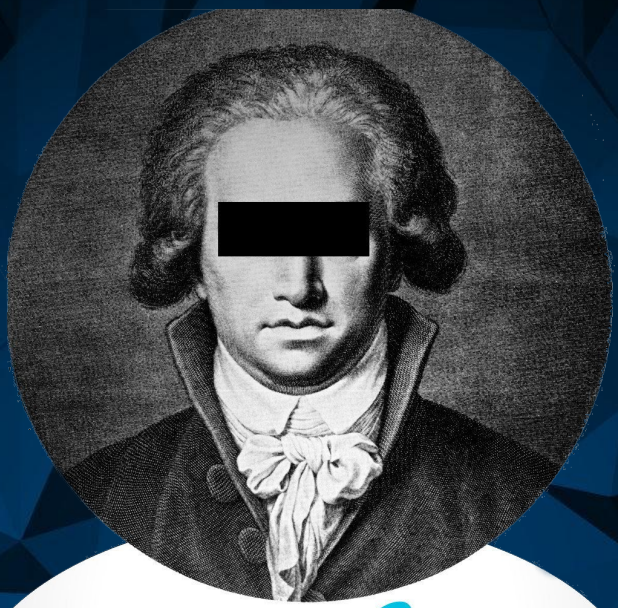

Goethe was here

THE Augmented Reality Walk-and-Click Adventure

“You have to see more, so that you can know!”™

inspired by Johann Wolfgang von Goethe’s quotation:
“You only see what you know.”
Original: “Man sieht nur, was man weiß.”

Written by

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Version # 1.00

/SchrankGames

@SchrankGames

Table of Contents

1. Game Overview

1.1 Common Questions

1.1.1 What is the game?

This game is an Augmented Reality Point and Click Adventure, in which the player is walking around special locations within the campus of TU Ilmenau. The goal is to find Goethe, who got lost during a night of drinking. During the course of the game, the player has to impress the scientists Humboldt, Kirchhoff, Helmholtz and Zuse by completing different minigames. In addition, the player has to find and collect four items which he needs while talking to Goethe in the end.

1.1.2 Why create this game?

It's sunny outside and you're bored of playing this one soccer game you are always playing? Then step outside and start your adventure! Why not putting gaming and Ilmenau itself together in one game? With this game every citizen of Ilmenau has the chance explore the university campus by playing. This is a special opportunity for people who are new to Ilmenau to learn something about the town. But also, people who are already living or studying here for a few years will be able to explore their environment with new "eyes" - namely through their portable devices. We love puzzle games and we love playing outside - so let's find Goethe.

1.1.3 Where does the game take place?

The game takes place at the Hans-Stamm-Campus of TU Ilmenau.

1.1.4 What is the main focus?

The main focus is to have a completely new (TU) Ilmenau experience. Who are Humboldt, Kirchhoff, Helmholtz and Zuse and which funny anecdotes about their study time will they tell you? And - probably the most important question - can you beat one of them in Beerpong or feed the pet spider of one of the scientists?
After playing this game, you will rethink your opinion about Ilmenau and its history – and you will most definitely not forget these adventures!

2. Story

2.1 Complete story

Ilmenau's most famous writer and figurehead, Johann Wolfgang von Goethe, has disappeared after a long night in one of Ilmenau's student clubs. As he is of a significant importance for the city, it's the player's quest to to find him. Therefore, the player has to ask Goethe's four best friends for help, namely Alexander von Humboldt, Gustav Robert Kirchhoff, Hermann von Helmholtz and Konrad Zuse (for more details see chapter 6.).
The scientists won't help the player, unless he proves he is trustworthy and clever. Thus, he must earn their respect and friendship by solving their riddles and collecting Goethe's personal belongings. The player will find each of the scientists at one special escape and rescue plan in the buildings named after them.

2.1.1 The Introduction

Since the player has started the game, he will see some pictures with a rhymed description (see picture 1). While clicking through these pictures, the player will listen to the composed soundtrack of Goethes "Erlkönig" interpreted musically by Franz Schubert. This underlines the drama of the situation.

Figure 1: The Introduction Scene

Those eight pictures tell the player what has happened the night Goethe disappeared. The player will also hear the scream of Goethe's servant, as she finds out that the next morning his bed is empty - and there's a red spot on his sheet.

2.1.2 1st Chapter

After the Introduction Scene in which the player gets to know that Goethe has vanished without a trace, the narrator will tell the player to walk to the Humboldt-building on the Hans-Stamm-Campus to talk to Alexander von Humboldt. This will be the player's first chapter. After arriving in the basement of the Humboldt-building, the player has to scan the escape and rescue plan which the narrator leads him to (see picture 2).

Figure 2: 1st chapter - Humboldt appears on the screen

Then, suddenly, Humboldt appears on the screen and moves around while he stands on a cloud. Now the player has the chance to start a dialogue with him (for more details see 2.3 Dialogues). Within this dialogue, Humboldt wants the player to solve a quest. The first of overall four quests is to feed Humboldt's pet which he brought from a South America journey. If the player succeeds, Humboldt will confess to him that he has no clue where Goethe is but he thinks Gustav Robert Kirchhoff probably knows something. But that's not it. Afterwards Humboldt tells the unknown hero that he has to watch out for a special object to scan, because the player should take care of Goethe's item which he had left there. Then the inventory box appears on the screen and the player will have to look for the item to finish the first chapter.

2.1.3 2nd Chapter

While walking to the Kirchhoff-building the player will have the chance to check his destination by tapping on the screen in case he has forgotten where to go next. After arriving at the scheduled escape and rescue plan, the player will also see Kirchhoff appearing on the screen just like Humboldt did. But Kirchhoff has different moves than Humboldt and a different outer appearance (for more details see 6. Game Characters). Within the dialogue (for more details see 2.3 Dialogues), Kirchhoff wants the player to solve his quest which is about Kirchhoff's latest invention - moveable electrons. The player has to steer one of the electrons through the hallways of the building to light up

the floors. If he succeeds, Kirchhoff will confess to him that he has no clue where Goethe is but Hermann von Helmholtz probably knows something. But just as in the first Chapter - that's not all. Gustav Robert Kirchhoff will also tell the player to watch out for another item of Goethe. After the conversation has ended, just like in the first chapter, the inventory box pops out on the screen letting the player know, that he has to find something. If he succeeds, he has to make his way into the Helmholtz-building.

2.1.4 3rd Chapter

After finding the right escape and rescue plan, the player will see Hermann von Helmholtz appearing on the screen in the same way as Humboldt and Kirchhoff did. This time Helmholtz almost forgets to put the player in a task (for more details see 2.3 Dialogues), but as our hero is an upstanding and honest person he reminds Helmholtz of his opportunity to test us. As Helmholtz is still in a good mood, he wants to play a little beer pong against our hero (see picture 3).

