



University of Applied Science Darmstadt

Faculty of Media

Bachelor of Arts Animation and Game

Dead Care

A game where you have to protect small children from themselves

Goldschmidt, Zoey, 1111448

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Contents	Page
1 Introduction	3
1.1 Project introduction	3
1.2 Project relevance	3
1.3 Project overview	3
2 A+G Design	4
2.1 Concept Art	4
2.2 Final Character Design	5
2.3 Animation	5
2.4 User Interface	6
3 Technical Art / Game Development	8
3.1 Character Implementation	8
3.1.1 Sculpting the first child in blender	8
3.1.2 Retopology of the sculpt in blender using the retopo-flow blender addon	8
3.1.3 Rigging the first character using the auto-rig pro blender addon	9
3.1.4 Making the characters compatible with the same rig	9
3.1.5 Texturing	10
3.2 Manual Rigging	10
3.3 User interface implementation	10
3.4 Importing animations	11
3.5 Sound Implementation	11
4 A+G Methodology	11
4.1 Individual project documentation	11
5 Project Analysis and Conclusion	11
5.1 A+G Design	11
5.2 Technical Art / Game Development	12
5.3 A+G Methodology	12
5.4 Conclusion	12
6 Sources and References	13
6.1 Programs	13
6.2 Tools	13
7 Appendix	13
7.1 Characters	13
7.2 User Interface	13
7.3 Animations	13
7.4 Design	13

1 Introduction

1.1 Project introduction

Dead Care is a game where the player has to guard a room full of children from the dangers of everyday objects and themselves.

1.2 Project relevance

The semester Topic was One Screen, One Set. We wanted to build a game where everything is set in a single room at a time and our goal was to create fun interactions that could bring people to laugh.

1.3 Project overview

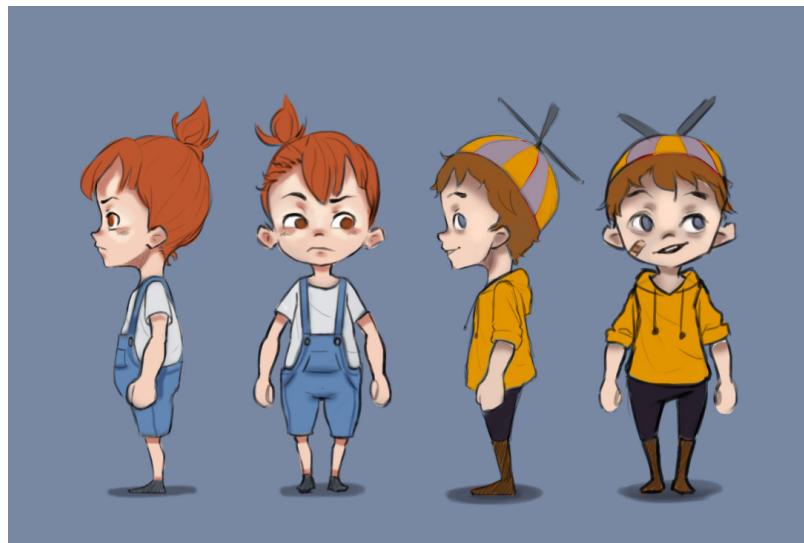
The game is set in a kids room with mostly everyday objects like a wardrobe, a bed, tables, chairs and many other things. The player has a brief time to tape of objects they deem potentially dangerous and move objects around to block access to certain elements of the room. After this short time children start rushing into the room and are eager to interact with the things in the room. Some interactions may be cute and peaceful, while others might be a lot more dangerous for the child that tries to do something with them. Depending on how many children survive their playtime, the player is rewarded with stars and consumables that can be used to make further level slightly more manageable. I will now briefly describe my contributions to the project. I created the children from concept to final 3d characters and was also responsible for their animations. I also created the games user interface, added sounds to the animations and managed our git repository for version control.

2 A+G Design

My initial estimate for design work described in the IPAM was 45%. This was accurate as my work was split between designing the characters and animations and the technical implementations of said contributions.

