

Game Idea:

Beyond our Sight

26.04.2021

Team Two*2

Maximilian Hess

Oliver Jung

Viktoria Kirchleitner

Moritz Schirra



Game Description

Our plan for „Beyond our Sight“ is to create a cooperative online multiplayer game in which two players are trying to solve puzzles together. Their problem: They see the world through the eyes of their respective character, which is based on one side of the theme “Chaos and Order”. One is a boy, representing order and the other character is a girl, embodying the chaos. This results in significant differences in how they see their world even though they are in the same room.

The idea of a 3D side-scrolling adventure was inspired by the game “Little Nightmares”. This game has a similar gameplay style and camera perspective but is often criticised for the lacking multiplayer. We plan to incorporate ideas from this game and other games that use three dimensional puzzles to overall improve the level design for our game. Therefore, the addition of a cooperative multiplayer enhances the gameplay experience and allows us to create puzzles that reach beyond the three dimensional space.

Character Difference

As mentioned, our two characters are designed to represent chaos and order. This is reflected by their abilities and view on the world:

On the one hand, there is the chaotic girl that perceives the world as a colorful place. Roaming through a wild and unpredictable environment, the girl has access to many tools that can be used to solve puzzles. The way she sees the world allows her to find pictographic and artistic solutions unique to her character in order to progress on their way to escape the school. While chaos can lead to possibilities and open doors, both metaphorical and not, it can also be obstructive. An untidy environment filled with broken or misbehaving objects will be a challenge.

On the other hand, we have the orderly boy that has a monochromatic perception of the world. Due to his education he sees his environment as sorted and well-structured. In contrast to the girl, he is interested in reading and can extract information from books, maps and similar documents. This allows him to gather different information from his surroundings which is necessary for solving the puzzles on their way and achieving their goal.



Multiplayer Mechanic

On their own, both characters only have limited knowledge about and access to the objects around them. Therefore, the players will need to share their information with each other for solving the puzzles. Sometimes this could be done by just describing what they see and giving verbal hints, but in other cases an item from the world of one player might be needed in the world of the other player to be able to proceed further. This can happen because both worlds are only partially synchronized. For example, there could be a chair in one world but not in the other world. For these cases we plan to add a limited transfer ability for objects or parts of a scene. With this ability one player can select a part of his world which replaces the corresponding part in the other players world afterwards. Inside the selected space everything will be synchronized regardless of its actual synchronization state. In all other cases unsynchronized objects are not influenced by interactions with the respective element in the other world.

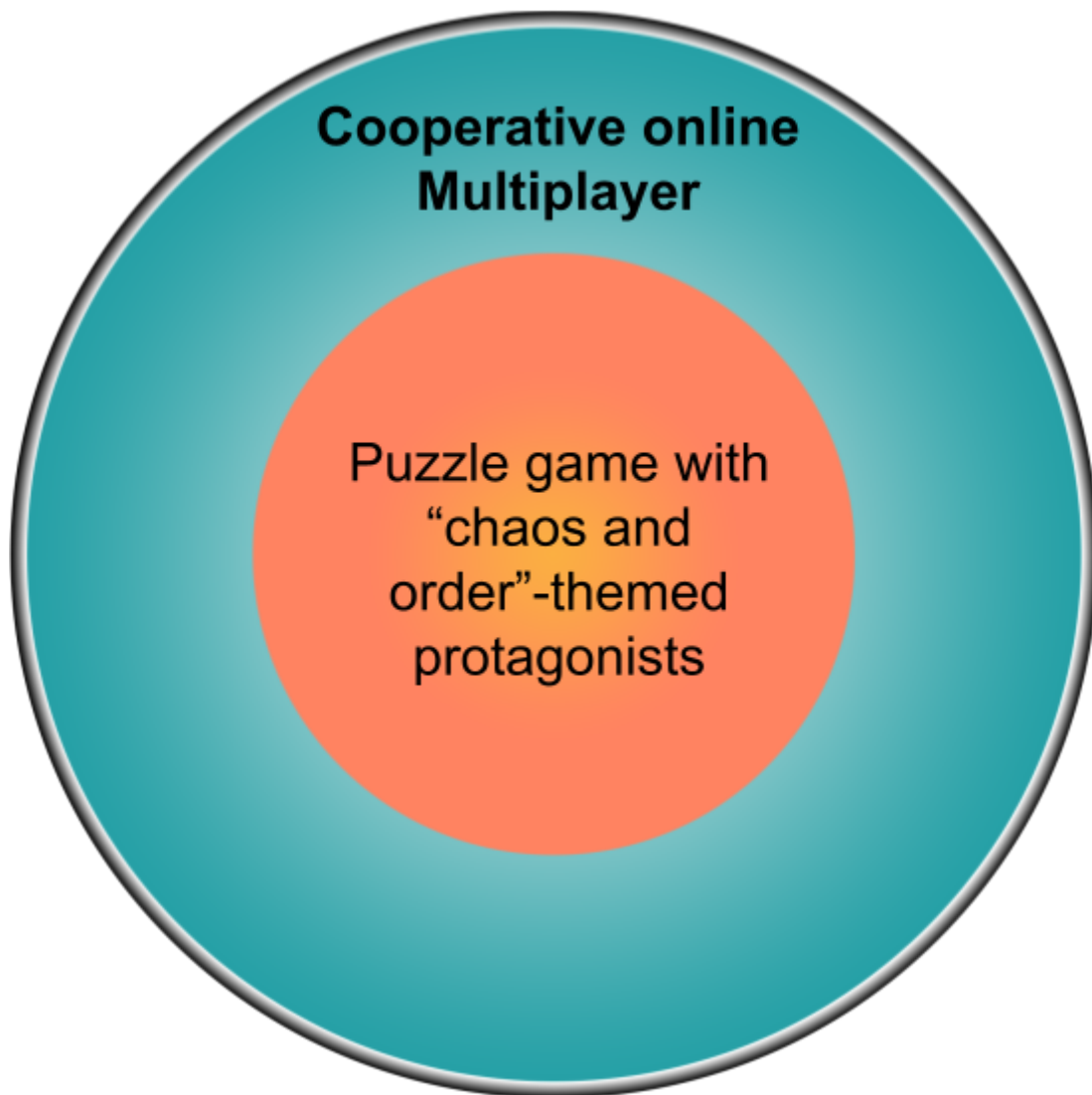
Puzzles will be designed in a way that contribution from both players and their unique abilities and visions are needed to succeed. This leads to interaction along the lines of gathering information individually in their respective worlds, communicating possible solutions and then each player working with what they have available in their world. If one cannot progress, they might need help from the other with synchronized objects that e.g. might have to be moved or opened first or items that need to be transferred from one world to the other.

Technical Achievement

In this project, the main challenge will be to implement satisfying multiplayer gameplay. This includes interesting abilities and equally difficult challenges for each character as well as contrasting yet charming worlds and interactive puzzles that encourage the players to take actions together instead of trying to solve them alone.

Problems could arise if one player feels like they're only giving hints for the other player and can't be active themselves. Also, there is the risk of frustration or boredom if the grey orderly world is acting too depressing on the players. Both could result in players wanting to play the "better character" and being disappointed if they had to play the other character.

"Big Idea" Bullseye



Development Schedule and Tasks

Layered Task Breakdown

Functional Minimum

- Camera & player movement
- First level (only one room with 1 - 5 puzzles)
- Basic interactions

Low Target

- Online multiplayer
- Basic assets
- Basic menu
- First level (multiple rooms with puzzles)

Desired Target

- Stencil shader and object transfer
- Better models
- Sound and music
- Attractive menus
- Narrative

High Target

- Complete menus (options and saving system)
- Polished levels

Extras

- Multiple levels
- Local multiplayer (splitscreen)
- Mixing perspectives over time to symbolize narrative
- Achievements

Timeline

(see PDF on [TUM Wiki](#))

Milestones & Task Distribution

I. Game idea pitch

| Task | Assigned to | Actual hours |
|------------------|-------------|--------------|
| Brainstorming | All | 6 |
| Project document | All | 10 |
| Presentation | All | 5 |

II. Game prototype

| Task | Description | Assigned to | Planned hours | Actual hours |
|---------------------------------|-----------------------------|----------------|---------------|--------------|
| Prototype | | All | 20 | |
| Project document & presentation | | Oliver, Moritz | 15 | |
| Level design | One room, one simple puzzle | Max, Viktoria | 30 | |

III. Interim report

| Task | Description | Assigned to | Planned hours | Actual hours |
|---------------------------------------|---|-----------------------------|---------------|--------------|
| Level design I | First cycle, basic level One Room with up to five puzzles | Max, Viktoria | 20 | |
| Level design II | Second cycle, refined gameplay/puzzle design | Max, Viktoria | 20 | |
| Multiplayer | Multiplayer integration, networking | Max, Moritz | 10 | |
| Puzzle design | Designing and testing interactive thought-through puzzles | Max, Viktoria, Moritz | 10 | |
| Shaders | Stencil shader for object transfer | Oliver | 10 | |
| Basic Assets | Simple character models | Oliver | 10 | |
| Basic Menu | Start menu, joining and leaving multiplayer game | Oliver | 5 | |
| Interactions | Basic interactions around 1-2h, character dependent interactions 8-9h | Viktoria | 10 | |
| Camera & player movement | Side-scrolling player and camera movement | Moritz | 10 | |
| Project document & presentation | | All | 20 | |

IV. Alpha release

| Task | Description | Assigned to | Planned hours | Actual hours |
|----------------------------|--|----------------|---------------|--------------|
| Level design III | Third cycle, design rooms for object transfer, narrative | Max, Viktoria | 26 | |
| Better Menus | Improved design, pause menu | Max | 5 | |
| Better Models | More detailed character models | Oliver | 20 | |
| Object Transfer | selection / transfer logic, (un)synchronized objects | Oliver | 6 | |
| Sounds & music | | Oliver, Moritz | 10 | |
| Game ending | Winning conditions | Viktoria | 5 | |
| Visual effects | | Moritz | 10 | |
| Puzzle design | | All | 30 | |
| Bug fixing | | All | 20 | |
| Project doc & presentation | | All | 16 | |

V. Playtesting

| Task | Description | Assigned to | Planned hours | Actual hours |
|---------------------------------|-------------------------------|-------------------|---------------|--------------|
| Playtesting Survey | Create survey for playtesters | All | 8 | |
| Playtesting | | All & Playtesters | 50 | |
| Bug fixing | | All | 30 | |
| Evaluation of feedback | | All | 12 | |
| Make changes based on feedback | | All | 40 | |
| Project document & presentation | | All | 16 | |

VI. Public presentation and conclusion

| Task | Description | Assigned to | Planned hours | Actual hours |
|---------------------------------|--|-------------------|---------------|--------------|
| Bug fixing | | All | 30 | |
| Polishing | Balancing puzzle difficulty and player contributions | All | 40 | |
| Trailer | | Moritz | 15 | |
| Project document & presentation | | All except Moritz | 16 | |

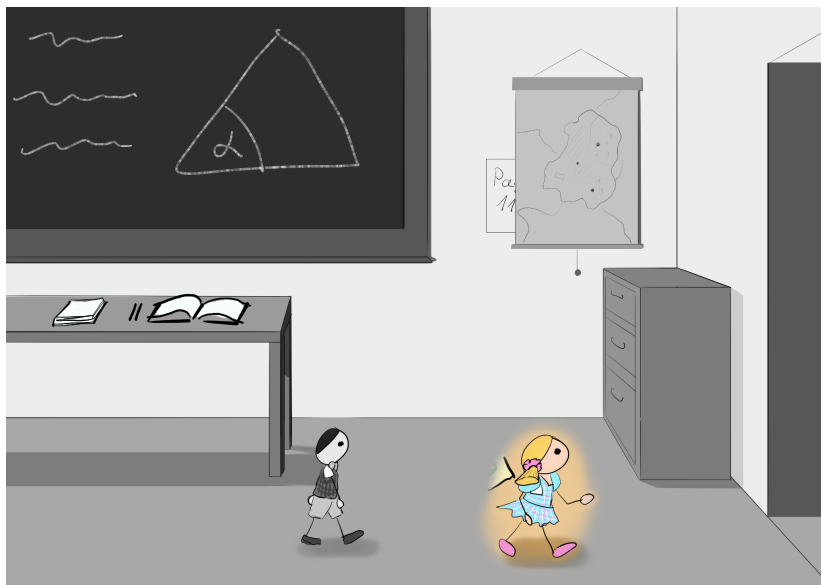


Assessment

The game will fit right into the recent trend of cooperative multiplayer games. Our players will have the possibility to work together, each one with a different set of skills so that both players make a valuable contribution to the progression of the team.