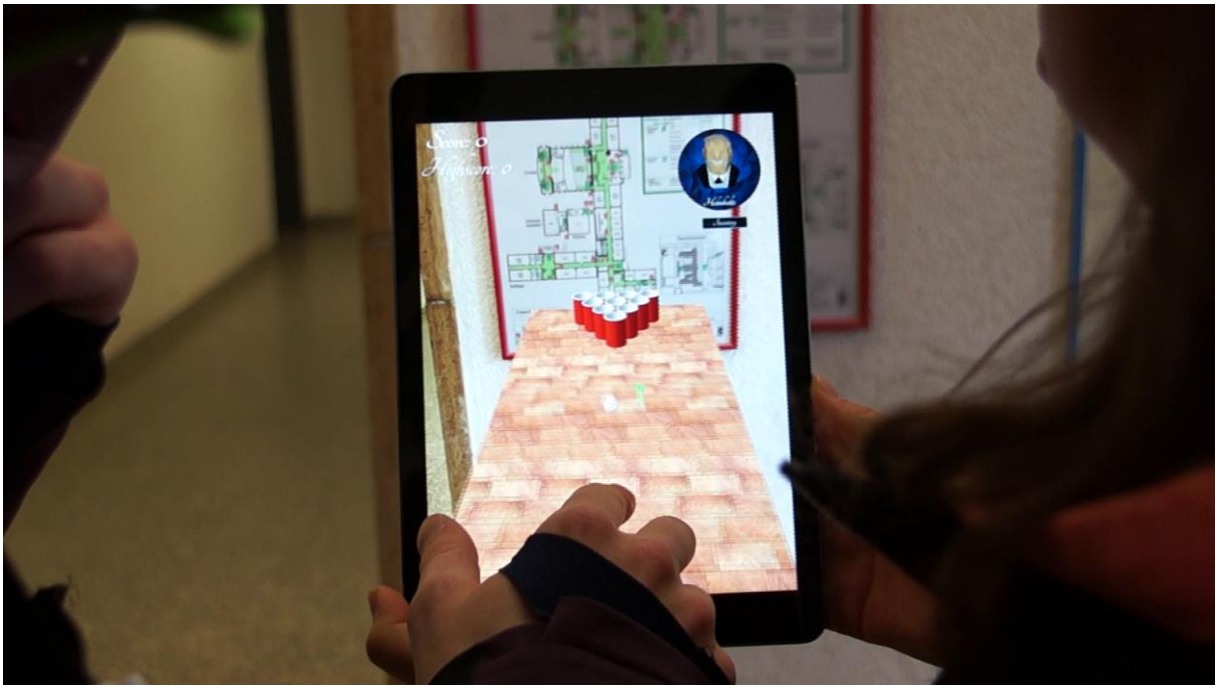

Figure 3: 3rd chapter - playing beer pong against Helmholtz

If the player succeeds, Helmholtz will confess to him that he has no clue where Goethe is but as Konrad Zuse was the last one who saw Goethe, Helmholtz is pretty sure that he probably knows something. So before saying 'Goodbye', Helmholtz makes sure that the player does not forget to take the item Goethe left in the Helmholtz building. This is why the inventory box pops up again so that the player can look for the penultimate collectable.

2.1.5 4th Chapter

Similar to the other chapters, the player will find Konrad Zuse at the escape and rescue plan to which - this time - the give information of Helmholtz leads him. Therefore, the player has to scan the plan so that he can get in touch with Zuse. In the course of the conversation (for more details see 2.3 Dialogues), Zuse puts the player to a task: he has to

rescue Konrad's latest version of his computer Zuse (Z26) because it is standing on a desk in a room which is getting full of water (cheers to the typical weather of Ilmenau). This is why the player has to open the door by converting decimal into binary numbers so that the water drains out of the room and the computer stays fine. If he succeeds, Zuse will tell him that he talked to Goethe before they left the student club and that Goethe told him that he wanted to go somewhere quiet so that he can think about stuff. As Zuse got an item from Goethe, he tells the player where to look for as it might be important to bring back Goethe.

2.1.6 Final Chapter

After the player has figured out where to go, he will find Goethe at the first escape and rescue plan in the specific building. So, if the scanning fails the player knows that he's in the wrong building (SPOILER ALERT: the correct building is the university library also known as Leibnizbau). If he has no clue, he will get a hint by tapping the hint button on the screen. As he finds Goethe, he will see that Goethe is disappointed. By talking to him (for more details see 2.3 Dialogues) the player will know why he is sad and why he has turned his back to his daily life. But as the player has collected all his personal belongings and knows what they mean to him, Goethe is feeling better because he realizes that the people have not forgotten him after all. Finally in the end - Goethe gives Ilmenau a second chance and will come back.

2.2 Background Story

Actually, everything is almost the same as usual: the five friends are having a good time in one of Ilmenau's student clubs. But this time, something is different. Goethe seems to be a bit thoughtful and quiet. He thinks that people have forgotten him and no one remembers even one of his works. Unfortunately, no friend of him notices his emotional period. So as the night moves on, all of them go separate ways. As Zuse is the youngest and Goethe the most experienced of the five, they both are the last two to say goodbye. Only this time, Goethe is telling Zuse how he's feeling. But as Zuse has lost the sight of the big picture because it was so late, he does not receive Gothes cry for help. So Goethe decides to take a big walk instead of going home and getting back into his daily routine. This is how he gets lost and the player's journey begins.

The story takes place in Ilmenau and - in terms of time - in the here and now. Because of their degree of awareness and their enormous importance for science and research, the four scientists Humboldt, Kirchhoff, Helmholtz and Zuse are friends with Goethe. There are three reasons why these special characters have been chosen:

1. Each of the scientists gives a building on the Hans-Stamm-Campus its name,
2. The distances to be covered between the buildings are more than acceptable and
3. Except Konrad Zuse, all of the other three scientists as well as Johann Wolfgang von Goethe lived around the 19th century (for more details see 6. Game Characters). This is why, as a fictional scenario, Zuse time travelled with his freshly invented time machine because he wanted to have like-minded friends around.

By playing 'Goethe was here' the player will get to know some of the main facts about the scientists as well as Goethe. Furthermore, he will explore the campus and its lifestyle. One of the game's main goals is, that after finishing the game the player knows why the buildings at the Hans-Stamm-Campus have the honor to carry the names of the scientists and to be inspired by their hunger for knowledge.

2.3 Dialogues

Explanation:
The green coloured sentences are leading to the scientist's quest and therefore it's the only way to end the conversation plus to get to the main quest: finding Goethe.
The black coloured sentences should allow the player to ask different questions and pepper the dialogues with humour plus they are nice to have.
The red coloured sentences will appear after the player didn't finish the quest or he decides to leave the conversation.
The tables will always show the scientist in the left column and the player in the right one. Between those two stands a column which defines a Question Block for each pair of questions, so that it becomes clear what happens after the scientist gave the answer.

