Computer Games Lab - Riddilikus

Jakub Cichor   Angela Denninger   Martin Frank
Martin Horrer   Kevin Sawischa

WS 2017/18

Contents

1 Formal Game Proposal

1.1 Game Idea

Our game is an isometric action-adventure game with a heavy focus on cooperative gameplay. As a character with different magic abilities, the players have to traverse a dangerous planet and solve environmental puzzles by combining their spells at the right time. Treacherous environment is not the only danger though, as after certain points in time the players will have to face off against strong opponents where teamwork will be required in order to struck them down.

The game is set on a fictional planet far away from earth. According to the ship's onboard map, there seems to be a human-inhabited village not far from our players' crash site, however, in order to get to the point and possibly get off the planet, our characters have to traverse a hostile environment which tries to hinder them with complex and unknown areas. Furthermore, every time a section is completed and hope is on the horizon, unknown lifeforms that can only be described as alien creatures try to stop the players from progressing any further.

While making their way through the environment, the characters come across a multitude of different climates and possible obstacles, and luckily enough, the planet's physical properties are not that different from our known earth.

As a matter of fact, our players' are not mere human explorers. Known to common folks only as "mages" they wield the powers of four or more different elements and can control them at will. Unfortunately, they are individually not strong enough to use all four elements at the same time, which is why each character is focused on only two elements, e. g. Fire/Lightning and Water/Ice. That is not at all though, as both the environmental puzzles and our boss enemies require different elemental magic at different times in order to be progressed through. In turn, this means that the players have to use the magic at their disposal in cooperation, because this is the only way to reach their destination.

Considering the dangers which lurk on the planet, they can range from

simple, small obstacles requiring one or two spells to complex, physics-based puzzles and multi-stage bossfights. As we are talking about elemental magic, we envision situations akin to setting wooden logs on fire in order to progress through them, but also first freezing a river, after crossing it setting it on fire in order to melt it back into water and then to electrocute the chasing boss enemy, while it is in the water, with lightning magic. The possibilities for different encounters and problems-to-solve are basically endless.
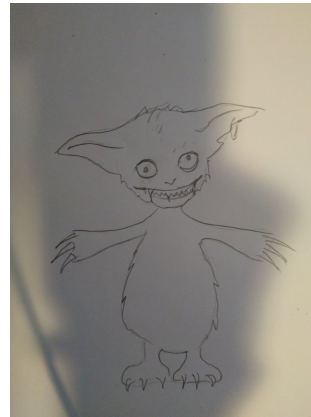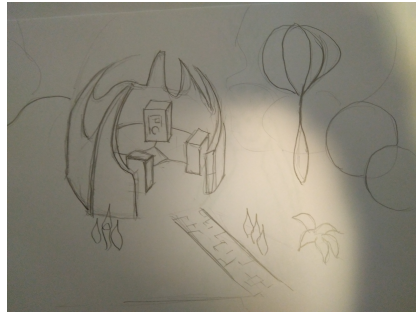
As the course's topic is "Together", this game focuses on working together by using different characters with different abilities and thereby requiring the players to work together through an cooperative online experience. Hence only one player would not have access to the entire range of magical abilities and thereby it would not be possible to progress through all puzzles and enemies. Down the line we are looking at including a cooperative split-screen mode where two players can play directly with each other, and also a more varied structure when it comes to adding questlike elements like for example escort missions.

1.2   Technical Achievement

The primary technical achievement in our game is going to be the implementation of a proper online cooperative multiplayer mode, where both players are able to play with each other and solve the game's challenges together. Moreover, the addition of properly simulated physical effects, as all of the magic in the game is based on natural elements, is going to be important as well and will therefore be our second important technical achievement. Having said that, a big focus is going to be to find the right balance between the cooperation required and also the power a single player has, as even though we are giving any single player only a subset of all possible abilities, the characters also should feel strong by themselves. After all, these are powerful mages.

1.3 Big Idea Bullseye

Whenever a challenge is encountered in the game, be it an environmental obstacle or an enemy boss, the only way to beat it is to work together with a second player and to use the combined power of both characters' magic in order to overcome the problem. Without cooperation and teamwork it is impossible to succeed in this game.