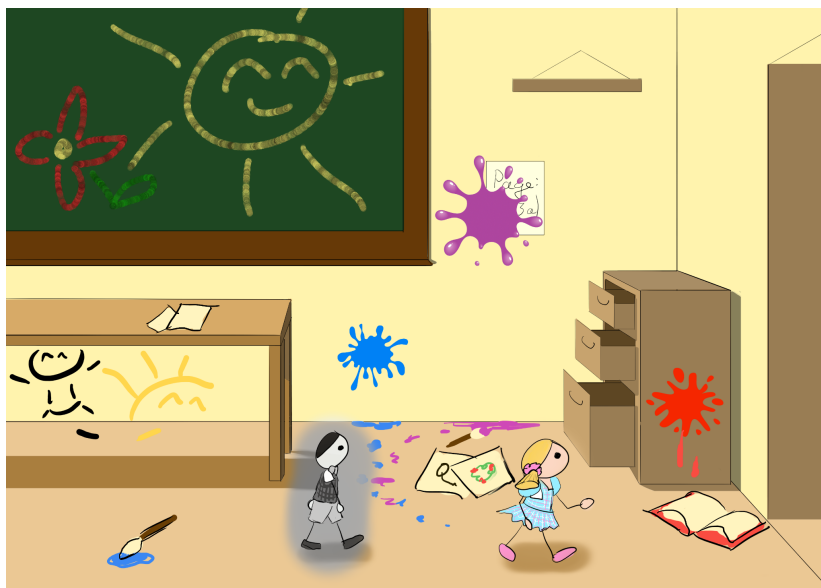
The game can be enjoyed by any two friends who always dreamed of escaping school together and who would like to spend a relaxing evening together solving riddles. We're currently not planning on any type of punishment system for failed tasks so our game will be a stress-free and pleasant experience which will be enhanced even further by the visual style and the heart-warming narrative about two children out of different worlds becoming friends.

Sketches



Top: A scene as it would be seen through the eyes of the orderly boy.

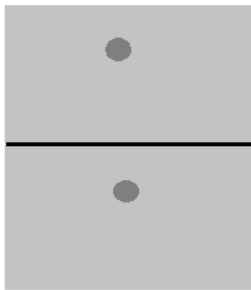
Bottom: The same scene but now as the chaotic girl sees it.



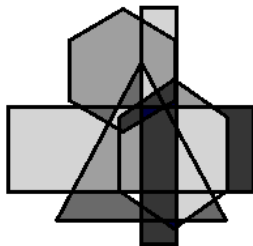


Top: A sketch of our two game characters.

Bottom: Depiction of possible puzzle elements and how the characters see them.

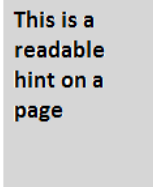


Drawers closed

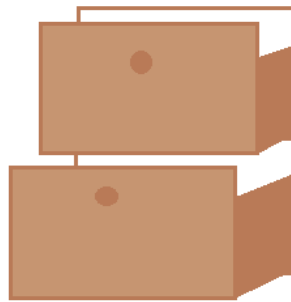


Colors reveal a hint due to the grayscale mapping

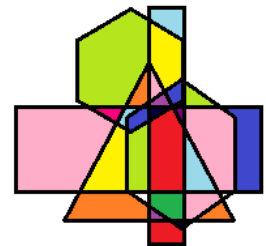
Words are readable



Order

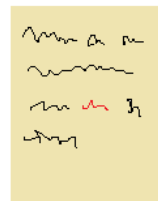


Drawers open

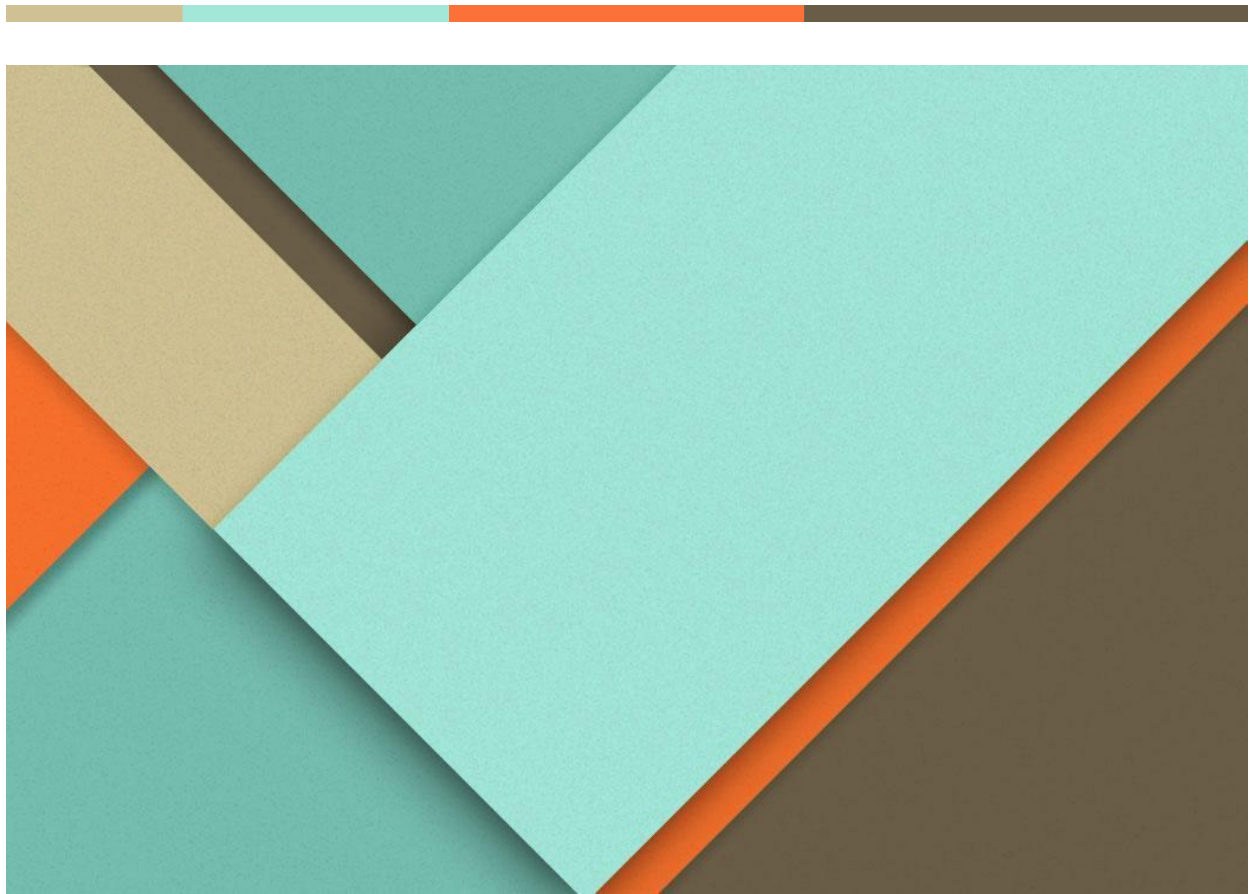


Colors are chaotic and don't reveal anything

Words are not readable. But colors are visible



Chaos



Game Prototype: Beyond our Sight

May 2021

Team Two*2

Maximilian Hess

Oliver Jung

Viktoria Kirchleitner

Moritz Schirra



Goals

Cooperative puzzle games are not new and there are multiple different examples of such games which verify that the concept of multiplayer puzzle games works. Thus, we do not need to test this whole aspect of our game. However, our project differs from other examples of the same genre. In contrast to games like e.g. “Portal 2” (cooperative mode) the players in our game exist in parallel dimensions instead of being separated by physical barriers. Combined with their dissimilar abilities, this makes the characters not exchangeable and influences the design of our puzzles. For example, we do not aim for puzzles focussed mainly on timing/precision like in “Portal 2” but rather want to prioritize the task of communicating and combining information.

Another example of a similar puzzle game with different types of players is “Keep Talking and Nobody Explodes”. Similar as in our game, the players are being provided with different information and need to combine their knowledge in order to succeed. However, in this game, the two player types are strictly separated and have a completely different gameplay. Compared to this approach, we did not want to have one player acting as a sort of ‘expert’ merely giving hints to the other player who is actually solving the puzzles. Of course, this has a major influence on our puzzle design, too.

As the puzzles and the communication/interaction between the players are the most important part of our game, we want to test the mentioned differences in our approach with our prototype. Our main goal is to check how good the collaboration works if both players have no idea what the other player is seeing. Furthermore, we want to demonstrate some of our puzzle ideas in order to see how difficult they are when one can only see half of the solution. Another important aspect we want to consider is how the style of the different perspectives influences the players' experience.



Prototype structure

Our prototype consists of a pair of equivalent rooms with objects inside them. It represents the two versions of one room inside our game. Each scene of the prototype consists of one half of a shoe box with objects like a table and a closet made out of paper in it. The two playable characters are represented by simple lego figures that are movable through the respective scene. These two scenes are placed with the back to each other, so the players cannot see the room of their partner. This allows us to construct a similar setup as in the planned game.

As our game is a puzzle game there was no need to simplify our basic game mechanics or rules. However, an additional third player is necessary to allow actions that would normally be part of the computer's tasks e.g. synchronisation of the scene since both of the regular players are only allowed to see their own scene. Furthermore, the third 'Computer' player makes sure that all movements made by the players are actually allowed in our game, e.g. the book on the table is only reachable if the second player helps the other player climb up.

The puzzle in our prototype serves as a blueprint for the ping-pong structure our later puzzles will follow. This means that when solving a puzzle, both players will be able to contribute to the solution more or less alternatingly, as each intermediate step by one player allows the other to reach the next. This prototype is able to demonstrate this approach and allows us to evaluate this approach before its implementation.

The two separate boxes of the prototype allow us to analyse our multiplayer experience as well. This way a short roleplay about solving the puzzle already gives insight on the multiplayer dynamic of the game and how both players experience their different perspectives on the scene. Trying out both characters also helps to assess whether one character is considered more fun to play in this scene of the prototype.

Rules & Procedure

As the Prototype is a paper model of the game, there needs to be a set of rules to follow when playing or testing it. To enforce these rules as well as for handling the interaction with the paper world, a third player, simulating the program and the game's feedback, is taking part in the prototype test.