Chapter 1 – Alexander von Humboldt

Humboldt (Hu)	Question Block	Player (P)
Hu1: Hi Kid! What's the matter? -> QB1	QB1	P1a (Hu1): Mr Humboldt! You have to help me! Wolfgang has disappeared after drinking last night. Do ya kno da wae? -> QB2: Hu2a P1b (Hu1): Hi Humbi, what was it like to live in the 19th century? -> QB2: Hu2b P1c (Hu1): Alexander - what make's you so special? -> QB2: Hu2c P1d (Hu1): Sorry, I forgot my question. -> QB2: Hu2d
Hu2a (P1a): Oh my Goethe - I mean gosh - hm let me think - well - I dont know where he is, however I know who could probably know it… but before telling you, I'd like to put you in a task. -> QB2 Hu2b (P1b): Well what is it like to live in Ilmenau in the 21st century? You see? I think we are not that different. -> QB1 Hu2c (P1c): Well - I worked as a scientist and a politician plus I explored tons of different things and wrote books	QB2	P2a (Hu2a): Alright fine. What would you like me to do? -> QB3: Hu3a P2b (Hu2b): A Task? Hmm... I guess I'll try to find out by myself.. -> QB3: Hu3b

about it. Some people call me the 2nd Columbus or the new Aristoteles. Some even name trains after me... so I guess I did some good stuff while I lived. -> QB1 Hu2d (P1d): No worries, pal. I can't run away because of my Augmented Reality-Being - so when you remember it, I'll still be standing here. -> Break / QB1		
Hu3a (P2a): Great. First of all you have to feed my pet. I caught Raffael in the middle of the rainforest. He had a rough life. That's why I took him with me. After you're finished with that, come back to me for the last quest. -> QB3: P3 Hu3b (P2b): I understand you. 36% of my life I travelled land and sea to find out all by myself in what kind of world we live… and today there's Wikipedia - damn it. -> Break / Qb1	QB3	P3 (Hu3a): Alright! See you soon, sailor moon! *Playing*
<<<<<<<<<<<<<<<<<<<<<<<<<<<< PLAYING >>>>>>>>>>>>>>>>>>>>>>>>>>>>		
Hu4: I see! You didn't fail. Raffael looks very happy. Thank you! So, as I already mentioned, I do not really have a clue where Wolfgang is, but the last time I saw him, he was with G. R. Kirchhoff. So, you should probably visit him and ask if he knows where Goethe is hanging. You'll find him in the Kirchhoff Building at the rescue plan next to room K2013. And before you leave, please walk through the Humboldt-Bau - perfect name for a building by the way. Watch out for a 6x5 Matrix. You can't miss that. Then have a closer look at element (6, 1) - scan it and you'll find an item which meant something for Wolfgang... take it with you - maybe it's useful to find him. -> QB4	QB4	P4 (Hu4): Okay thank you Humboldt! it was an honor to meet you! *Next Chapter*

Chapter 2 – Kirchhoff – Gustav Robert Kirchhoff

Kirchhoff (K)	Question Block	Player (P)
K1: Grüß Gott, adventurer! -> QB1	QB1	P1a (K1): Hello Gustav Robert Kirchhoff! Humboldt is sending me to you! Goethe is lost and nobody knows where he is! You have to help me! -> QB2: K2a P1b (K1): Mr. Kirchhoff! Nice to meet you! What are you doing here? -> QB2: K2b P1c (K1): Gustav! Nice beard that you have there! -> QB2: K2c

K2a (P1a) Alright, sure! But first of all... I mean... in the middle, you have to solve a little riddle. As you maybe know, I have a fable for physics and electricity. That's why I came up with this new idea of electrical roads which can be driven by a so called electric charge vehicle. Please show me that you're willing to find our lost friend and test my racing circuit.... => QB2: P2a K2b (P1b): Well somebody has to take care of the electricity or do you believe in technique and stuff like that? Of course magic is the reason that complex stuff is working and besides that I'm taking care of the electrons so that they race on the right path. -> QB2: P2b K2c(P1c): Thank you, kid! For the last few years I'm seeing more and more people walking around like that. I guess I'm a kind of a trendsetter. -> QB2: P2c	QB2	P2a(K2a): Okay! Thank you Mr. Kirchhoff! I'll be back in a bit. -> QB3: K3a P2b (K2b): Amazing! This information is mindblowing! -> QB3: K3b P2c (K2c): Can you tell me your secret? -> QB3: K3c
K3a (P2a): Bis baldi, Vivaldi! K3b (P2b): Sure it is! I mean, I'm Kirchhoff, founder of – oh what a surprise - Kirchhoff's Circuit Laws. My buddy R.W. Bunsen and I found the elements Caesium and Rubidium in 1861. You can always count on me, cause I studied math and teached physics. -> QB1 K3c (P2c): I'd love to, but I don't know you. Maybe you can show me that you're worthy to receive my advice and then ask me again. -> QB1	QB3	*Playing*
<<<<<<<<<<<<<<<<<<<<<<<<<<<<< PLAYING >>>>>>>>>>>>>>>>>>>>>>>>>>>>>		
K4a: You made it! That's great! Well, I don't know exactly where Goethe is, but I guess you should walk to Helmholtz and ask him. He's some kind of magnet for information like these. To find him, you have to enter the Helmholtz building towards the main entrance and on the right you'll find the escape and rescue plan. Scan it and talk to Hermann. But before you go ahead, take a closer look at the escape and rescue plan in the basement of the building named after me. Goethe used to hide some of his personal stuff down there. You'll probably need one of his items to find him. But who am I to give you good advice. I just came up with an idea about the relation between U, R and I. Not that important for today's life, right? ->QB4	QB4	P4a (K4a): Then I'll go. Bye! -> QB5: K5a P4b (K4a): What's the secret now? -> QB5: K5b P4c (K4b): Alright, I will try that. *Playing*

K4b: Try faster, harder – Scooter. Then I'll help you! -> QB4: P4c		
K5a (P4a): Alright, have a nice ride! K5b (P4b): You get your beard so fluffy and long by singing songs from the birds, drinking beer and... - oh sorry, I have to leave.	QB5	*Next Chapter*

Chapter 3 – Hermann Ludwig Ferdinand von Helmholtz

Helmholtz (He)	Question Block	Player (P)
He1: Hi, adventurer! It's me, your "Reichskanzler of Physics" - Helm to the Holtz. What can I do for you? -> QB1	QB1	P1a (He1): Hello, Mr. Helmholtz! Goethe is lost! You have to help me! Do you know where he is? -> QB2: He2a P1b (He1): You have a pretty long prename! Why? -> QB2: He2b P1c (He1): Why don't you have such a nice beard like Kirchhoff? -> QB2: He2c P1d (He1): Hey Mr. Helmholtz! Is it correct that Alexander Humboldt and you were friends while you lived? -> QB2: He2d
He2a (P1a): Oh, oh, Wolfgang! Yeah, sure! I'll help you. -> QB2: P2a He2b (P1b): That's because I'm not anyone's Otto (that's my brother's prename by the way). No; just kidding. Actually I'm kind of jealous that I'm not living in your century. I mean, there are so much more beautiful names to choose from nowadays... Like Kevin... Justin James... Sarafina or Alessio... Just awesome. -> QB2: P2b He2c (P1c): Cause his beard is unique. I'm doing my own thang! -> QB1 He2d (P1d): Yes, that's true. He used to help me out in the 1840s. I had to do the military service, but because of him I was dismissed and was allowed to teach anatomy in Berlin. -> QB1	QB2	P2a (He2a): Without requesting me to do anything for you?! -> QB3: He3a P2b (He2b): Thanks for that! But you didn't answer: why do you have so many prenames? -> QB3: He3b