1.4 Assessment

Overall, we are creating a game which is supposed to be enjoyable, compelling and focus strongly on cooperative elements. The theme "together" is the primary focus, as we are designing gameplay around the idea of teamwork, but the players also should experience the feeling of overcoming big, strong and dangerous enemies together, while primarily focusing on solving varied environmental puzzles. When a boss enemy is faced, through combining their efforts by for example one player splashing the enemy with a water spell and then the second player using a lightning spell to increase effectiveness, we allow our players to feel powerful with the abilities they have. With this in mind we also allow them a sense of accomplishment by solving the problem together.

Finally, we are hoping to appeal to a crowd of people who love Diablo or Magicka, but always felt that these games were lacking more in depth teamwork elements besides your typical Tank/Damage/Healer archetypes. In addition, we are throwing in environmental interactions and puzzles for good measure.

1.5   Detailed Task Breakdown

Functional Minimum	Low Target	Desirable Target	High Target	Extras
UI				
Basic UI	Improved Hud Skill Bars for elements game notifications	UI Theme Alerts	Animated UI	Cutomizable skill bar
Character Modeling & Animations				
Dummy Models for Player and Environment	Enemy Dummy Models Basic Animations	Beautiful Models for Player, Enemy and Environment	Extensive Animations	Animated Dialogues Hair animations Aging of characters
Environment				
Basic interactions with world	More interactions with puzzle objects, effects on environment	More types of objects with influence on environment, more puzzles	Environment acts on itself --> Climate effects objects / elements / players, nature catastrophes	Survival elements like fatigue, hunger
Player interactions and Elements				
Basic player movement and interaction with environment Usage of elements Fire and Ice	Higher Degree of interaction with environment	More Elements (like stone and wind)	Combination of elements to create new elements	Exchanging of elements at checkpoints
Networking				
1 Player with character switch	2 Players in LAN	4 Players in LAN	Online support	Splitscreen support
Levels				
Test-Level	First Level static level boss enemy	Level adjusted to players in difficulty	Multiple different Levels	Randomly generated level

1.6 Development Schedule

Vorgang	Anf.	Ende
Game Idea Pitch		03.11.17
Brainstorming	25.	29.10.17
Write Text	30.	03.11.17
Prototype	06.	14.11.17
Brainstorming	06.	09.11.17
Building Prototype	08.	12.11.17
Testing Prototype	10.	14.11.17
Interim Demo	15.	05.12.17
Basic UI	15.	22.11.17
Basic Playermove	15.	22.11.17
2 Elements	22.	05.12.17
Basic Interaction	15.	29.11.17
Beginnings of Multi.	15.	29.11.17
Beginnings of Multi.	15.	05.12.17
Dummy Models to...	15.	05.12.17
Test Level	29.	05.12.17
Alpha Release		09.01.18
Stylized UI	06.	17.12.17
Sounds	18.	31.12.17
More uses for ele...	06.	17.12.17
More Elements	18.	31.12.17
Beautiful Models	06.	17.12.17
Animation	11.	08.01.18
Coop on one mon...	11.	31.12.17
Three Levels	18.	09.01.18
Testing	25.	09.01.18
Playtesting	10.	17.01.18
Testing	10.	17.01.18
Analyze Results	13.	20.01.18
Write Text	18.	21.01.18
Final Release		06.02.18
Fixing Bugs	25.	06.02.18
Adding High Targets	29.	02.02.18

2 Game Prototype

2.1 Changes according to feedback

Based on the feedback that we have received in the last week, we have included a number of different changes to our game.

First and foremost, we decided that we are going to scrap the idea of including a singleplayer mode. Instead, we would like to focus on an interesting, well-paced and compelling cooperative experience for two players. This is going to allow us to balance the game properly around this mode and design the puzzles so that they will be balanced specifically for two players. We are thinking about adding in a four player mode as a high-target or extra, but before that, the goal is to create a two player experience.

Additionally, we have received a substantial amount of feedback regarding the core gameplay of our game. After reading through the suggestions by other people, we have decided to make the puzzle aspect of our game the primary focus, while reducing the importance of our proposed boss fights. We want to have a set number of puzzles in different environments that the players have to solve first before the game ends in one boss battle. This final fight will be composed of multiple stages which will be more like additional puzzles instead of an actual combat system one might know from ARPG games.

Also, we have received feedback that the exploration aspect seems very promising. For this matter we decided that it is the player's task to figure out most of the environment interaction whether with or without the elements by himself. Meaning not doing lots of tutorials or notifications for new scenarios but let the player find out about his possibilities. Finally, it is proposed to integrate humor into the game. We take this into consideration and will think of scenarios where it is applicable to the story and gameplay.