During the game, players search their room for hints and inform their teammate if they could gather any. Their teammate can then use these hints to reach information that was previously not available to them. However, many of these hints are hard to implement in paper, so the third player helps out at that point. The third player also handles the synchronized objects, which means objects that have a counterpart in the other player's world and are moved or changed when their counterpart is interacted with.

Further rules that have to be respected during a prototype test run are: Players must not look at the other player's scene or add objects from outside to their room. They also must not rearrange things in the room if the third player does not allow it, as this means this would be an action that will not be implemented in the actual game. As they are playing children characters, players also need to respect their characters' reach. This is planned to become an important factor in the puzzle design.

The following steps describe how the prototype should be used:

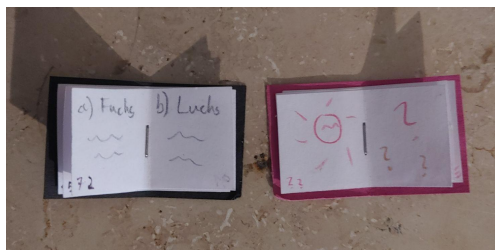
1. The characters enter a room together
2. They face an obstacle / puzzle
3. Each player searches for hints
4. The players communicate with each other and try to combine their information
5. They interact with the objects around them
6. The third player applies changes to the room
7. Go to step 3 until the players have found the solution
8. Proceed until the next obstacle / puzzle (2) or to the end of the room
9. The characters leave the room together

Physical prototype

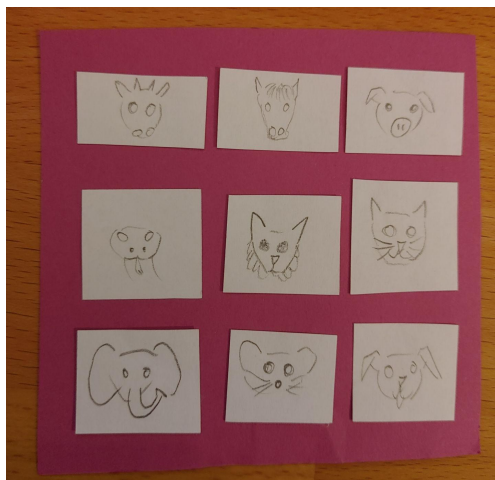
As can be seen in the picture on the right, we build a prototype of our game out of an empty shoebox. The box shows the same room but from two different views. The view of the girl can be seen on top and the view of the boy on the bottom. To play the prototype, both boxes are placed so that each player can only see their own room. A third player representing the game system can see both rooms and moves the figurines of the players in both rooms simultaneously.



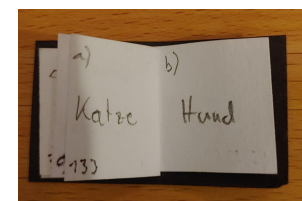
The objects look differently for each player, e.g. the drawers are only open for the girl meaning that only this player can reach the box with the key inside. On the other hand, only the boy is able to read the book on the table as can be seen below.



When trying to open the box, the girl is faced with a couple of buttons with animals on them as can be seen on the left. A hint for the right button is written in the book which the boy can only reach with the help of the girl. To know which page is the right one, the two players need to combine their views on the note on the wall to reveal the solution (Page 133 a).



Page 133 a) of the boy reveals that the wanted animal is a cat. Now the girl can press the cat button, acquire the key and with the help of the boy put the key in the lock on the door. The two of them are now able to flee!





Experience

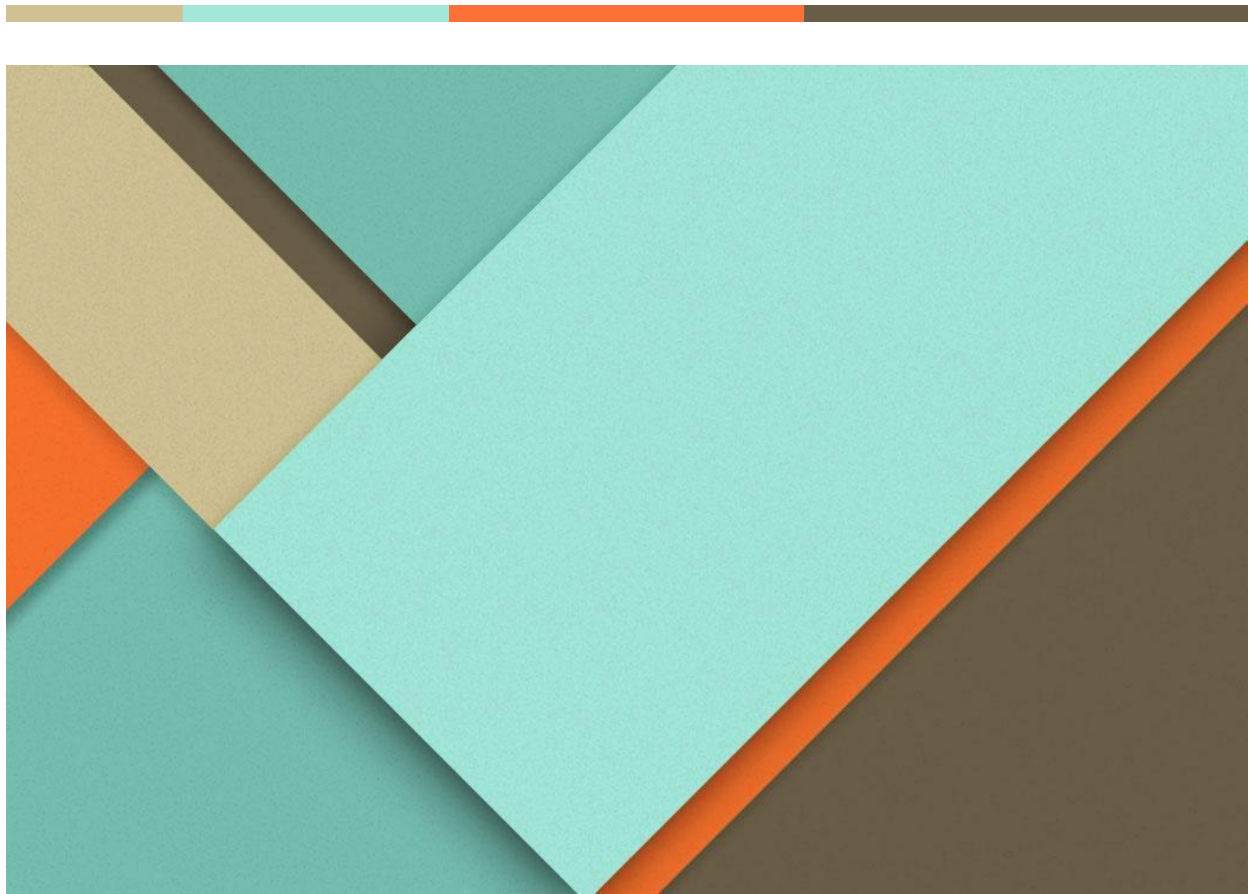
While building our prototype and designing our puzzles we discovered that this prototype does only enable the players to reveal specific objects but not whole parts of one room to the other player. Thus, it will not showcase our view-sharing ability. Additionally, the prototype cannot convey the same immersion we look for in the game, as the prototype puts the player in a different perspective than the game will. Instead of viewing the scene from a low-to-the-ground viewpoint of a child, players experience the prototype from a top-down “dollhouse” view. This makes exploration and the search for objects in a room less immersive as it is planned for the game.

Revisions and Discoveries made after testing the prototype

During playing, we discovered some possible issues with our puzzles. For example, if the room contains too many objects the players might not know which objects are relevant and where they should begin in order to solve the current puzzle. This is a disadvantage compared to the approach of “Keep Talking and Nobody Explodes”, where at least the expert has information about which elements are relevant and which are not. In order to prevent this problem we plan to add a highlight system for interactable objects.

Furthermore, multiple objects of the same type could lead to misunderstandings between the players, especially if those objects are close to each other or can't be distinguished easily. Therefore, each room / puzzle should be evaluated regarding its complexity and simplified if needed. All objects in the same room must be either clearly distinguishable or must be located at the same position in both worlds.

When crafting the paper prototype, we realised that our puzzles also work without the planned ‘sending over’-mechanic. Since we already have a couple of planned mechanics, we decided to move the ‘sending over’-mechanic from desired- to high-targets since we would rather use the time to focus on puzzle and level design. We also asserted that our design of the orderly side of puzzles still needs more focus and inspiration until we feel like it is as fun to play as the chaotic side.



Interim Demo:

Beyond our Sight

May 2021

Team Two*2

Maximilian Hess

Oliver Jung

Viktoria Kirchleitner

Moritz Schirra

Task Progress

Multiplayer Implementation

In our multiplayer implementation, we decided to use a client-server model, specifically a “listen server”, so we do not have to spend resources on the implementation of a dedicated server. This structure allows one player to play the game and also to provide it as a server that allows another player to connect as a client. Due to this structure, the client has more delay compared to the server player. However, this does not affect our game as it is designed as a cooperative multiplayer where both players work together. Because of that, the “listen server” structure is perfectly fitting for our project.

We integrated the core functionalities for this client-server structure very early to then immediately replicate each new action correctly. This also gave us a very early look on what the multiplayer will feel like in the final game, which helped us in the design process. The replication of actions in Unreal Engine means that we have to run most actions twice, once on the server and once on the client, thus essentially executing the same logic on both. If we do not do this, the server would act as a control instance for the client, so the actions of the client would be overridden by the server.

Right now, we have only successfully tested the multiplayer in Unreal Engine’s play mode. A real online connection has not been part of our test yet.

Interactions and Puzzles

Both characters are able to move freely in three dimensions, both in normal walking speed but also by sneaking. The latter is done by holding “Shift” and will later allow the boy to pass by open doors, evading the eyes of the teachers. Jumping is also possible, pressing “Space” and is generally needed to climb smaller objects. However, as climbing is important to explore the full extent of the scenes, the players need to be able to climb larger objects as well. For this, we implemented crouching, which is activated by pressing “C”. A crouched character cannot move but allows the other player to jump on top of them and from there to even higher places.

Multiple forms of interaction with the world are also already implemented. Players can interact with books in the scene, read them and turn pages. These books are shown to the players as a large double page in the foreground of the screen. Each player sees a different set of pages based on their characteristics. In a similar fashion, a set of buttons on a puzzle

box can be shown to the players. They can then arbitrarily click on these and get a return value depending on the secret code behind the buttons, as they are primarily used for certain code based puzzle solutions. This puzzle box is supposed to contain a key which opens the door to the next room, however the spawning of the key is not yet implemented. Nevertheless, the key which later will be able to be picked up and used on the door is already a part of the interim demo but the visual part of the picking up process still causes errors so we excluded this from the demo. Furthermore, we are currently working on pushable and movable objects that the characters can use to reach higher up areas but this still needs a couple more hours of work before being fully functioning.