He3a (P2a): Aaaaah! Thanks for reminding me... I almost forgot to put you on a task. Silly me! Well... I'd like to play some beer pong. If you beat me, I'll help you. Will you take this challenge? -> QB3: P3 He3b (P2b): It's a nice thing to remember me more easily. Kirchhoff has his beard, I have my prenames. And of course my different discoveries. For example I studied acoustics, optics and other physics and came up with some findings nobody had ever seen before. In the field of medicine, I also did a lot of research on colour vision. This is known as the additive theory of trichromatic color vision - found by Young and me. -> QB1	QB3	P3 (He3a): Oooooookay. Let's do this! As a wise man once said: beer is the cause of and solution to all life's problems. So: Bottoms up! *Playing*
<<<<<<<<<<<<<<<<<<<<<<<<<<<< PLAYING >>>>>>>>>>>>>>>>>>>>>>>>>>>>		
He4a: Okay congrats! I guess you won. Living in Ilmenau and going to parties seems to be a good way to improve your beer pong skills. Personally, I'm a little bit more interested in inventing things to help humans. But that's not such a big thing. About Goethe... well, the last thing I remember about last night is seeing Wolfgang walking next to Konrad... I mean Zuse. So you should go and talk to him. To find Zuse, enter the main entrance of the Zuse building and scan the first escape and rescue plan on the right side. But before that, have a closer look at the painting upstairs in the foyer of the building named after me. Grab the item there and take it with you. You'll definitely need it. ->QB3	QB4	P4 (He4a): Perfect. Thank you very much, Helmi! -> QB5: He5
He5 (P4): No worries, my sister from another mister. Or brother from another mother. See you!	QB5	*Next Chapter*

Chapter 4 – Konrad Zuse

Zuse (Z)	Question Bloc	Player (P)
Z1: Hi Fan, what's up?	QB1	P1a (Z1): Hi Mr. Zuse! Goethe is lost and it's my quest to find him. I've already been to Humboldt, Kirchhoff and Helmholtz. Eventually I ended up here. You have to help me! The whole city needs Goethe! -> QB2: Z2a P1b (Z1): Hey Zuse! How is it possible that you're hanging around with the

		other famous scientists? Haven't you lived in another century as them? -> QB2: Z2b P1c (Z1): Konrad, with the Z3 you built the first functional, fully automatic, program-controlled and freely programmable computer in the world. So - what's your favourite music song? -> QB2: Z2c
Z2a (P1a): Yeah, sure. The boys told me that you would come over. Well... unfortunately we have to solve another problem before we can talk about Wolfgang. Z2b (P1b): Yes. They did. But since Ilmenau built this campus, I wanted to meet the crew of my neighborhood. Therefore, I developed a time machine and travelled back to chill with them. => QB1 Z2c (P1c): I will tell you my favourite two. The first one is "Wake up, little Zusi" from Simon & Garfunkel. Sometimes I think they just wrote it for my Z3. And the second one is this one song of the artist '50 Cent'. It's called "Just a lil bit". My Z3 handled every 8-bit command - matches perfectly, don't you think? -> QB1	QB2	P2a (Z2a): Okay. Which problem? -> QB3: Z3
Z3 (P2a): As you as a citizen of Ilmenau might know, sun is not always a constant here. Last night it rained a lot and now the latest version of my Zuse, Z26, is in danger! Luckily, it's standing on a desk. But the whole room is getting full of water. I cannot open the door to get inside the room and rescue Z26. You have to convert decimals into binary numbers to open the door lock. Will you help me? ->QB3	QB3	P3a (Z3): Mission accepted. Show me the room! *Playing* P3b (Z3): Why don't you do it by yourself? -> QB4
Z4 (P3b): Because I'm not in the right mood for it. Do you know how I'm feelin'? The adjective rhymes with "run over" and that is exactly what the water will do if you think for any longer... You know, it's been a long night at the student club… maybe you can understand me.. -> *Playing*	QB4	*Playing*
<<<<<<<<<<<<<<<<<<<<<<<<<<<< PLAYING >>>>>>>>>>>>>>>>>>>>>>>>>>>>		
Z5a: Thank god - you saved my work! My lovely little Z26! Now I can restart my business! But let's step back to our discussion about Goethe. When I last saw him, we were in front of the student club. He told me, he had something to think about. Therefore, he wanted to go to a place where it's quiet and people are not allowed to talk. The only place in today's world where all poets and thinkers come together. Hopefully you know where to look for him.	QB5	P5a (Z5a): Then I'll go. Bye! *Next Chapter* P5a (Z5b): Sorry, Konrad. I'll try it again! *Playing*

Before you leave, have a look at the Zuse building model right behind you. You'll find an item there which Goethe gave me after he lost at Beerpong against Helmholtz. Maybe it's important for finding him… By the way, thanks for helping me. -> QB5: P5a Z5b: OMG... my prototype is destroyed! Thank god I have one more prototype standing in another room. Please at least be my hero and rescue that one from Ilmenau's forces of nature! -> QB5: P5b		

Chapter 5 – Johann Wolfgang von Goethe

Goethe (G)	Question Bloc	Player (P)
G1: What do you want, kid? I am tired of this city! No one really remembers me. I didn't want to be found, I just wanna be gone!	QB1	P1: But... Goethe... don't do it! I am sure the city of Ilmenau still loves and remembers you... a lot!
G2: I'm not falling for this one! I sure am better in another place!	QB2	P2: No, Goethe! Don't go! We need you! Look here! I got some belongings of yours that you have lost! And I am really sure they are very important to you! This one Humboldt gave me! It represents the "Osterspaziergang". A monolog from Faust, one of the brightest and most beautiful piece of art the world has ever seen. This will never be forgotten. And here is the magic wand! Kirchhoff gave it to me! It is so wonderful and I know what it means for you too! At least I guess...
G3: Oh, really? And what does it mean?	QB3	P3 You have a really famous ballad, called "Zauberlehring" or "sorcerers's apprentice" in English. It teaches us not to be arrogant and shows us how important a master is for an apprentice to learn. It doesn't stop there! Helmholtz gave something to me, too! This fist represents your masterpiece: "Faust" (fist in German)! A work of a lifetime! We all thank you very much for your effort and your influence on the literature around the world! This will never, never, ever be forgotten! And least, and also last! The crown Zuse gave me! This reminded me of the "Erkönig"

		(König=king)! The first natural-magic ballad ever! Again, you revolutionized the environment around you! That's why we need you, Goethe! You have a revolutionary soul and an unmeasurable importance for Ilmenau. Similar to the "Zauberlehrling", let us from TU Ilmenau be your apprentices!
G4: Well son... You made me remember a bunch of stuff and I am amazed about how much you know about me and how well all of my scientist friends cared about my beloved things! I guess I am giving Ilmenau a second chance! I will be your mentor!	QB4	***THE END*.** ***FIN***

3. Feature Set

3.1 General Features

Reality based world: story designed throughout the different buildings in TU Ilmenau (Humboltzbau, Kirchhoffbau, Helmholtzbau, Zusebau and Leibnizbau). 3D graphics superimposed on device's camera's image (Augmented Reality). The player can dialogue with 3D-AR-versions of the scientist's and play mini-games.