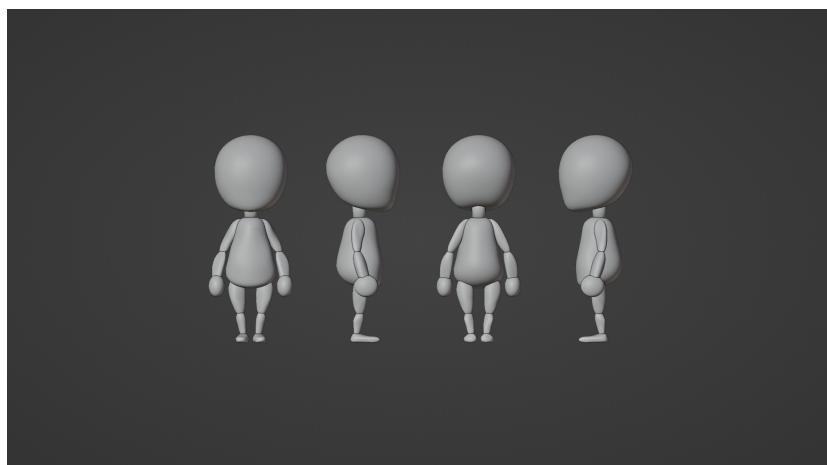
2.1 Concept Art

In this semester project we did not do a lot of concept work because our early designs were immediately approved for production by our vision keeping, as we wanted to have a functioning game quickly. I created these character concepts early in the production and was also tasked with finalizing them as full 3D characters.



Initial children designs – also final children designs

As our game is in an isometric perspective, I created quick 3D blockouts that we tested from an isometric view, to determine what shapes would be readable from that perspective. I then used these models as a base to draw the character designs on top.



3D character blockouts, tested in isometric view

2.2 Final Character Design



3D Characters modeled based on the designs

2.3 Animation

I did all the character and object animations in the game.

Example images:



Wardrobe interaction



Mimic Interaction

I used different approaches for the animations. Some animations, like the wardrobe interaction, I created using straight ahead animation. While for others, like the mimic and the cactus interactions, I first started to animate with constant interpolation as pose to pose. I tried to use different animation principles to learn more about their respective use cases and learned that I prefer pose to pose, when creating more complex interactions that need good timing. Pose to pose allowed me to test the impact of the animations before spending a lot of time, getting the animations fully worked out.

2.4 User Interface

Relatively early on in development I created our first user interface to make testing with other students more streamlined and later created the final Interface with the feedback of our vision keeper. For both user interfaces I took reference from other games to make the user interface intuitive and to not break gaming habits.



Early user interface for testing

Towards the end of the project I redesigned the user interface and worked closely with our vision keeper to make it fit with his ideas.