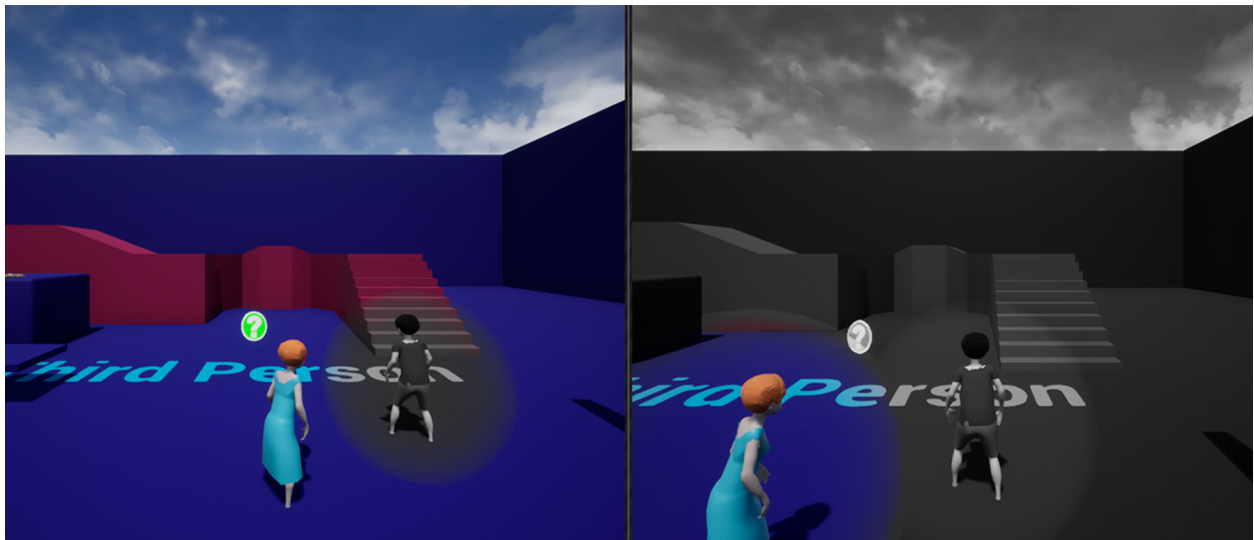
Assets and Animations

We already integrated self-made models for our protagonists and assigned them animations for all possible actions and movements. They play correctly for both server and client and are fitting well for actions like crouching and picking up the key. For general assets in the scenes, we will work with a mixture of self-made and free downloaded assets from public stores. We already have chosen specific ones that fit our style and levels but have yet to integrate each of them into the Unreal project. We are taking great care to work with a coherent art style, so that none of the objects feel out of place. Furthermore, we are holding back with the model integration until the level design is finished and the core functionalities are implemented so that we have a full vision of how they should look and what objects we need in detail. Furthermore, we are hoping to add character specific animations as a nice to have.



Shaders

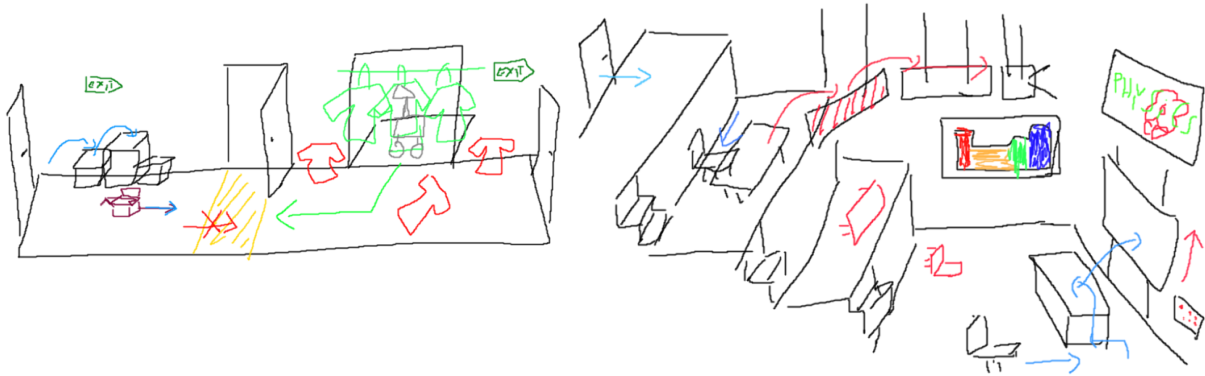
For creating the visual differences between the worlds of the female - and the male character we use two mesh shaders and one post processing shader. The latter is only present when the player controls our male character. It desaturates the whole view except a small area around the female character and thus creates the black and white world of the boy with a “window” to the colorful world of the girl. This “window” is defined by the mesh shader attached to the girl, which changes the value inside the stencil buffer wherever a fragment is rendered with it. Furthermore, it is responsible for manipulating the colors inside the “window” in order to smooth the edge between the gray world and the colorful area which occurs due to the use of the stencil buffer. Similar to this shader, the mesh shader of the boy is used for changing the colors inside a sphere around the character. However, instead of desaturating the edge of the characters area this shader smoothly desaturates the colors towards the middle.



Level Design

The general level design and the design of puzzles is close to finished. Five completed rooms, each with very different and for the most part not repetitive puzzles exist on paper, which is the extent we planned for the desired target. They are also connected meaningfully, showing the escape from the school through different departments. The rooms differ greatly in layout and solution, but follow the same principle of progressing from left to right with the implementation of the camera in mind. The puzzles use the full extent of our implemented and planned interactions. Furthermore, they utilize the chaos

and order views of the different characters as well as the chaos and order properties of certain objects in the scenes. Having the level design completed allows us to fully focus on implementing them in the engine with the full amount needed interactions and content in mind. This prevents us from giving way to feature creep and implementing something that turns out to be unused for the desired target.



Our puzzle design documentation consists mostly of sketches and an additional, extensive text-based solution, which also captures possible thought processes of the players and how they would find their way through the room.



Challenges

During the implementation, a few challenges occurred. First we had problems with liftable items like the key, which we need to open doors. Due to a not yet resolved bug, the player's movement is impaired while the figure is holding the key. Thus, we decided to let the pick-up animation play without actually grabbing the key model for now.

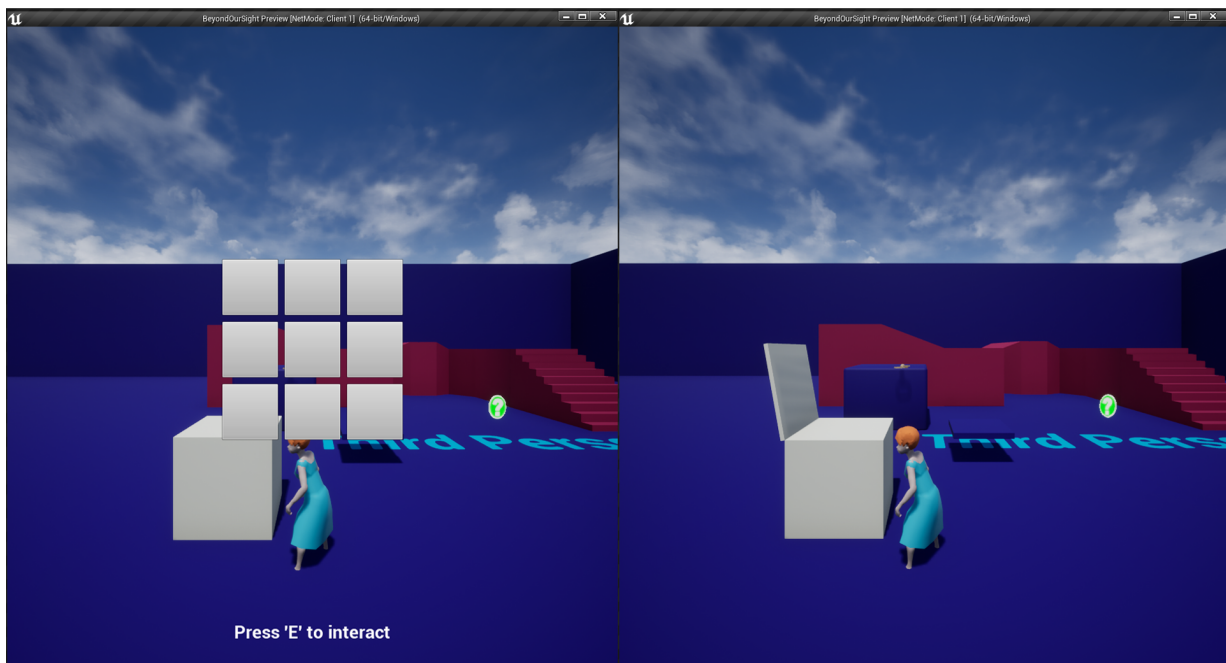
Furthermore, we faced some problems during the implementation of the multiplayer. The different types of replication on client and server side respectively lead to some inconsistencies regarding animation and object behaviour in the two perspectives. Most of the problems have been fixed so far but it also took more time than expected and it will again take some time in the alpha phase to achieve flawless replication.

Additionally, we have yet to implement the options menu to create and join multiplayer lobbies. While fundamental menus were originally intended for the interim demo, we prioritized them lower during the development since real online multiplayer is not yet implemented, and they thus were not created in time. Game menus are now set to be implemented as soon as we get closer to testing the actual online functionality of the game.

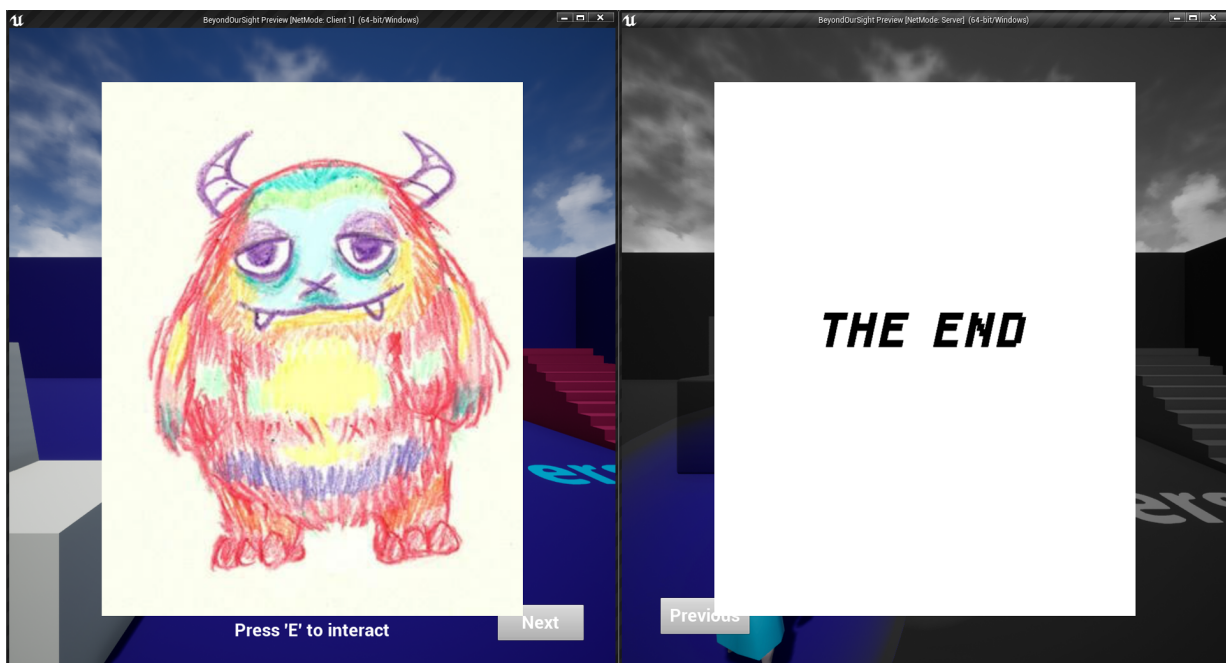
Design Revisions

Currently, we are very content with the design decisions we made up to the prototype. Our original concepts could be implemented without considerable conflicts so far. Up until now, only one design revision had to be made. Due to serious problems with the camera assignment in our multiplayer, we changed the handling and angle of our camera to a better supported design. Right now, the camera is very similar to the default camera of the default Unreal 3D scene. However, our plan for the alpha is to show the scene from an upper left corner. Fortunately, this decision happened early enough for the level design team to pick up on it. They then planned the scenes in a way that placed all important content more to the back-right of the rooms, as not to miss it as a consequence of the new camera angle.