3.2 Gameplay

"Walk & Click": similar to point & click, but by walking around the real world. Puzzles and storyline elements will be superimposed on device's camera's image as soon as a designated keyframe is scanned and your GPS location is checked.

Progress is reached by talking to the scientists who will give you some tips about Goethe's whereabout if a favor is done for them.

Favors include different types of minigames, from playing beer-pong to converting decimals to binaries.

4. Gameplay

4.1 Gameplay Description

“Walk & Click”: similar to point & click, but by walking around the real world and interacting with keyframes. Puzzles and storyline elements will be superimposed on device’s camera’s image (Augmented Reality) as soon as a specified keyframe is scanned. The puzzles require hand-eye-coordination, basic mathematical understanding as well as logical thinking.

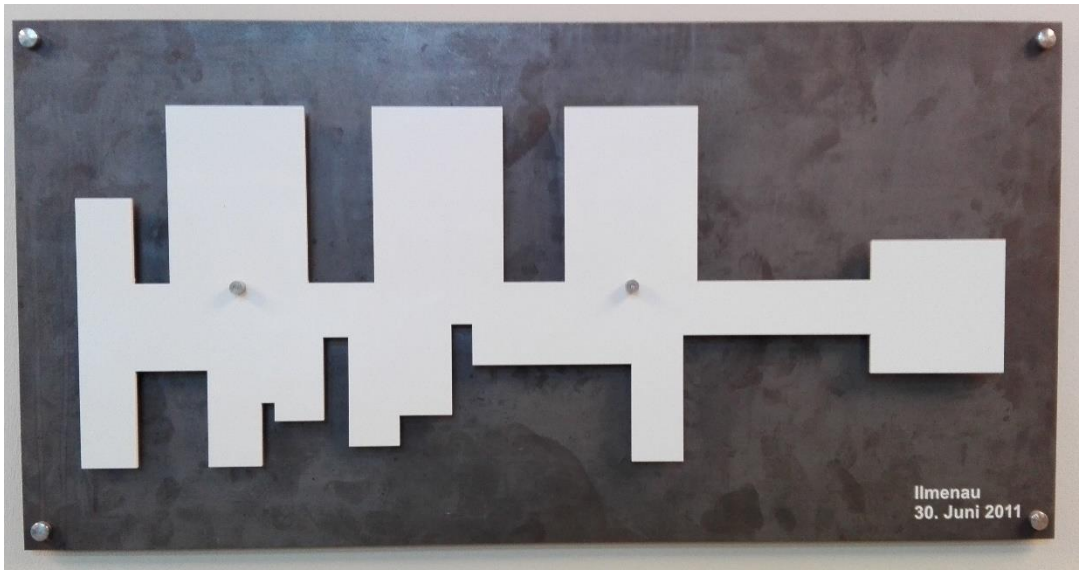

Figure 4: Keyframe Example – Zusebau

4.2 Controls

The player navigates through the real world by foot. As soon as a specified GPS location/area is reached, he can start the augmented reality experience by scanning the keyframes (e.g. a rescue plan) on the smartphone or tablet screen. The player will interact with these elements via touch screen. For two of the mini games a virtual touch-joystick is used.

4.3 Interfaces

In the idle mode of the game (i.e. at any arbitrary location, no matter if there is a ‘checkpoint’ or game element to interact with), there is a user interface that shows the progress in the storyline as well as possibly collected items.
Because of the inherent Augmented Reality characteristics of this game, the graphical user interface is reduced to a minimum. It can be divided into two parts: the main menu and the in-game user interface.

4.3.1 Main Menu

Figure 5: Main Menu

The main menu contains a blue background with a basic geometric pattern. Above the prominent game title “Goethe was here”, a portrait of Goethe is displayed. It is censored to emphasize the “badass” character the developers wanted to assign to Goethe. Some basic cyan-colored buttons help to navigate through different submenus. The submenus use a more low-key background without the game title to increase readability and clarity. Colorwise, the menu is designed to fit the corporate design of TU Ilmenau, because its campus acts as the game world and the game has a strong connection to the university and Ilmenau in general.

4.3.2 In-game Interface

The in-game Interface can be divided in two parts: a static (left screenshot) and a dynamic one (right screenshot).

The static part provides a stable interface for the user to interact with. Its elements are always located on the same place on the screen without the need of a keyframe. The static part consists of the scientist’s avatar, the inventory as well as hints and for the mini games a score display.

Figure 6: Static Interface

Figure 7: Dynamic Interface

With the dynamic part the player can control the progress of the story. He can interact with the dialogue and has several options to choose from.
For an overview of the interfaces is described in chapter 7.1.

4.4 Rules

The player has to follow the storyline. It doesn't matter how long he's talking with the scientists the outcome won't change. However, every chapter of the story should have an endpoint, no matter which decisions were made. In the end winning the mini games is the essential part to bring everything forward. The rules of them are described in the following. The game instructions will be displayed right before the mini game individually.

4.4.1 Catching Falling Collectibles (CFC):

In this game you have to feed Humboldt's spider, Raffael.

The more flies you eat, the higher your score will be.

- Normal sized flies give you 10 points, the big ones 50 points, but they will speed up the falling collectables.
- Normal sized bees on the other hand lower your score by 5 points, the big ones by 25 points plus they will slow down the falling collectables.
- The hourglass will slow down the speed of the spider,
- Goethe's energy drink will respectively increase it.

You move the spider by using the joystick on the lower right corner of the screen. The quest ends after 90 seconds.

4.4.2 Circuit Racing (CR):

For this game you have to move the electron along the circuit to light up several checkpoints by moving through them. You can move the electron with the joystick on the lower right corner of the screen. The game ends if you have lightened up all checkpoints.

Beware: moving beyond the circuit is not recommended. It makes your electron move very slow and will reset you to the start point.

4.4.3 Beer Pong (BP):

For this game you have to throw the white ball into the red cups. After throwing into a cup, it disappears. The faster you hit the cup, the higher your score will be. The game ends after you have hit all 10 cups.