When it comes to the narrative background and setting of our game, we have fleshed it out a bit further. The idea is that our players are not normal mages, but instead they get their magic by injecting a type of elemental drug in their bodies, however, because of its toxicity, only one element can be used at any given point. Their goal is to go to specifically this dangerous planet where the raw ingredient of the elemental drug is coming from as they have received information that another ship has crashed there and it is their mission to rescue the survivors. Now it is the goal of our main characters to find the missing crew and find out what happened exactly.

By making their way through the planet, the players find out more details about the incidents that happened before their arrival. Around the game's third level, they find the surviving crew. During this encounter they obtain the ability to add one additional element to their arsenal each, which in turn allows for more complex puzzles that are going to require even more teamwork. The game's finale will be composed of, as mentioned before, a final, multistage boss battle. Our characters are going to have to use the skills and their understanding of the environment, which they have acquired during the course of the game, to beat the final boss and thereby lead the surviving crew to safety.

2.2 Puzzle Prototype

In order to test out our game idea and boil it down to its most important core features, we have created two paper prototypes. We used them to recreate two specific levels where the players have to solve a puzzle and one additional version to simulate the final boss. In both versions we have created a basic field, which is divided like a chess board, and both versions work in a turn-based manner.
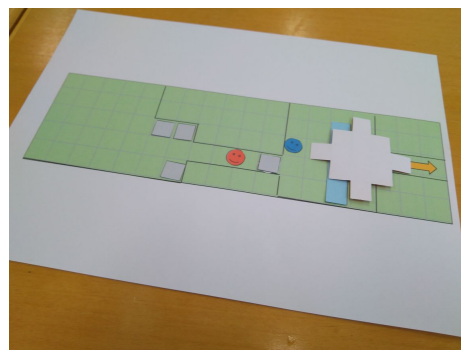

Feuer:
- 1 Schaden Zielobjekt + 1 Schaden auf Umkreis
- Holzobjekte fangen Feuer (alle 1 Runden 1 Schaden)
- Kleine Feuerkugeln erschaffen (werfbar)

Eis:
- 1 Schaden Zielobjekt + 1 Schaden auf Umkreis
- Objekte sind für 5 Runden eingefroren
- Kleine Eiskugel erschaffen (stellbar, werfbar)
- Feuer ausmachen

Player used ice to freeze the river

For the puzzle prototype, both players can move independently from each other, and each character is supposed to represent one element. They can use

their elemental magic at their own discretion, but they also have the ability to interact with objects on a more basic level, like pushing a box or activating a pressure plate. With these skills, the players have to figure out a way to traverse the environment, like how they are supposed to cross a hole or a river, without making a mistake and falling to their deaths. A big part of the gameplay experience is to figure out, by trying, how certain world objects interact with the individual elements.
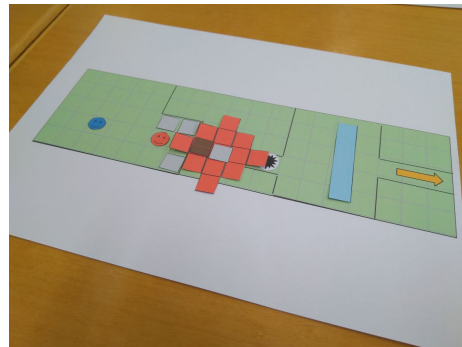
Player used fire to destroy wooden boxes

The core gameplay in our prototype seemed fun while trying it out together. It was simple and fairly intuitive, but also interesting to figure out how to interact with the environment and to make mistakes while trying things out. This is something that we were hoping for with our initial game idea, so this experience left us with a positive outlook on our core gameplay loop. While the initial puzzle ideas were rather simplistic, we believe that more complexity and additional elements will only make it better.

Creating the prototype was not that difficult, as we opted for a simple prototype with paper backgrounds and figurines. However, the actual minutiae when it comes to gameplay rules and interactions had to be iterated a couple of times to get it right. Problems like deciding whether the spell only works on a single object or on an entire area had to be fine tuned to ensure an intuitive grasp of the interactions.

