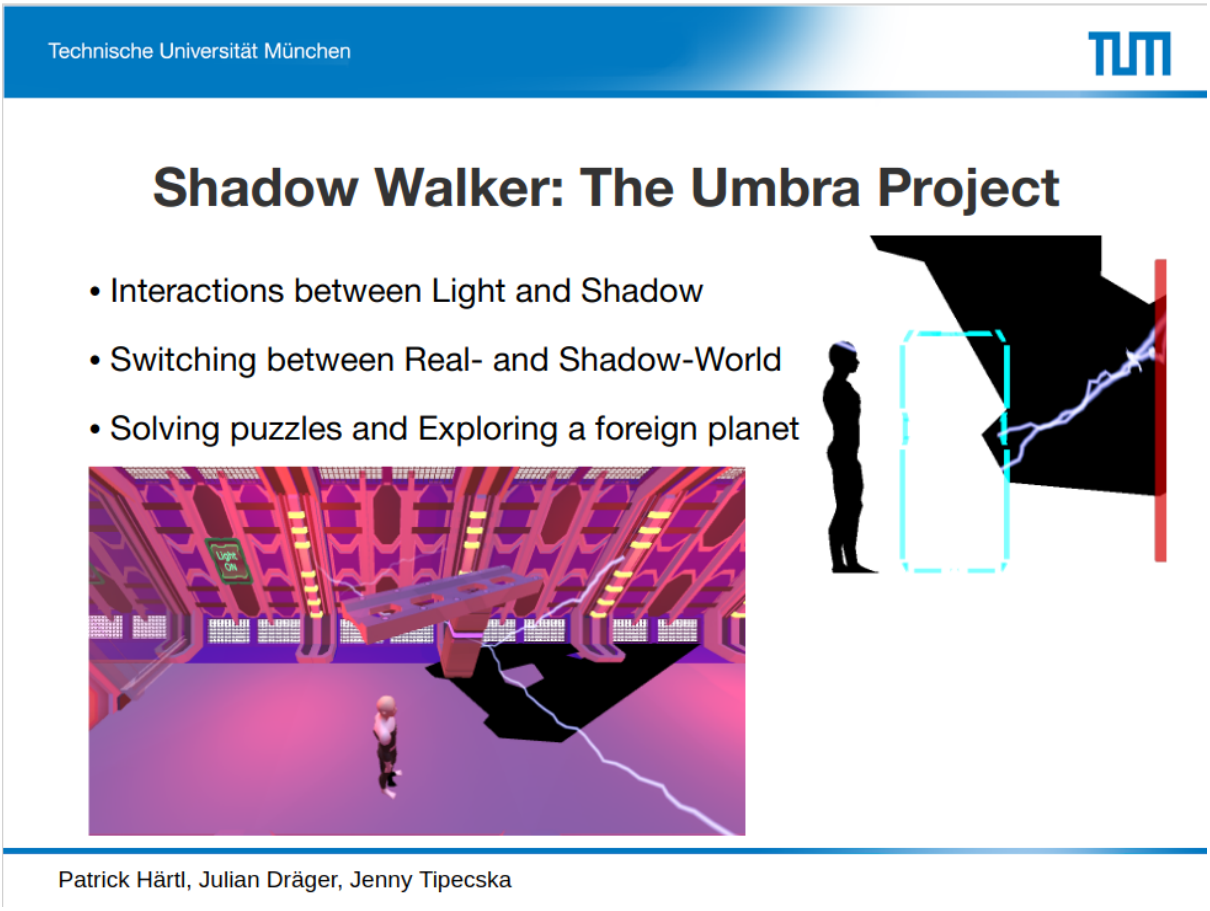
Individually I consider it successful as a learning experience since I have never worked on a game before with a group of people.

- What improvements would you suggest for the course organization?

Since the Games Master practical courses are completely unrelated to the Matching system, I feel like having the first meeting, group building and idea brainstorming phase at the end of the semester prior, would lead to students having more time to rethink their game ideas thoroughly and would create more time at the beginning of the semester and loosen the schedule at the end.

7. Demo Day

7.1 Slide



7.2 Poster

Technische Universität München

Shadow Walker: The Umbra Project

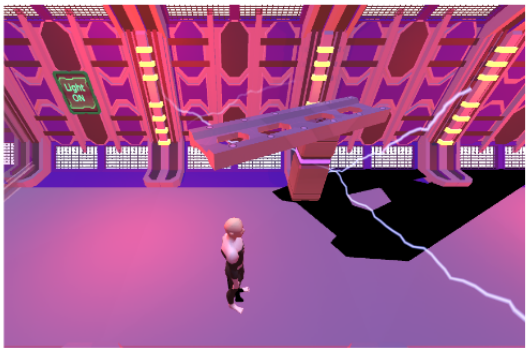
Patrick Härtl, Julian Dräger, Jenny Tipecska

Games Laboratory - Summer 2018, Technische Universität München

Puzzle-Solver Sidescroller

Main Characteristics:

- Interactions between Light and Shadow
- Switching between Real- and Shadow-World
- Solving puzzles and Exploring a foreign planet



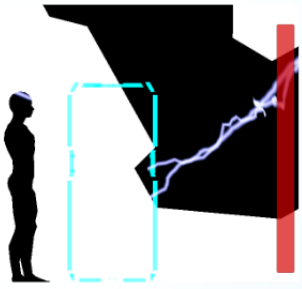
The Story:

While being on a mission to a secret test facility your spaceship gets caught in an unknown planets gravitational pull, unable to manoeuvre your ship out of the gravitational field your ship gets sucked into the planet's stratosphere. You quickly notice that your sensors are going haywire and are not able to identify the planets chemical composition. Time is running out, you know if you do nothing your ship is going to crash, the sudden realisation hits you that you lost control over all the navigational systems. While passing through the planets inner atmosphere a loud sound pulls you out of your focus, an intense sound and a lot of flashing lights refocus your attention on your ships overall health report. You lost your engines! Now in freefall, knowing you cannot save your ship from a disastrous crash, you try to run into your life-capsule to ensure you survive the impact.

Play our game and continue the story ...

Dynamic changing between two worlds in order to solve puzzles and advance through the story!

The Shadow-World and your Shadow Character



The shadow character is encountering an Obstacle in the Shadow-world

Characteristics of your Shadow Character

- Spacesuit is able to dematerialise character into shadow
- Spacesuit properties keep the shadow's shape unaffected by light
- Shadow can change back if the real character would not materialise inside of an object (blue outline)
- Change into shadow character if the character is not standing on a shadow
- Spacesuit is only a prototype; time in shadow-world is limited

Characteristics of the Shadow-World

- Shadow-world consists of all real obstacles' shadows
- Shadow character is able to navigate freely through real objects, gets stopped by shadows

Technische Universität München – Institut für Informatik