Move the ball by touching the screen and sliding your finger to the left or right. Adjust your throwing force by sliding up or down. Release your finger to throw.

4.4.4 Flooding Room (FR):

For this game you must translate the number on the top into a binary number. You can do this by pressing on the four digits below the keyframe. They will then change from 0 to 1 or from 1 to 0. Once you have the right combination of digits, another number will appear that has to be translated next.

But hurry up! The room in the middle is flooding and you must finish the game before the room is full of water.

Please note: the binary numbers are read from left to right (8-4-2-1)

4.5 Winning Conditions

The player wins

- if he has solved each of the four mini games,
- if he has found all four objects in the buildings Humboldtbau, Kirchhoffbau, Zusebau and Helmholtzbau
- and if he has finally found the box in the library that only can be accessed with the previously collected items.

There is a high score system so players can compete. The score depends on how good the mini games have been completed.

- In **CFC** you get the score based on the value of the collectibles you collected.
- In **CR** you get points for reaching the checkpoints and for completing the game quickly.
- In **BP** you get points for hitting the cups as possible.
- In **FR** the score is based on the time needed to solve the game at all.

The faster you complete a mini game the higher your score is.

The score can be compared for the individual games or on a final ranking with all results added up. The comparison is not implemented in the actual game but would rather happen on a "look what score I got in that game"-basis when multiple players are exploring the campus at the same time.

5. Game World

The world will be set to be the Hans-Stamm-Campus of TU Ilmenau. As it will be an augmented reality game, just some virtual graphics will be shown augmented to the camera's picture, such as: famous scientists, Goethe's items. The four mini games will be eacht initiated after the player met the four scientists in each of the buildings. After talking to the scientist, they will put the player in a task and will let him search for an item. Humboldt for example wants you to feed his pet which he had picked up during a long journey in South America. Another one: Kirchhoff had just invented a new electricity network and wants the player to test it. However, Helmholtz wants you to calm down and play a little beer pong match against you. Last but not least, the player has to be Zuse's hero because his fresh prototype Z26 is in danger... Plus, as already mentioned, they all give you a hint to look for a special item when the mini game is finished.

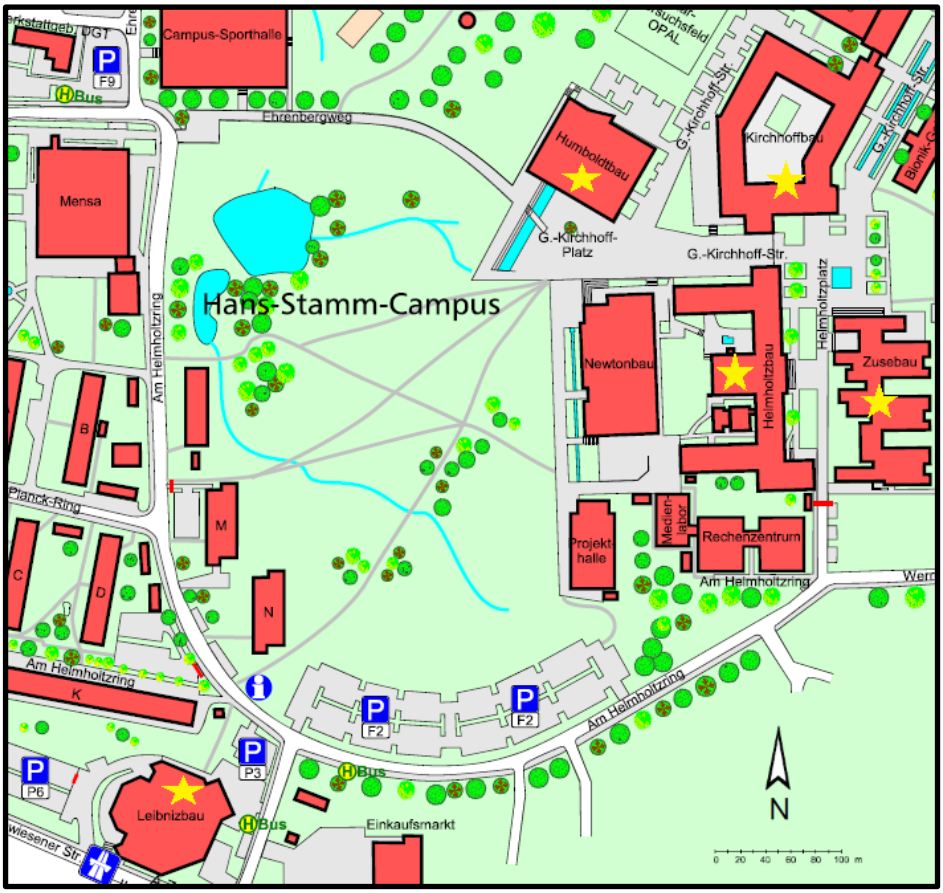

Figure 8: Game world (buildings in the game marked with stars) [1]

[1] https://www.tu-ilmenau.de/fileadmin/media/intranet/informiert/mediapool/lageplaene/Campus_farbig.pdf

6. Game Characters

6.1 Overview

The protagonist of 'Goethe was here' is the player himself, even if he is not visible on the screen. He has to find Goethe. The four scientists, Goethe's best friends, Alexander von Humboldt, Gustav Robert Kirchhoff, Hermann von Helmholtz such as Konrad Zuse all take part as minor characters. They help move the plot events forward. And last but not least, the game contains the main character Johann Wolfgang von Goethe (see picture 5).

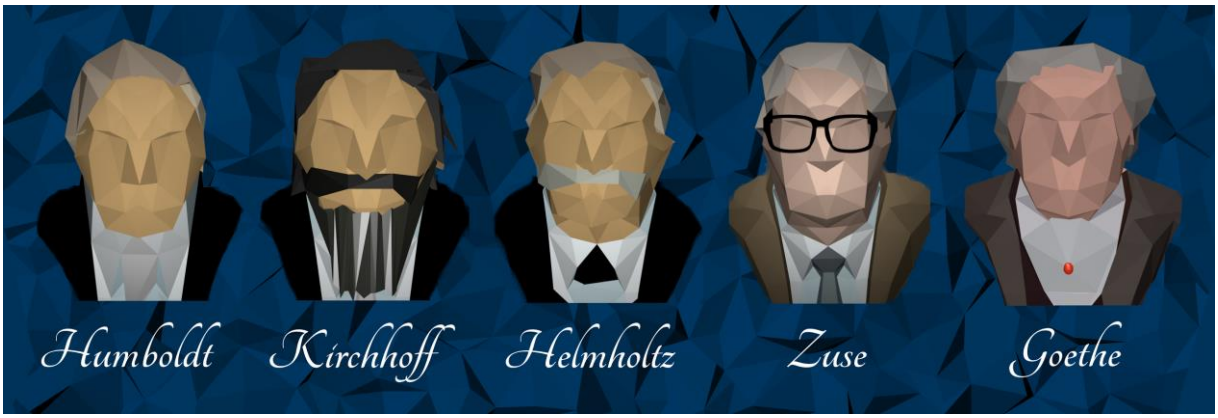

Figure 9: The main characters of the game

The scientists as well as Goethe are flying on a cloud / smoke. This is a design decision to emphasize that they are already dead and lived prior to the actual time of the game. In order to not go beyond the scope of the work each of them will be presented shortly in the following sections. For further information, the reader can have a closer look at the sources mentioned above.