After playing multiple rounds of the puzzle prototype, we have figured out that the best experience would most likely, as our aforementioned feedback stated, occur in a two player cooperative game. The reason for this is that we want the players, according to the course's topic "Together", to cooperate and solve problems with each other, but also to feel powerful. Here we gave the players only a very limited amount of abilities, which made the interactions feel too limited and one dimensional. With four players, each player would still feel relatively weak by themselves, while only a single player would not really cooperate with anyone. Finally, we figured out that adding check points would be a good idea, as this allows us to go for bolder designs of the levels where the players can actually fall into traps, making the experience of puzzle solving

slightly more tense, but not too punishing.

2.3 Boss Prototype

Having described this experience, let us talk about the boss prototype. This one has been designed initially with the idea in mind that four players might be playing the game. As the puzzle prototype has shown us that we should focus on only two players, we took this prototype as a more symbolic representation of elements and weaknesses. Specifically, each coloured pawn is supposed to be an element, while the stones represent a weakness of our boss enemy. Each of our two players controls two pawns at the same time, and one person has to control the boss.
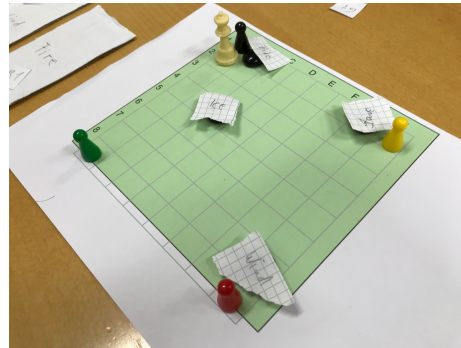
Stones are weaknesses, pawns are players' elements

The boss has to roll a dice every round which decides how many steps he is allowed to move. The pawns can move in any horizontal and vertical direction and each pawn has a specific ability: Wind can allow one player to move diagonally, fire attacks the weakness or the boss from a distance, ice can slow the boss and stone can protect one pawn in one round. The goal is to destroy all weaknesses first and then the boss himself, before the boss is able to destroy all pawns by walking over them.
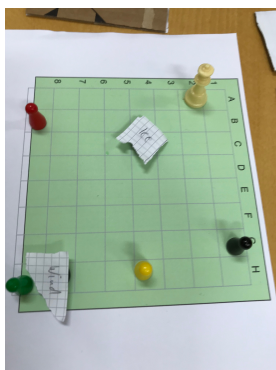
State after the players eliminated two weaknesses

Playing this prototype was a fun experience, however, it took us some time to get it right and fully comprehend all the rules. After getting this right though, we were able to play through multiple scenarios, see how they play out and adjust the rule set.At first, the boss was overpowered, as it was basically impossible for the players to bring him down, but once we allowed the players to use their abilities from a distance and also discarded the rule that every round one stone reappears if not all stones are eliminated at the same time, the balance seemed just right.

This version was very straightforward to create, as we used elements of other games like chess to represent the individual objects and characters. The primary difficulty was to figure out the rules and to adjust them over multiple playthroughs, as some abilities seemed either too strong or redundant in our first tries. After carefully adjusting multiple paramters in the gameplay, we came to the conclusion that it would in fact be better to treat the boss as a multi-staged, one-off battle, so that we could focus on it being a lasting and very challenging experience. It also showed us that the balancing of the battle is going to be a difficult task, because having so many different factors influencing the challenges proved quite demanding from a balancing standpoint.

3 Interim Report

3.1 Progress

Up until this point, we were able to finish what we considered as our functional minimum. This primarily consists of having the basics of our first level built, so that it can be completed in its simple state and so that the first puzzle can be solved.

As a reminder: The first level is the one we have shown as our puzzle prototype, where the players first need to push some rocks out of their way. Once this is accomplished, a tree has to be removed by using a fire spell, allowing the character to move forward. Then they see a hole with a rock in front of it, which means that they have to push the rock into the hole so that it becomes possible to cross. Afterwards, they encounter the obstacle of a river, and the only way to solve this part is to use an ice spell on the river, freezing the water and making it possible to walk across. This is the puzzle we have implemented until now, as it was part of our functional minimum.

Starting area

3.2 User Interface and Networking

The User Interface so far is very simple and without many functions, as this is going to become more important over time once we have more different abilities and more environment interactions. We have a skill bar on the screen that is going to be used down the line to show which skills are available and which ones are active. Then in the bottom right corner one can see a dummy healthbar, which is not used up until this point because there is no way for our player to take damage. But once the boss fight will be implemented in the future, or if

two players play together and hit each other with their spells, we will have to deal with the hitpoint system and add functionality to the healthbar.