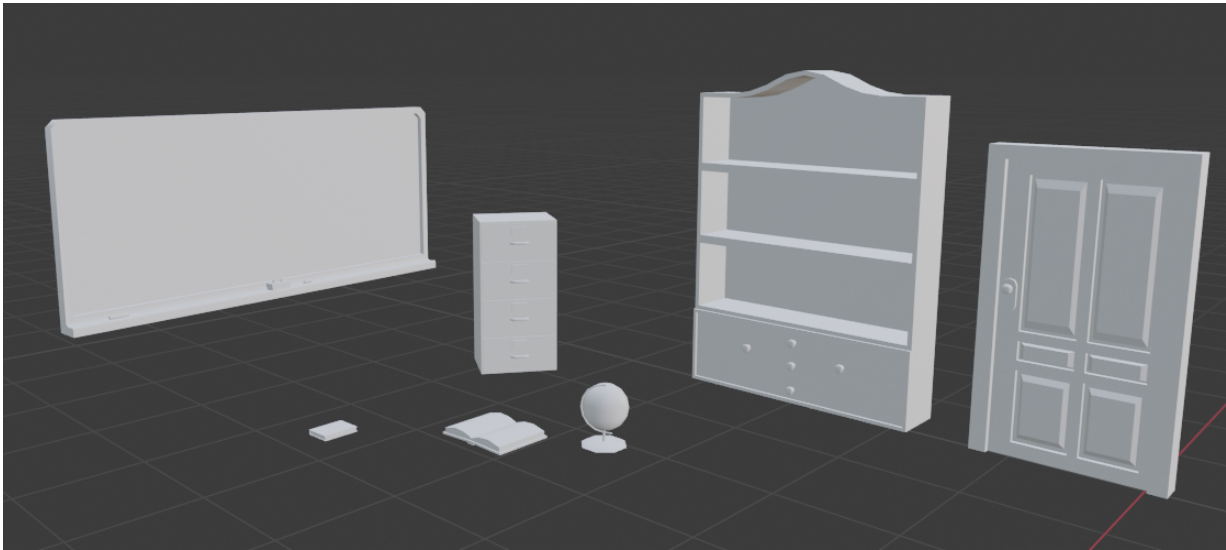
Progress in Pictures



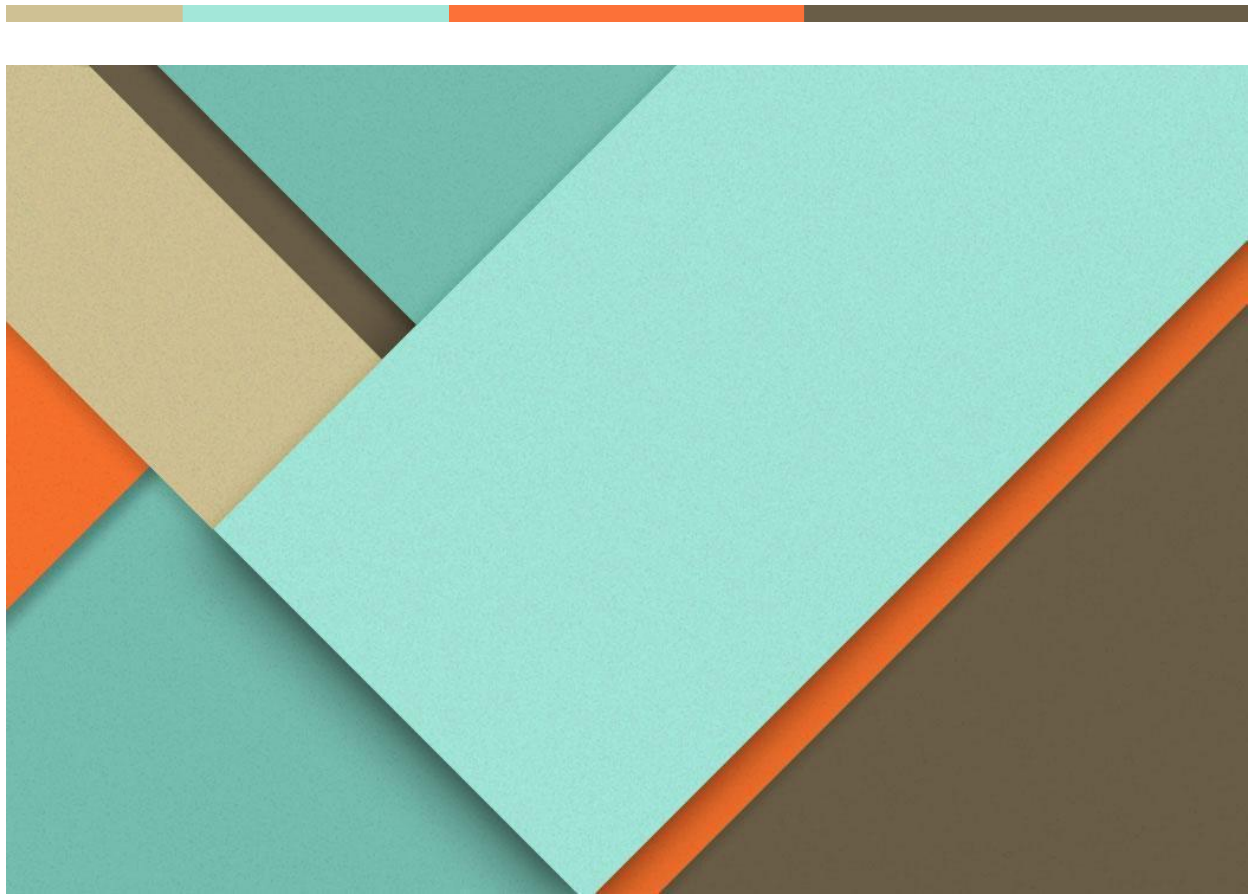
This temporary model of a box can be opened, if the correct code is entered on the buttons. The left picture depicts the code panel, the right shows the open box.



The book in the scene contains different text and images, depending on the played character. On the left side, the girl only sees colourful pictures while the boy on the right perceives text.



A few 3D assets to be used in our classrooms. We chose an art style that goes along well with our protagonists.



Alpha Release: Beyond our Sight

June 2021

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Multiplayer Implementation

Changes & Additions

A crucial part of our project is the online multiplayer. We only used the simulated server-client system of the Unreal Engine to test our implementation so far. For the next phase of the project, a working multiplayer system is necessary and important, so we started to implement a real online connection system for the game. To achieve this, we make use of the Steam client and account system, so only a Steam account is necessary to connect to another player and play the game online.

Furthermore, the communication between the players is very important for the core game idea, so we wanted to allow communication directly in the game. As a result we implemented the possibility to use voice chat in the game using a push to talk system. This way the players can communicate and solve the puzzle together by pressing the corresponding voice button.

Challenges

Central part of our game is the multiplayer. Unreal Engine's replication system serves a good base for networking however, getting it to work correctly does require some extra effort from time to time.

Design Revisions

We realized that the nice-to-have split screen mode for the local multiplayer does not work for our game idea. The core idea of the game is the missing information of each player respectively as well as the communication between the players, so it would not work if both players can always see the view of the other player during the game. Nevertheless, we want to provide local multiplayer, so we implemented a connection option using networking via LAN or WLAN. This solves the problem of a shared screen and information without the need of an internet connection or a Steam account.



Interactions and Puzzles

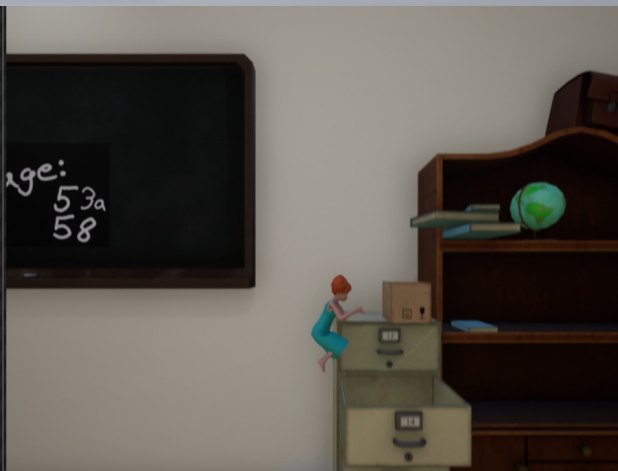
Changes & Additions

During the Alpha release period, our protagonists, who are now called by the names Alice and Anton, received new abilities to interact with the world around them and also some polishing on already existent ways of interaction.

One of the new features in this version is the fully implemented stealth gameplay. There, both players can go into stealth mode by holding “Shift” while walking. However, this has different effects on the different protagonists. Contrary to the boy, Anton, the troublemaker Alice is even less tolerated in the hallways or in restricted areas. Thus, she cannot pass either the open door of the teachers’ office nor surveillance cameras without being sent away. Anton on the other hand is much more popular with the teachers. If he is quiet he is allowed in the hallway, as he is expected to be on an important errand anyway. Consequently, Anton needs to help his friend by using a larger movable object to shield Alice from the teachers’ vision. This gameplay feature has been polished from the interim demo and is now fully functional with both protagonists. When an object is moved by the boy across a stealth zone, the girl can hide behind it while sneaking and pass through the stealth zone this way. This is necessary to complete room two. The first stealth zone is visually highlighted by a strong “rectangle light” that throws obvious shadows when passing through. We might add an option to pull objects instead of just pushing them, but this depends on the playtesting results indicating a need for that feature.

Furthermore, crouching with a character to enable the other player to climb higher places now works correctly, fixing previous problems with wrongly behaving colliders. This feature is already needed to climb the shelf in the first classroom. The game now also includes multiple pickupables. Not only the key but also a crowbar can be acquired and used to break certain things to allow for progression through the level, bringing more of the chaos-theme into the gameplay.

Progress in Pictures



Assets and Animations

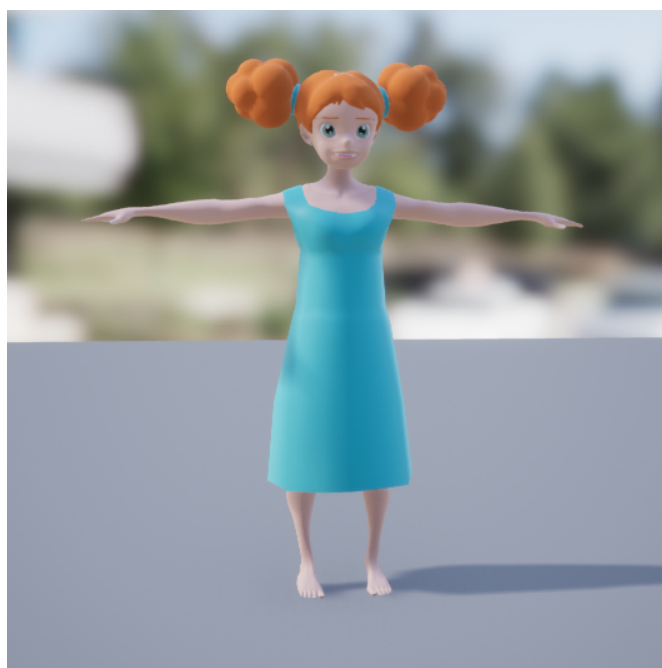
Changes & Additions

Since the Interim Demo, we added a lot of assets to the game. So now all objects in the rooms as well as furniture have their final models and textures instead of the simple white cubes they consisted of. This also applies to textures for the walls and the floor, they now have a distinct texture. Objects like doors also have the corresponding opening animation fitted to their new model.