3 Technical Art / Game Development

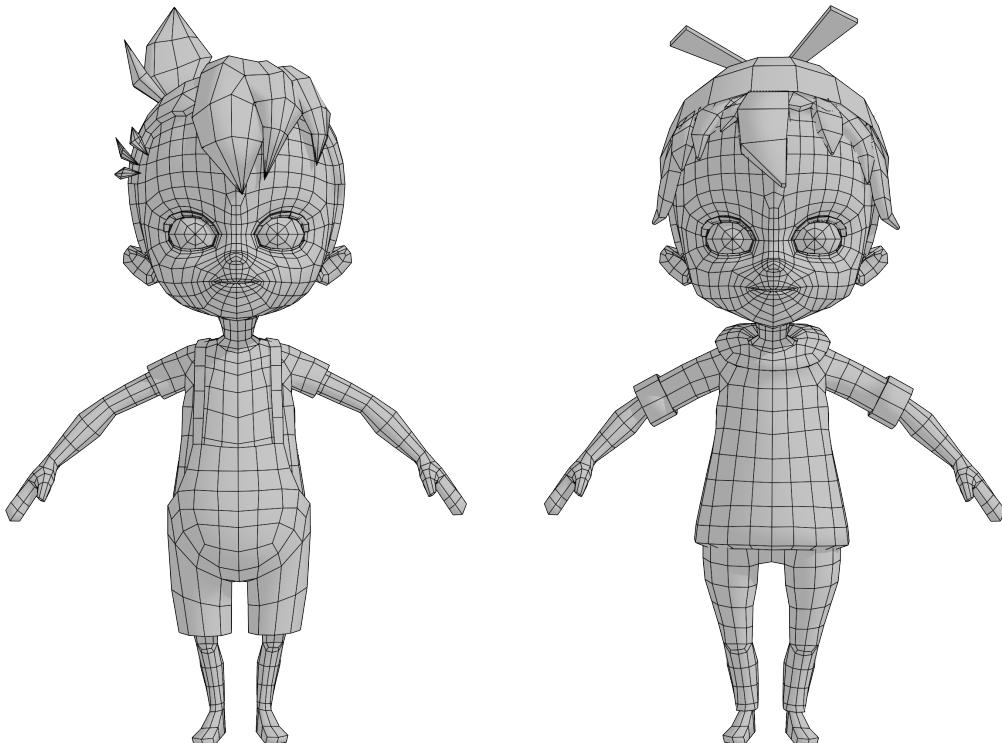
3.1 Character Implementation

3.1.1 Sculpting the first child in blender

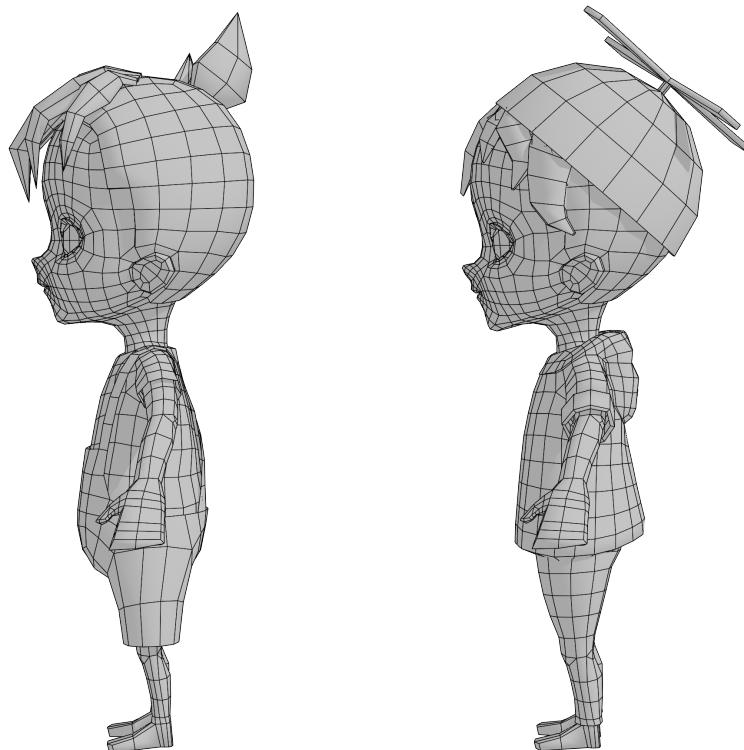
I used blender to sculpt the first character in blender, using the character design sketches shown in the A+G Design section. I only sculpted the body, as I was planning on using the same base character mesh to create multiple characters that would be compatible with the same rig.

3.1.2 Retopology of the sculpt in blender using the retopo-flow blender addon

I used Retopo-flow for the retopology and aimed to keep the poly-count low for the games performance. Both characters have around 5000 triangles. Because we wanted to have facial animation in our game I had to give the head special attention when it came to the retopology. I tried to create proper loop-flow for better animation capability.



Topology of characters (front view)



Topology of characters (side view)

3.1.3 Rigging the first character using the auto-rig pro blender addon

I used auto-rig pro's voxelized method to bind the first character mesh to the rig. Then I used the heatmap method to rebind the head to the rig, so I would get some initial automatic weightpaint for facial movement. Then I manually fixed still existing weightpaint issues.

3.1.4 Making the characters compatible with the same rig

For the second character I reused the body mesh from the first character with the existing weightpaint and adjusted the facial shape a bit without adding or removing vertecies. Then I modeled clothes and hair on top. Then I bound the clothes and hair to the existing rig of the first character using the voxelized method from auto-rig pro. I fixed a bit of weightpaint manually. Because I reused most of the base topology and weightpaint of the initial character, all animations are compatible between both characters.