6.1.1 Alexander von Humboldt

Figure 11: Humboldt low-poly

Figure 10: A. v. Humboldt[2]

Alexander von Humboldt (*1769 - † 1859) also known as the 'second Columbus', was a German polymath, geographer, naturalist, explorer and influencer of philosophy and science. Throughout his life he has travelled extensively. Since 1856 he is an honorary citizen of Berlin. Today several stamps carry his picture and countless animal species, geographic objects, places, schools and institutions bear his name. Unlike the other scientists, Humboldt and Goethe had a real connection while they lived. They nurtured each other a certain esteem for one another.[3]

6.1.2 Gustav Robert Kirchhoff

Figure 13: Kirchhoff low-poly

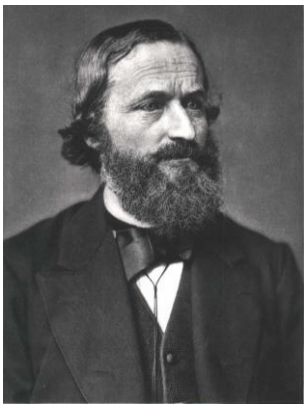

Figure 12: G. R. Kirchhoff[4]

Gustav Robert Kirchhoff (*1824 - † 1887) was a German physicist who, for example, discovered the spectrum analysis (together with Robert Bunsen) and who came up with the rules for the electrical circuit technology of network analysis (Kirchhoff's circuit laws). "In 1875 Kirchhoff was appointed to the chair of mathematical physics at the University of Berlin."[5]

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[2] https://en.wikipedia.org/wiki/Alexander_von_Humboldt

[3] http://www.whoswho.de/bio/alexander-von-humboldt.html

[4] https://de.wikipedia.org/wiki/Gustav_Robert_Kirchhoff

[5] https://www.britannica.com/biography/Gustav-Robert-Kirchhoff

6.1.3 Hermann von Helmholtz

Figure 15: Helmholtz low-poly

Figure 14: H. von Helmholtz[6]

Hermann von Helmholtz (*1821 - † 1894), also known as the 'Reichskanzler of Physics', was a German physician and physicist. His researches came from the fields of physiology, psychology, electrodynamics and chemical thermodynamics. One of his most significant works was his statement on the conversation of energy.[7]

6.1.4 Konrad Zuse

Figure 16: Zuse low-poly

Figure 17: K. Zuse[8]

Konrad Zuse (*1910 - † 1995)[9] was a German civil engineer, inventor and computer pioneer. He built the first functional, fully automatic, program-controlled and freely programmable computer in the world.

[6] https://de.wikipedia.org/wiki/Hermann_von_Helmholtz

[7] https://www.thefamouspeople.com/profiles/hermann-von-helmholtz-4828.php

[8] https://www.welt.de/kultur/literarischewelt/article4133350/Konrad-Zuse-erfand-aus-Faulheit-den-Computer.html

[9] https://www.dhm.de/lemo/biografie/biografie-konrad-zuse.html

6.1.5 Johann Wolfgang von Goethe

Figure 19: Goethe low-poly

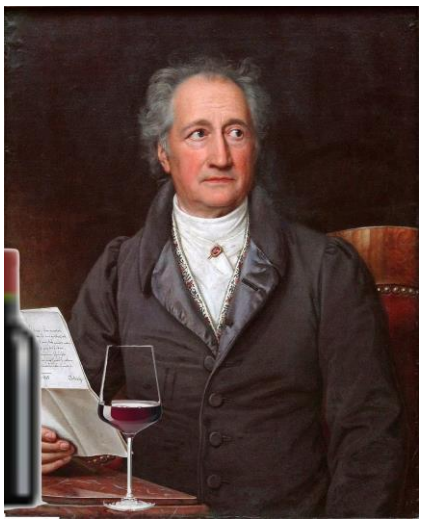

Figure 18: J. W. von Goethe[10]

Johann Wolfgang von Goethe (*1749 - † 1832) was a German writer and statesman. He became famous because of his lyric poetry and verse dramas, but he was also very interested in the wonders of nature. For example, he designed his own color scheme and did researches about anatomy, botany, mineralogy, optics and other scientific fields. Throughout his life, Goethe visited Ilmenau a few times and also lived there for a while. [11]

6.2 Enemies, Monsters and other Types

There are a few sidekicks like Alexander von Humboldt's Spider, 'Raffael', which Humboldt caught during a trip to South America and which is his pet now. Or for example the energy drink within the first mini game, as it is a 'Fist-Energy Drink' sponsored by Goethe and recommended by the four scientists.
Furthermore, there are the four personal belongings of Goethe, which the player has to collect. Those four items are obviously no virtual persons, but they have a deeper meaning as they are representing works of Goethe and therefore are some kind of a different type of character.

All in all, there are no typical enemies in 'Goethe was here', besides:
the player's inability to solve the puzzles.

[10] https://de.wikipedia.org/wiki/Johann_Wolfgang_von_Goethe
[11] http://www.goethezeitportal.de/wissen/enzyklopaedie/goethe/goethe-biographie.html

7. Media List

In this chapter an overview over the media used in this game is given. One of the main aims of the game was to have a unique look that also resembles the university and life in Ilmenau to some extend ("nice, unique, homely and not too fancy"). As it is quite a mammoth task to develop a whole game in half a year, the developers awarely chose simple and low-key graphics for the game. To meet the uncommon characteristics of the game setting, variations of already available content were created. Sources to these assets and a description of the formation process of the adjustments are given in this chapter.

7.1 Interface assets

As mentioned in chapter 4.3., the interface is divided into two parts: the main menu and the in-game interface. Both use different elements as described in the following.

7.1.1 Main Menu

- The blue background with geometric pattern is created with Ulead PhotoImact 11.
- For the game title, the "Tangerine"[12] font was used.
- The portrait of Goethe was accessed from the Internet[13] and supplemented with the censoring by the developers.
- All buttons as well as the scroll bar in the help menu are part of the UI Assets of the Unity Engine.
- The lock symbol in the highscore menu was created by the developers in Gimp 2.8.

7.1.2 In-Game Interface

- The **scientist avatar** was created by the developers by combining 2D pictures of the scientist models (see chapter 7.3.) and the previously mentioned blue background. Furthermore, the name of the scientist was added.
- The **inventory** consists of the previously mentioned blue background and icons for the collected items (see chapter 7.2.). The icons are just 2D versions of the respective 3D models.
- A **hint button** and a text field to display the hint are realized with the Unity engine UI assets.
- The **dialogue boxes**, which are displayed while the player is talking to the scientists, have the same blue background as mentioned before. "Tangerine" is again chosen as a font. The button to navigate through the dialogues was designed by the developers in Inkscape 0.92.