We also improved the models for our player characters, so e.g. Alice, the girl, now has a new hairstyle. Furthermore, some errors regarding the character animations have been fixed. Until now, during some animations body parts from the characters clipped through the clothes. We fixed most of these issues by selecting parts of the models that are simply not made visible by the engine, so they cannot clip through the clothes anymore. Additionally, we reduced the complexity of our models by removing unnecessary vertices and baking details into textures.

Regarding the animations of the characters, we speed up some of them to improve the user experience during a playthrough. Furthermore, the pickup animation for e.g. the keys now do not only play the animation but also actually pick up the keys so the characters can hold these interactables in their hands.

Progress in Pictures



Shaders

Changes & Additions

In the Interim Demo we had some problems with the areas around the players. From the perspective of Anton, the boy character, the direct surroundings were displayed a bit lighter than the rest of the scene and there have been some issues with the area around Alice, the girl character. We fixed those problems and now this visual effect works as intended.

Furthermore, we also added objects that can only be seen by one player. An example for these are the drawer cabinets. They are closed from the perspective of Anton but Alice sees them open and can jump on the drawers. These objects are a core part of all puzzles and can be found in every room. This feature reaches from limiting certain information to one view to making entire platformer passages exclusive to one protagonist. To identify these objects and to work with them is one of the most interesting and unique challenges for the players in our game.

Progress in Pictures





Level Design

Changes & Additions

As is necessary when beginning the playtesting period, all five rooms of the level that we aimed for in our high target are fully built and almost fully functional. They are diversified and thought-through enough to now undergo the polishing that comes with the playtesting feedback. Each room comes with its own layout, theme and puzzle. We also alternate between longer, complex puzzles and shorter ones, as to not exhaust players in the process. Thus, room number one, three and five are the core of the game. In addition to the multiple steps of the puzzle, which players usually solve in a ping-pong style by utilizing each protagonist's unique skill set, they also involve a secret code to be entered at the right place. However, these codes are never a mere number but instead they are symbols / categories more visually and logically connected to the school setting. Alice e.g. recognizes images of cute animals and can differentiate between different colors of a color scheme while Anton can enter the letters of the notes of a music sheet that the musically interested Alice describes to him.

Furthermore, we added checkpoints that allow for a small setback for players when they make a mistake during the two stealth passages in room two and five. The checkpoints are

set when entering a room, as this is the most comprehensible point in time. They could also be used in a save system, in case we add one later, either as an extra or if it turns out sought-after during playtesting.

We also started adding more clues and wayfinding indicators in each room, often only visible or readable for one protagonist. Right now, clues are only integrated at certain points in the game, as we do not want the puzzles to become too easy. These clues will become more numerous as soon as we have the feedback to know which parts of the puzzle are not intuitive enough yet. The nature of hiding some clues and wayfinding assistance from one protagonist even encourages more of the communication between players that we aimed for in the first place.

Challenges

Right now, it is still hard to estimate how difficult these puzzles will be for new players that have not seen footage of the game yet. As an example, certain mechanics like pushing objects and the stealth gameplay might be quite intuitive in isolation, but it is hard to predict if they can be easily enough understood and applied to the puzzles at hand. Even so, the playtesting phase will give us valuable insight in that regard and our ability to add more varying clues and hints to the puzzle allow us to settle on the difficulty level we strive for.

Progress in Pictures





User Interface and Menus

Changes & Additions

Unreal Engine's UI system ran into some issues in the multiplayer context so we've been holding back on some UI elements until now and added them now for the alpha release. Also, some of the overlays e.g. for the puzzle boxes needed fixing since the black-and-white post-processing filter for Anton's perspective didn't apply to the UI elements. Furthermore, there now exist dialogue boxes for both protagonists that are used to express the thoughts of the characters and therefore relay information and hints to the players.

Progress in Pictures



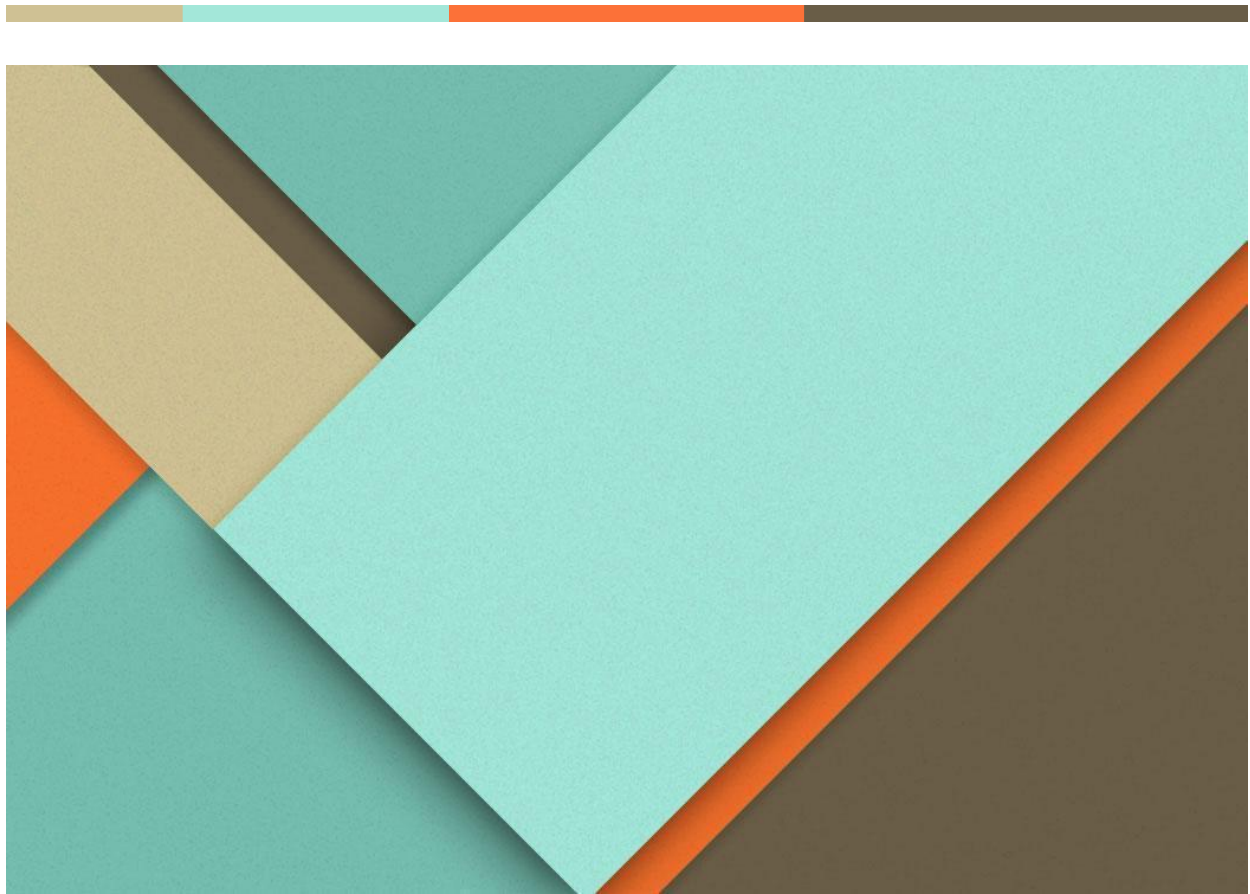
Beyond our Sight

Host

Join

Options

Quit



Playtesting: Beyond our Sight

June 2021

Team Two*2

Maximilian Hess

Oliver Jung

Viktoria Kirchleitner

Moritz Schirra

Playtest Preparations

The Playtesters

To acquire playtesters, we asked friends from various backgrounds to play our game. Only prerequisites were a windows computer, a stable internet connection, a microphone and an existing Steam-account since our multiplayer connects via Steam. In general however, hardware strength and specs may vary across testers, which mirrors the real world case of very different players trying out the final game.

In total we had 13 playtesters. Most of them were between 18 and 30 years old and had experiences with video games before playing our demo. In most cases, the testers that played together knew each other or were friends beforehand, as that is how cooperative multiplayer games are usually played.

Preparations


Since we developed a multiplayer co-op game, we needed two playtesters to play the game at the same time and be able to communicate with each other. Therefore, we set up a Discord server on which we made all necessary information accessible and invited our players.

To get feedback on the game and potential bugs, we created a questionnaire with Google Forms containing general questions about our players, the players satisfaction level, controls, UI, the puzzles and potential bugs. There, players also received a general introduction to the game and its setting and got to know our protagonists. Furthermore, we built our game and provided our testers with a link to download it.

Test Structure

Before starting the actual playtest, we asked our subjects to answer a couple of questions about themselves and their background in gaming.

After finishing, we provided them with a short description of the general theme of the game and the basic controls. The playtesters would then proceed to play the game on their own with us interfering only when asked for help.



Afterwards, our subjects either choose to play the game a second time, this time out of the other perspective, or to directly finish the questionnaire with questions about the demo, satisfaction level, different aspects of the game and possible challenges and bugs that they encountered. In some cases, one of us was present silently during the testing to get more insights on how players approached each puzzle and what common pitfalls might be. Once, the playtesters even made a cut video of their playthrough to help us further.

Playtesting Results

During playtesting most testers encountered situations where the view on their character was blocked by another object (e.g. a table). This led to moments of confusion because they could not see what their character was doing and where they were at the moment. Furthermore, the testers specified they were missing more information about the environment and also feedback for interactions as well as the successful completion of puzzles, especially regarding right and wrong button presses. Additionally, they wanted some more hints on what they need to do next, because some testers interpreted parts of the rooms / puzzles incorrectly and were confused as the puzzles could not be solved with their approach.

Concerning our narrative, the players indicated the setting and characters were not introduced well enough inside the game. Therefore, they often did not understand why one character is able to do a specific task (e.g. sneaking through an observed area) and the other is not able to do the same. Especially in the last room of our first level this behaviour frustrated multiple testers as only one of the players had the opportunity to enter this area and the other one could not even see what was happening in the other room. In this case one player had to wait until the other solved a part of the puzzle and could not offer any help. This was stated as boring.

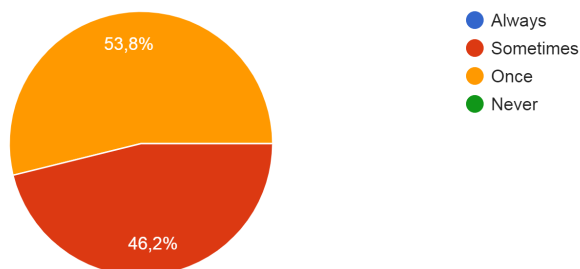
Other problems arose from multiple bugs which our testers faced during playing. Some of them made the rooms more challenging, but they did not prevent the players from progressing entirely. Most of these issues have been fixed in the meantime. The most common one was an issue, where movable chairs could be shoved to a wall and were thus not usable anymore, as there is no pull functionality. This is now prevented by a small ledge on the ground which stops the chair ahead of the wall. Another problem arose with items placed in a way that they cannot be picked up again or items getting lost while respawning.