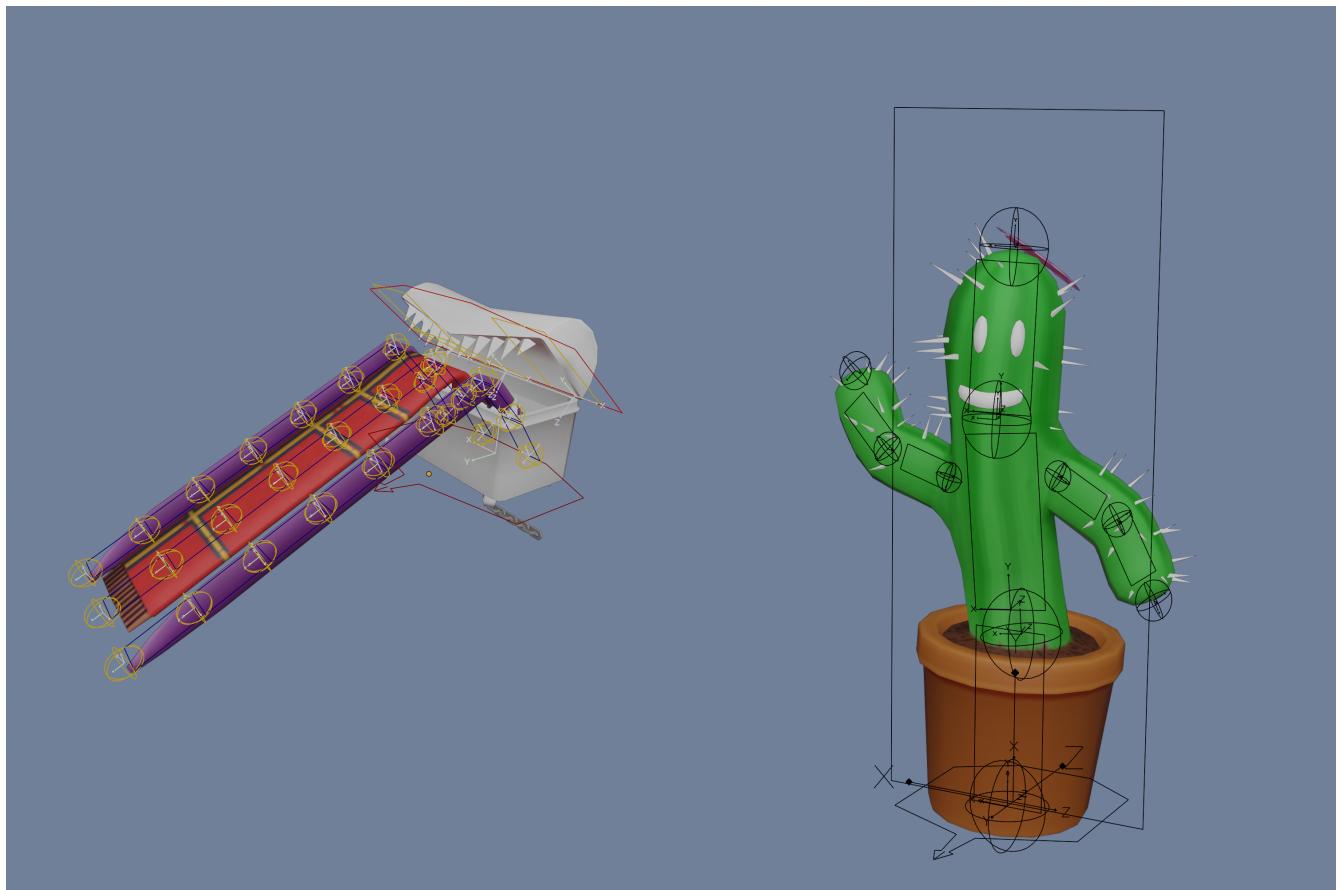
3.1.5 Texturing

I UV mapped the first character in blender and textured them in Substance Painter. On the second character I reused the skin texture and UV map, slightly adjusting its tone in Substance Painter and adding textures to the clothing.

3.2 Manual Rigging

I rigged the more complex interactions we have in the game manually.

1. For the mimic chest I created Fk-chains for the tentacles and tongue with adjustment bones for better animation. I also added some loop cuts for lid deformation and expressiveness and added bones to control the main body and lid of the chest independently.
2. For the cactus I also created Fk-chains to control the character and added volume preserving control bones for squash and stretch.



Mimic rig

Cactus rig

3.3 User interface implementation

I implemented the user interface into our game using unity's old Canvas system and added some functionality using code for setting the resolution, if the game should be in fullscreen and volume of the game. Since implementing the UI I learned a lot more about unity and proper code structure so I have to say that the implementation is not well made. Because we had to connect the user interface

with the main game code it would mean a lot of reworking to fix the code in the UI and reconnecting it to the main game this late in production again. Therefor the implementation will stay in it's current state for now.

3.4 Importing animations

As I was responsible for all animations, it was also my task to bring them into the engine and work together with our coder to implement them into the game. I had a few issues importing the animations at first. From what I gathered it can be tricky to import some animations from blender to unity even when using proper conversions of scale and coordinate system. Especially for animations that were not based on rigs I often had to remove some unwanted rotations in the animation data inside unity.

Connecting the animations to our game code was also a challenge as we only used two separate animators, one for the children and one for the objects. I had to manually add all animations to the animator, give them two animation parameters following a naming convention and add them into our animation code manually. This often led to some small mistakes taking a long time to resolve as it was pretty difficult to find the issue between all these components.