7.2 Environments

As the described game has a strong focus on Augmented Reality, there is no environment in the conventional sense. However, some of the augmented items, which could be categorized as "environment", are listed here.

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[12] Accessed here: https://www.fontsquirrel.com/fonts/tangerine (January 2018)

[13] Accessed here: http://www.wissen.de/lexikon/goethe-johann-wolfgang-von (January 2018)

- In the mini game related to **Humboldt**, the spider Raffael can eat different collectibles. To implement these, the developer team partly used already existing models, like the fly/bee[14] and the hourglass[15]. For the energy drink an already existing model[16] was taken and a special "Goethe"-related texture was designed by the developers to increase immersion into the story.
- In the mini game related to **Helmholtz**, a Beerpong table was implemented by using a simple plane of the Unity Engine. The texture for it can be found in the Unity Asset Store[17]. The Beerpong cups were modeled and designed by the developers using blender 2.79.
- In the mini game related to **Zuse**, a flooding room with a computer in it was modeled. Only standard assets of the Unity Engine were used for this.
- Different items can be collected by the player during the course of the game. All items (easter egg[18], magic stick[19], hand[20], crown[21]) were accessed in the Internet and adjusted to fit the game setting if necessary.

7.3 Characters

- The only humanoid characters in this game are the four scientists and Goethe. As it is hard to realistically model humans, the developers picked a low poly human model[22] as a starting point. This was then adjusted to be more similar to the respective character by adjusting the model in blender and changing the textures. Furthermore, for Kirchhoff and Helmholtz beards were added. Zuse's model was enhanced by adding glasses. All humanoid characters are flying on a cloud which was accessed in the Unity Asset Store[23].
- In the minigame related to **Humboldt**, the model of his pet spider Raffael was accessed in the Unity Asset Store[24].
- In the minigame related to **Kirchhoff**, the electron / electric charge car was modeled taking Unity Engine's standard assets and particles.

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[14] Accessed here: https://free3d.com/3d-model/bee-89226.html (January 2018)

[15] Accessed here: https://free3d.com/3d-model/hour-glass-70220.html (January 2018)

[16] Accessed here: https://free3d.com/3d-model/collection-of-energy-drink-cans-32470.html (January 2018)

[17] Accessed here: https://assetstore.unity.com/packages/2d/textures-materials/wood/yughues-free-wooden-floor-materials-13213 (January 2018)

[18] Accessed here: https://free3d.com/3d-model/easter-eggs-23231.html (January 2018)

[19] Accessed here: https://www.turbosquid.com/FullPreview/Index.cfm/ID/810456 (January 2018)

[20] Accessed here: https://www.blendernation.com/2015/10/10/free-3d-blender-model-download-hand/ (January 2018)

[21] Accessed here: https://www.turbosquid.com/FullPreview/Index.cfm/ID/1146355 (January 2018)

[22] Accessed here: http://www.denysalmaral.com/2016/11/free-lowpoly-donald-trump-3d-character.html (January 2018)

[23] Accessed here: https://assetstore.unity.com/packages/vfx/particles/white-smoke-particle-system-20404 (January 2018)

[24] Accessed here: https://assetstore.unity.com/packages/3d/characters/animals/animated-spider-22986 (January 2018)

7.4 Animation

- The animations for all humanoid characters were created by the developer team in blender. Each character has between 2-4 different animations, including welcoming moves and happy or sad reactions. The animations were switched by sophisticated state machines implemented in Unity Engine's Animator Controller.
- In the minigame related to **Humboldt**, the animation of his pet spider Raffael is included in the respective model and controlled with a simple C# script.

7.5 Music and sound

As we didn't want the game to be too overloaded and unclear, the game audio and music was reduced to a minimum.

- During the introduction sequence, a music loop out of Franz Schubert's well-known composition "Der Erlkönig"[25] is used. It is a musical interpretation of Goethe's identically named poem which appeared very fitting to the developer team. Furthermore, an authentic scream[26] was added to the last scene to emphasize the disappearance of Goethe.
- Each mini game has a unique music loop. The loops for the **Humboldt** and **Zuse** game are part of one of the developer's music production sound library. For **Helmholtz**'s mini game a music loop was accessed in the Internet[27].
- The opening and closing sounds of the inventory are part of an inventory system package[28] accessed from the Unity Asset Store.
- In the minigame related to **Humboldt**, his pet spider Raffael makes sounds when moving. This sound is part of one of the developer's music production sound library.
- In the minigame related to **Zuse** a sound FX is played back for correct answers. This sound is part of one of the developer's music production sound library.
- In **Kirchhoff** mini game a royalty free piece of music was found on YouTube.[29]

[25] Accessed here: https://www.youtube.com/watch?v=oXaa2JmKWHs (January 2018)

[26] Accessed here: https://youtu.be/PpccpglnNf0?t=24 (January 2018)

[27] Accessed here: https://www.bensound.com/royalty-free-music/track/rumble (January 2018)

[28] Accessed here: https://assetstore.unity.com/packages/tools/gui/inventory-system-10384 (January 2018)

[29] Accessed here: https://www.youtube.com/watch?v=VkO75rFnTLQ (February 2018)

8. Technical Specs

8.1 Technology Analysis (risks/alternatives)

Our greatest risk was using GPS to track the player and build the scenario depending on the location of the device. In theory, this worked quiet well and the GPS positions could be tracked with Unity. However, for actual game play, the developers found it more feasible to deactivate the GPS functionality for a first stable version of the game. As an alternative to the GPS tracking, the game play can also be designed in a way, where instead of depending on the location to display the environment, the player will be able to play wherever he wants provided the respective keyframe is available. This means, the keyframes are still needed and all of them are found in the TU Ilmenau buildings (paintings and rescue and emergency maps).

The developer team however, still wants to improve the game idea and look for more sophisticated solutions regarding GPS tracking for future improvements. This could then also enable the player to replay mini games and have a less linear and deterministic game play.

8.2 Platform & Tools

This game is primarily designed for iPad Air.

8.3 Delivery

The game is installed on the iPad device of the university. However, it could also be distributed as an app in Apple's App Store.

8.4 Game Engine

Unity 3D was used as the game engine.

8.5 AR Platform

Vuforia AR platform will be used to develop the 3D game features. At first the developer team thought about using Apple AR-Kit, but as they had to struggle with technical limitations it was off the table quickly.

9. Trailer

The official game trailer is available on YouTube[30]. It was planned, shot and edited by the developer team. We genuinely want to thank our actors Laurenz B. and Karolin W. for their support of our project.

Figure 20: Trailer

[30] https://www.youtube.com/watch?v=MUMb1rFjNtU