Beside the mentioned issues the testers feedback was quite positive. They stated their communication with their partner has worked well and the visual style of the game was very appealing. Also, most of them liked the music and agreed it was fitting with the game. Some would have liked more different sound effects and an additional music track for the menu. Concerning our characters and their abilities / perception, the testers preferred Alice over Anton.

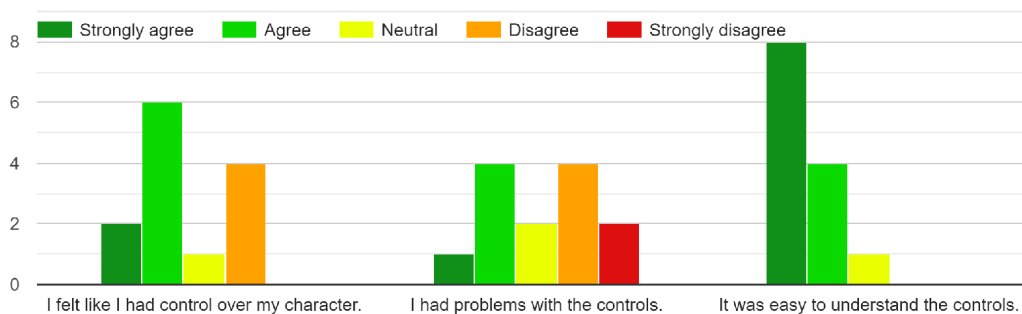
Diagramms

Did you have problems to find the next necessary task?

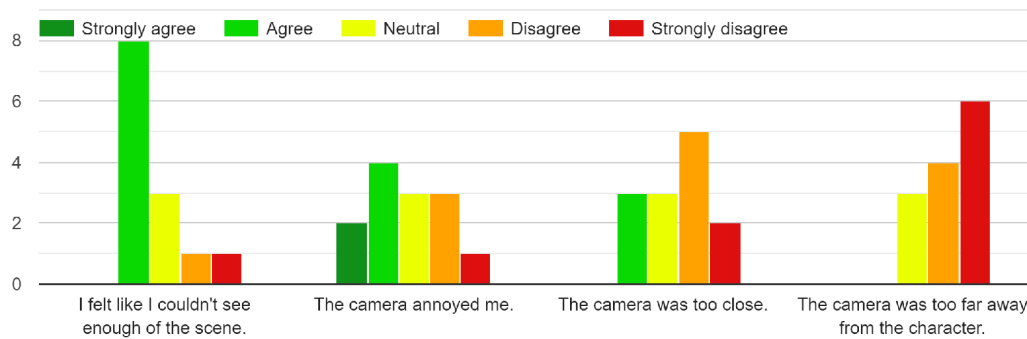
13 Antworten



Concerning the controls:

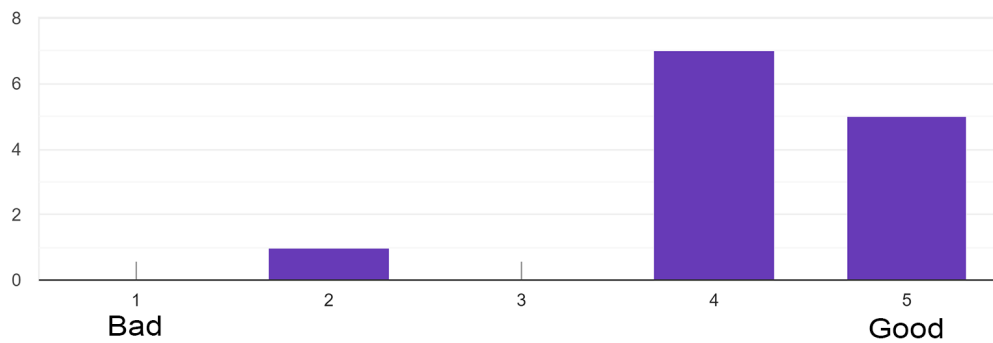


Concerning the camera:



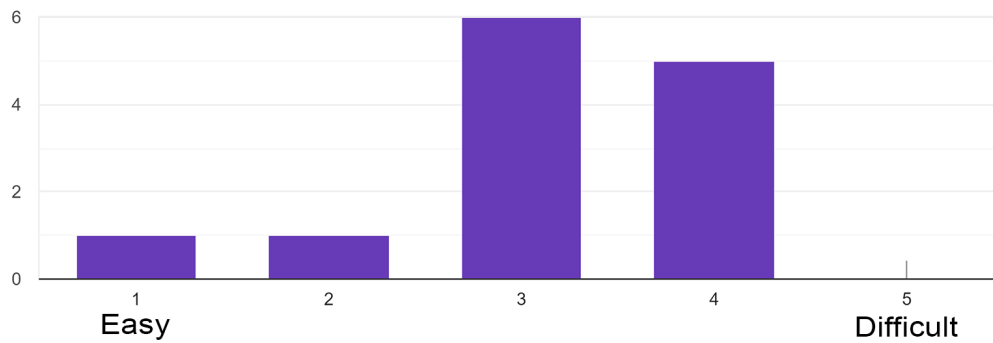
How well did the cooperation with the other player work?

13 Antworten



How easy was it to solve the puzzles?

13 Antworten



Changes

Changes & Additions

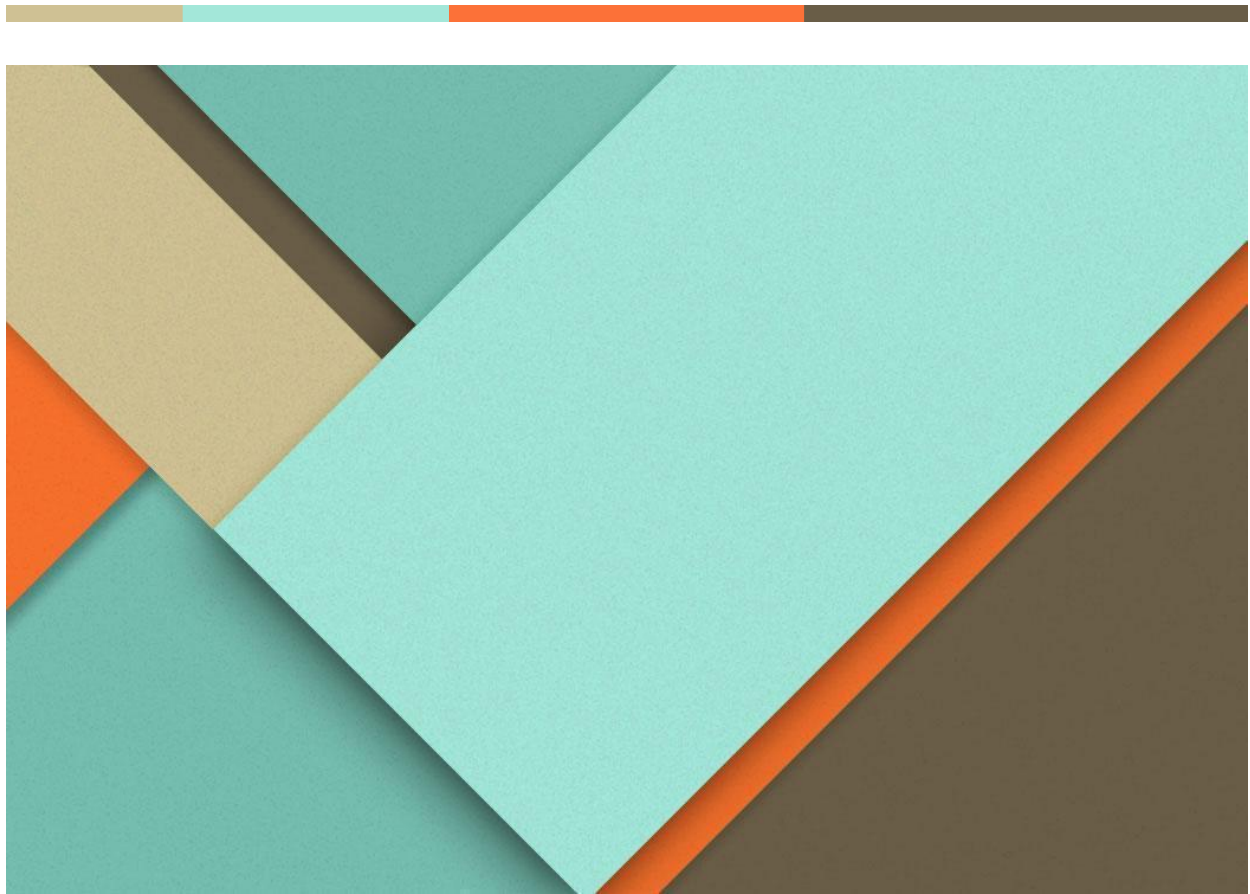
Due to problems with physics which appeared only in the built version of our game, we had to adjust our second puzzle before we started the playtesting. Originally, the male character should be able to find a big object, which could be moved through an illuminated area in order to cast a shadow inside which the female character could travel safely without being spotted by the observing teachers. However, as the physics simulation of the object did not work properly after building the game, we decided to simply replace the object with the male character himself. Now they need to sneak close to each other through the illuminated area to continue to the next room.

In the future we plan on adding more information about our characters and some narrative elements like short dialogues between the two characters. Furthermore, we will provide the players with additional hints and visual / acoustical feedback in order to guide and inform them inside the rooms. Additionally, we are working on a solution for making a player's character visible through other objects or objects transparent if they are located between character and camera.

To prevent the user from accidentally putting down items, we plan to add a dialog asking the user for a confirmation. This might also prevent a bug caused by putting down an item too close to another object which possibly makes the item inaccessible.

Moreover, we want to adjust the position of the camera and the jumping mechanic to improve the user experience. The camera will be positioned higher if the player is on the ground in order to prevent the camera from clipping through objects. For the jumping mechanic we plan to enable a slight directional velocity change while the character is in the air so the player can influence where the character is landing. Until now the user had no influence on the character movement between leaving the ground and landing.

And lastly, we are working on designing more interesting abilities for our male character Anton, because the testers described playing Anton as rather boring and they disliked the times when they had nothing to do but to wait until Alice had solved the "interesting" part of the puzzle.



Final Release:

Beyond our Sight

July 2021

Team Two*2

Maximilian Hess

Oliver Jung

Viktoria Kirchleitner

Moritz Schirra



Game Summary

Beyond our Sight is a cooperative multiplayer puzzle game, in which two players solve a level full of creative puzzles. However, both protagonists are substantially different in their abilities and how they perceive the world around them. While Anton sees the world monochromatic and orderly, chaotic Alice is surrounded by vibrant colours and disarray. In their plan to escape their everyday school life, *Beyond our Sight* lets players experience their journey and utilize the childrens' unique vision and abilities to succeed when confronted with creative and complex puzzles all throughout the school building.

Online Multiplayer allows friends to explore these two distinct visions of the same school house together. They help each other progress by investigating clues, sneaking around the observant eyes of the teachers, entering secret and creative passcodes to find new passageways and master diverse and ingenious puzzles. And through all that, communication is the key, as even though their characters might stand right next to each other, the surroundings might appear entirely different for both of them and thus also the obstacles they face. Objects clearly visible to one player might be non-existent, altered or displaced for the other. Only when communicating their problems, hints and solution approaches, Anton and Alice will be able to complete their challenging escape.