3.5 Sound Implementation

I was also responsible for implementing sound into our game. First I added sounds to the Menu's and later added the sounds for interactions that were made by our sound designer.

4 A+G Methodology

As anticipated my methodology contribution was at 10%.

4.1 Individual project documentation

Because the synthesis paper was cut from this semester, my contribution in the field of A+G Methodology is this individual project documentation.

5 Project Analysis and Conclusion

In the following I will evaluate my contributions by discipline.

5.1 A+G Design

Even though I am happy with the results of my work in this field, I was not happy by my and my teams approach to it. Because this was a short semester and we wanted to get our project off the ground early, we did not put in a lot of preparation work when it came to character design. We had a general idea of where the style should go, based on some moodboards, but we did not work on the designs for long. Our vision keeping was happy with initial designs quickly and we started producing them very early. I would have liked to iterate on the designs for longer even though I am happy with how the characters turned out. For the user interface the approach was a lot better in my opinion, as I first just created a simple work in progress version and then worked on the final look in close communication with our vision keeping. This allowed for more iteration and ideas and improved the final result, beyond initial designs.

5.2 Technical Art / Game Development

For technical art, most work went very smoothly with only minor problems. I followed a very standard approach of sculpting, retopology, texturing and rigging for the characters. Beforehand I discussed the poly-count goal with our team and build the characters accordingly. As we new from the beginning, that we needed multiple animations and characters, I planned how to create more characters from the initial model early and it worked very well. The only issues I had with technical art where minor issues importing animations from blender to unity. Some animations got random keyframe rotations added, despite proper export settings in blender. Once I figured out that the rotations where created in the animation data, it was easy to resolve the issues by manually fixing the affected keyframes.

For game development I am not happy with my work. I implemented our user interface relatively early on, as it was no one's responsibility because of some miscommunication. I quickly implemented it for smoother user testing. As I had no prior experience with unity's user interfaces, my implementation was way to complicated, using too many scripts and unnecessary dependencies. Sadly I did not have the time to fix these issues early on and later the user interface was integrated more closely into our game code. Afterwards I was not able to rework most systems of the user interface, without causing problems with the compatibility with the main code. Therefor it was not a priority and was not changed for the finished project.

5.3 A+G Methodology

I was not responsible for production management or vision keeping and have not much insight into these disciplines based on this project. But I would like to have a bit more structure for future productions. We had no clear working hours and I sometimes felt like I was doing something wrong when I was not reachable on weekends or holidays. I communicated when I would not be available and it worked out without issues as far as I know, but because we had no defined working hours I was often still stressed about the project, when having leisure time. I think this could be improved and reduce the amount of stress throughout production, leading to a more productive environment.

5.4 Conclusion

I learned a lot throughout this project. I had not much prior experience with unity and now understand quiet a lot about it and I feel like I have gained a way deeper understanding of what it means to build a video game. I also improved my technical art work, quickly building custom rigs when needed. I also gained experience in judging what amount of detail needs to be put into my work, based on the project. The teams communication was mostly good with some hiccups. The experience I gained this semester will improve my future work and I am now way more confident in my knowledge about game creation. Before the project I was a bit scared on working on a game, as I had not much experience.

6 Sources and references

6.1 Programs

- blender
- Substance Painter
- Photoshop
- PureRef
- Fork (as visual git (gitlab) environment)
- Unity

6.2 Tools

- Auto-Rig pro addon for easy rig setup in blender
- Retopo-flow addon for faster retopology in blender

7 Appendix

7.1 Characters

- Girl

- rigged using Auto-Rig Pro addon
- weightpaint
- textures

- Boy

- rigged using Auto-Rig Pro addon
- weightpaint
- textures

7.2 User interface

- All used user interface sprites (Assets/UI_Elements)
- User interface scripts (Assets/Scripts/UI/Menu)
- Work in progress user interface (not in the game anymore; Sprites: Assets/UI_Elements/Sprites)

7.3 Animations

- All in game animations (Assets/Animations)

7.4 Design

- Both character designs found in game
- User interface

7.5 Third party elements

Sounds:

- Footstep sounds – “RUNNING 1” (<https://pixabay.com/sound-effects/search/footsteps/>; 02.07.2023)
- In game music – “Cartoon Background Music No Copyright Free Funny Song” (<https://www.youtube.com/watch?v=p0MKy6CENbY>; 02.07.2023)