Networking so far has been implemented in a very basic form, where the initial implementation of a LAN network exist so that hopefully, in the future, players will be able to play together via LAN.

3.3 Character

Currently we are using a simple dummy model as our character. The character can be moved around by the player by clicking the environment, for which it uses simple pathfinding as a NavMeshAgent. This makes it possible to avoid environmental obstacles. While walking around the character can push away the rocks, so that the player can progress through the level. Furthermore, by clicking the mouse buttons, it is possible to shoot a fireball and also an iceball, both of which interact with the environment in simple ways. So far, the iceball can be used in order to freeze the river. This then allows the character to move over the frozen water so that the level can be finished. In addition, the fireball can then be used to melt the frozen river. The player is also able to switch between the two different abilities by pressing the Q or W key on the keyboard.

Clearing obstacles with fire

3.4 Environment

When it comes to the environment, we have good number of different dummy models like different rocks, mountains and the river. These are supposed to roughly represent the environment we had envisioned when we created our puzzle prototype, and in the state so far it looks good, but it is going to require more detail over time. Specifically once the environmental interactions increase

in their possibilities, having different parts of the world act as aspects to solving various puzzles is going to be important.

We will also have to work out how the environment is supposed to look like exactly, as the camera that we are using now is very similar to games like Diablo, where it is showing the game world from an isometric perspective. The camera is also strictly bound to the character, which was a decision we made because we did not want the players to be able to simply move the camera around, like it is commonly the case in RTS games. We want our players to have the feeling of exploration, where they have to actually move the character into dangerous situations and deal with whatever might happen, instead of allowing them to scout out every possible danger from afar.

Using the environment to create paths

3.5   Design Revisions

Design changes since our initial game idea and prototype were rather small. For example, our player can now move in all different directions, whereas we used a grid-type movement in our prototype. So we basically took the puzzle prototype that we have created and implemented it in a way where we give the player slightly more freedom in movement and in using abilities compared to the initial design.

3.6   Implementation Challenges

The implementation went basically as expected, for example the addition of different abilities was fairly simple and was done in a short amount of time. However, some elements have proven to be slightly more complicated, like the proper combination of different puzzle elements so that they work smoothly together. One challenge we faced was in the context of NavMeshes. Even

15

though NavMeshes are incredibly useful for pathfinding and general navigation, we realized during the implementation process that when it comes to actually interacting with objects that are part of these NavMeshes, it was more challenging than expected. Notably, having static obstacles like a hole in the ground that then changes to being a walkable object proved to be a tricky problem to solve.
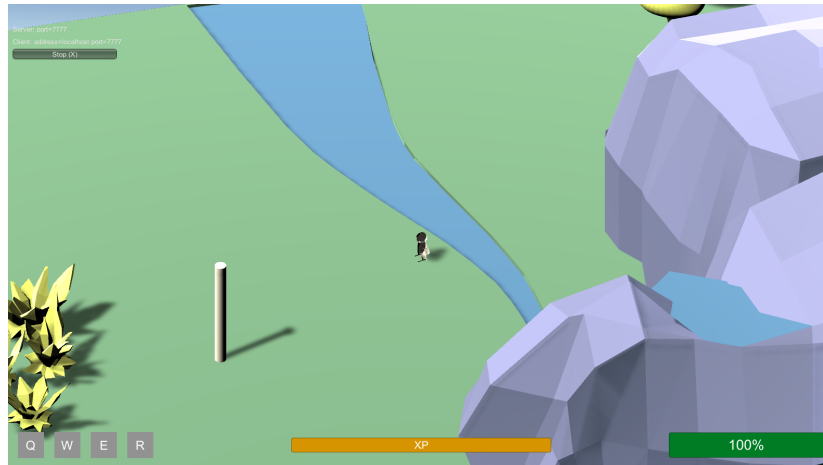
Using ice to cross the river

3.7 Next Steps

We are now at the point where every aspect of our functional minimum is done. Hence, the following steps will be entirely focused on making meaningful progress towards our desirable target while finishing the low target's final aspects. Certain elements of our low target are done already, such as the first level and some of the environmental interactions. First and foremost, networking is going to be expanded upon to start making cooperative gameplay a more significant part, which is the primary goal of this game, as the puzzles and our boss fight are expected to only be possible through smart cooperation between players. Moreover, a better looking character, a more useful HUD, more levels with increasingly interesting puzzles and the boss fight are things that absolutely need to be incorporated into the game in order to make it work.