Beyond our Sight is played with keyboard and mouse on Windows and Linux PCs.

State of the Game and Evolution since Alpha Release

Menus & Gameplay

The menus experienced a big improvement since the alpha release, now sporting beautiful, thematic artwork matching the colorful buttons. The lobby-system, through which multiplayer games are started, now allows for more options, giving players the choice of playing Alice or Anton. The game starts with a short intro on the characters and the story. Presenting the setting this way will give players an incentive to progress through the level and immerse them more with their protagonist.



In response to some playtesters' feedback, we changed the camera to a wider angle but with certain, more stationary paths. This will allow a better view of the scene and helps us highlight certain objects or corners. Furthermore, objects between the protagonist and the player now become half-transparent, which is another step towards better orientation in the rooms. The jumping mechanic was also reworked, as it felt clumsy and hard to control. It is now much easier to perform more precise jumps, as is necessary e.g. in the science lecture hall, because the player can now influence the character's velocity slightly while in the air.

We also added a small ledge on the floor in all rooms where players have to move objects, to prevent deadlocks when players push chairs or similar to walls where they cannot retrieve them. Additionally, we added even more small clues and dialogue, mostly unique for each character, to avoid players being stuck in certain situations. When they reach certain areas in a room, e.g. in a wrong direction, they are still rewarded with a small piece of useful information.

A short Tour through the Level

The starting room is the elementary school classroom. Seemingly, the teacher has left for the moment and thus, Alice convinces Anton to escape the school grounds. Here the players look for a key to open the door on the right. They have to combine the clues on the board with the open book on the desk, which only Anton can read, to get a secret code out of animal icons. Mechanics like jumping on a crouched character and moving certain objects (a chair in this case) are introduced. Using either of them, Alice can reach the teacher's bag and enter the code to get the key. This classroom received a few more hints in this version, helping in getting to know the protagonists, and also heavily profited from the jump rework.



Behind the door is the hallway, where an open door, revealing a teacher's presence, prevents the players' immediate progress. Anton can sneak through however and provide Alice with cover. Sneaking behind a movable box, Alice can also get through the hallway safely. The ability to hide Alice behind the box is new in this release and replaced an older mechanic that was used during playtesting.



On the other side of the hallway is the science lecture hall. There, a clue for Alice is hinting to climb up the low-hanging lamps towards the beamer, which starts a helpful powerpoint slide. Anton is able to read it and find the clues that lead him to the giant periodic table. Searching the hinted-at elements on the table rewards the players with a colour-combination that opens a secret ventilation shaft behind the blackboard. This puzzle was clarified more, removing a few irritations that set some players on the wrong track.

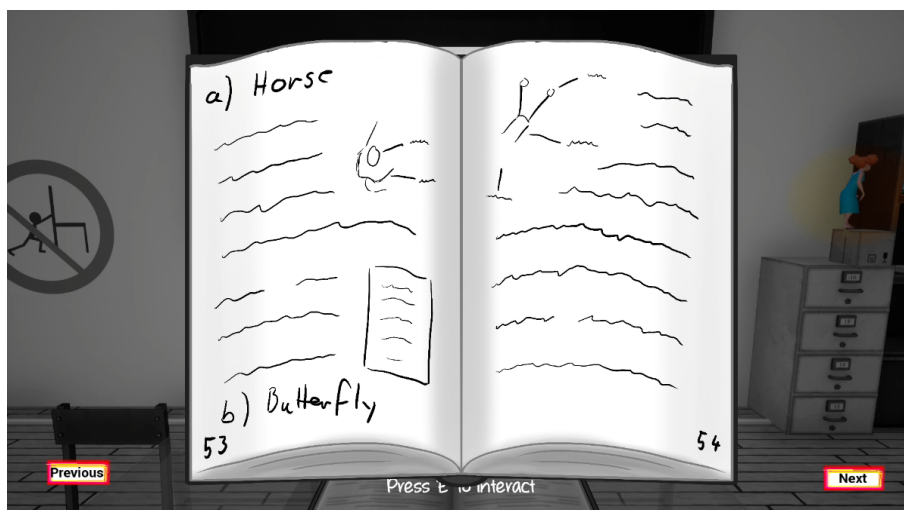


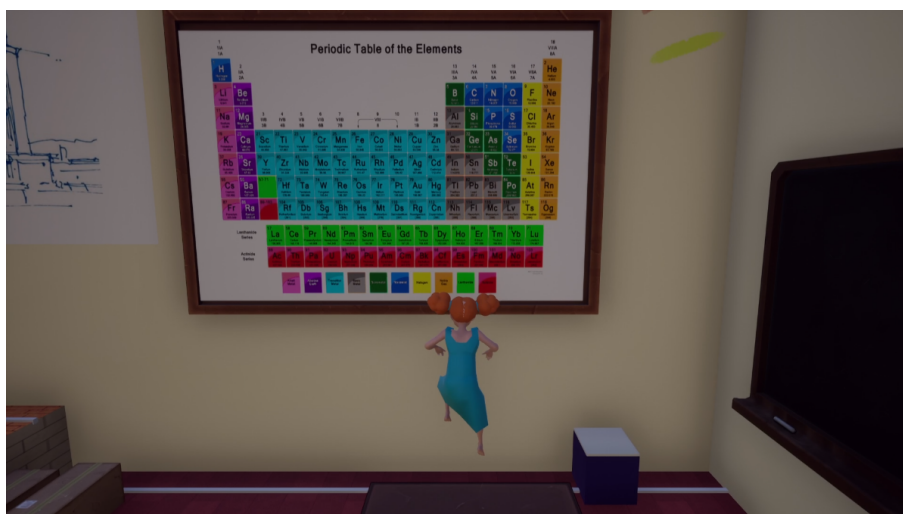
In the shaft, Alice can pass through the hole in the lattice that does not exist for Anton and break it open for him from the other side. This is possible after picking up the crowbar nearby.

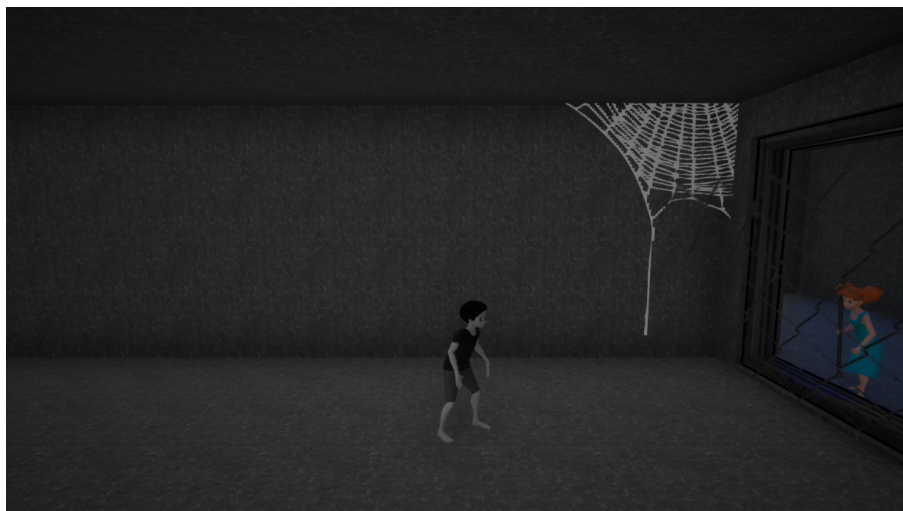
The last room is actually two adjacent classrooms. Here Anton can climb on the woodwork beneath the ceiling and pass by a camera that would spot out Alice. Meanwhile, she can enter the other room, which is locked for Anton. There she can pass on a sequence of musical notes, allowing Anton to turn on the giant globe in Alice's room. She can then break it off its mounting and smash in the door in Anton's vision. Finally, Anton is able to deactivate the camera that guards the door out of the building and they can leave together. New additions in this final part are windows between the adjacent rooms and a visible deactivated-state of the cameras. The former gives Anton-players a better idea of how Alice's room looks, making it easier for Alice-players to explain their situation. The end of the level is now more clear and a screen congratulating both players on their win is now available.



The Game in Pictures









Our Experience

We were able to convert our original game idea into a complex and fun game without any major cuts to our vision. Our gameplay and puzzles exceed our initial expectations and the implementation of the two different views for both protagonists went faster than anticipated. Even the hiding of objects in one vision, which we originally expected as challenging, was already available very early in development.

However, the multiplayer took some time to be implemented successfully and led to unforeseen problems multiple times. It remained a technical challenge even throughout the playtesting phase.

Overall, we were able to stick to our schedule and rarely deviated from it. We were able to cover every feature we had in mind for our five rooms, and even though there are still some minor flaws for which the fix did not make the deadline, we are very content with our final release. We still think the game has a lot of potential and will consider updates with additional content, such as the “extra” targets from the game idea document, for the future.


Personal Comments

1. What was the biggest technical difficulty during the project?

The multiplayer implementation proved to be tricky, especially at the start, as the replication of actions and movement in the game takes some time to get used to and always has to be kept in mind. Furthermore, because of possible delays due to mediocre or bad internet connections of some players, certain gameplay mechanics that require precise input from the client-side are hard to implement. At some points fixing such things took significantly more hours to resolve but the multiplayer is now fully functional.

2. What was your impression of working with the theme?

The theme allowed for a lot of creativity and already provided a logical point of conflict that could be utilized for the game. Many design decisions came to us naturally, just through the theme. It was also interesting to see the different interpretations of the other teams and also helped make certain design decisions seem less arbitrary when presenting them to an audience.



3. Do you think the theme enhanced your game, or would you have been happier with total freedom?

The theme helped finding a game idea that satisfied all group members. Total freedom might have led to internal conflicts or disagreements, as then the discussion about the games genre would probably be at the centre of the discussion. Through the theme, the centre of the discussion is how the theme is best implemented and expressed in a game and each teammate's genre preferences appear less important.

4. What would you do differently in your next game project?

Provide the testers with a more polished version of the game or clarify more that their version is "work in progress". This way there should be more sympathy for bugs or faulty game states.

5. What was your greatest success during the project?

The greatest feeling of success was probably the completion of the sneaking-puzzle in the hallway. The box that should be moved by Anton and hide a sneaking Alice in the process took us a long time to debug, up to the point where we cut this solution of the puzzle from the playtesting version. When it finally worked correctly in online multiplayer it was a great feeling because it meant that all puzzles could now be completed without major bugs and thus the playthrough planned for the final release was possible.

6. Are you happy with the final result of your project?

We are exceptionally happy with our game and how the different features we imagined at the start now turned out. It is also great how detailed and intricate we were able to make our level and how much creativity we could express in the project. We are also happy to share the playing-experience with more people now that it is finished.

7. Do you consider the project a success?

Definitely. We learned a lot about the Unreal Engine and project work in general. We are also excited to see even more people play our game at the demo day. And presenting at the demo day feels like a success in itself.



8. To what extent did you meet your project plan and milestones (not at all, partly, mostly, always)?

We always met our milestones but it was a close call sometimes. Even if some specific thing required more time than expected, usually something else was finished a little bit earlier and thus the workload for the week was done anyways.

9. What improvements would you suggest for the course organization?

Having an additional week of time before the playtesting would be great, because it gives the testers more time to plan and requires them to be available on a less short notice. However, if an additional week cannot be given, it should not be taken from another milestone, because they are planned rather tight anyhow.