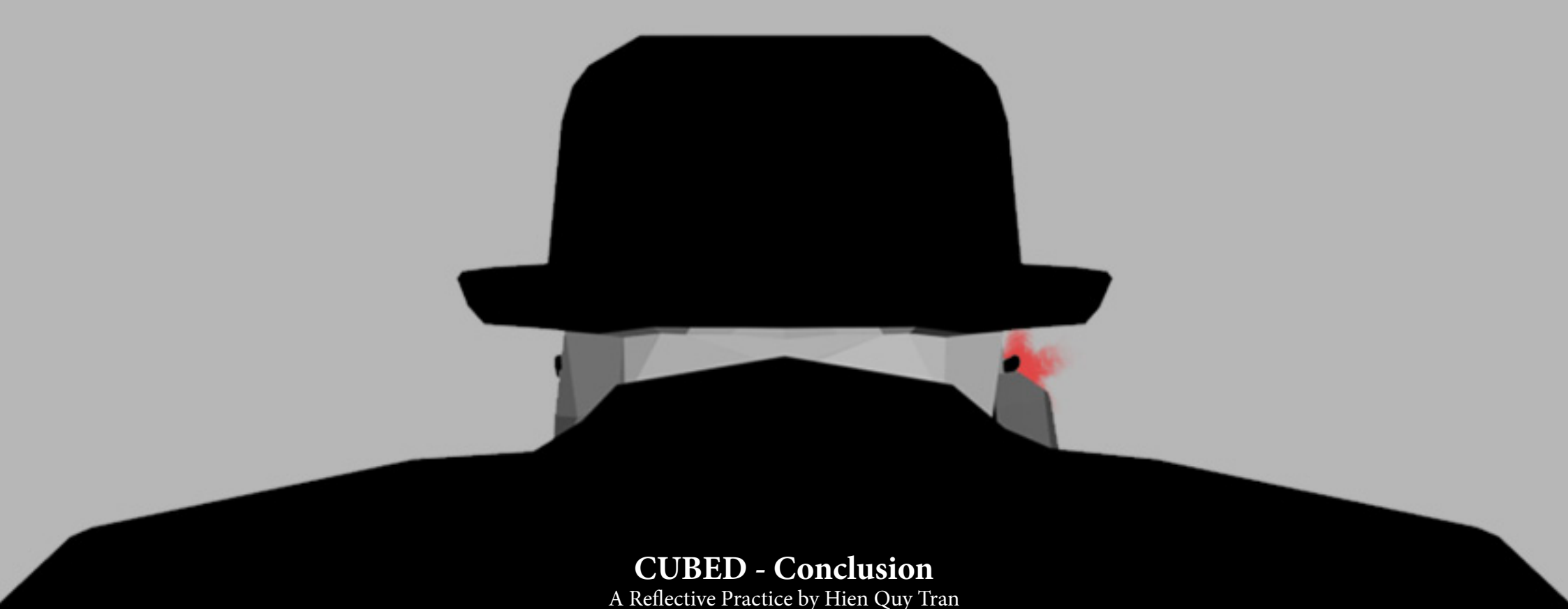

CUBED - Conclusion

A Reflective Practice by Hien Quy Tran

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HTW Berlin - University of Applied Sciences
Lecture: Game Design
3rd Semester

Project: Development of a modular based game in Unreal Engine 4

Illustration by Jeremia

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1. An Introduction to our Project

Concept

"Cubed" is a partly procedurally generated, high score based stealth action game with puzzle elements. Our project was strongly inspired by the Rubik's Cube and is the result of an idea to combine the problem solving aspect of puzzle games with the high tension of stealth action games. We wanted a game, that offers the player a diverse gaming experience with puzzle, stealth as well as jump and run elements. While the player progresses by coloring in the cube, the difficulty raises constantly, making it nearly impossible to color in 100% of the cube. In order to reward highly skilled players without putting too much pressure on beginners speed is a small factor.

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Mechanic

Our most unique feature is arguably the integration of a fully functional Rubik's Cube as the playing field of the game. The player can manipulate this cube within "the principles of Rubik's Cubes"; meaning the player is being able to influence the environment on which her playable character is moving on. The player could, for example, use this feature to rotate obstacles out of the way. While the playable character is able to freely move along all surfaces of the cube, the gameplay can change drastically depending on which surface the playable character is currently active on. While the top surface is being played as a game in top down perspective, the side surfaces are being played as a game in side scroller perspective.

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Artstyle

Especially in regards to the puzzle aspect of our game, it seemed important to us, that the player would be able to keep best overview over the whole cube. For that reason we decided, that the whole cube should fit onto the screen to any given time. This in return forces everything to be far away from the camera, thus appear smaller. Having this in mind, it only made sense to us to use simple shapes and strong outlines for better overview. A cartoony and slightly over stylized artstyle did serve this purpose perfectly.

2. The Development Team

Benjamin Sponagel
Environment Modelling
Material Design
Post Processing

Hien Quy Tran
General Concept
Lead Programming
Level Design

Jasper Stutterheim
Environment Textures Design
GUI Implementation/Design
High Score Screen Design
Particle FX Design

Jeremia Oelschläger
General Concept
Title Screen Design
Help Screens Design
Character Modelling/Animation
Character Textures Design

Ragnar Thomsen
General Concept
Programming
Sound Implementation/Design

Samuel Wetterich
General Concept
Help Screens Implementation
High Score Screen Implementation

Tim Kunt
Character Animation Implementation

3. My Personal Goals and Milestones

"Cubed" is representing my second team project within game development. Looking back at the first team project "Armville", in which I have already gained a lot of experience, my expectations on this project were very high. Because I have assigned myself into a broad variety of tasks on the last project, I was able to widen my knowledge especially horizontally and find out which areas within game development are in interest of me. Having this knowledge, enabled me this time to specialize and to go into more depth especially in regards on scripting and coding.

My goal was primarily to get familiar with the Unreal Engine 4 and then improve my coding capabilities. Because the engine was completely new to me, I had no idea on how easy or hard the transition from Unity 4 to Unreal Engine 4 will be. This again made it even furthermore difficult for me to estimate what specific milestones I can or cannot achieve. Seeing the huge potential to refine myself; setting static milestones did not suit my plan. I did not want to set any specific milestones in beforehand, which I may not be able to achieve or may be capable of surpassing by far otherwise.

4. My Task Area

The purpose of the following section is to give a brief overview of my major tasks, which were relevant for the end result of this project and to give an approximate idea on how many hours I have been spending in those individual tasks by providing the working hours in brackets at the end of every task. Please keep in mind, that the working hours may differ from previous reports due to constant updates, fixes and tweaks. The more detailed report on each task, can be found in my previous reports.

1. In order to have something to start off with, I wrote a function which would **generate the base** of the cube by using three for loops. **(1h)**

2. I then implemented a **camera system** which took me more effort than expected and needed to be updated constantly during the project. **(30h)**

3. Because our game was about manipulating the environment, I implemented a function to **group up and rotate cubes**. Starting with only two dimensions in which the rotation would be possible, it had to be updated at a later stage to make the rotation in all three dimensions possible. Also the controls had to be improved constantly. **(50h)**

4. It was important for our game, that each face of every single cube could be assigned with its own material. This had to be solved through **material IDs**. **(2h)**

5. I then added a **playable character**, which had to be updated constantly due to the progress and changes of our project. **(18h)**

6. Adding the **enemies** and designing their behaviour was a particular exciting task. **(40h)**

7. Due to the nature of our high score based game, we needed a **scoring system**. **(2h)**

8. To give the player more options while being on the sides of the cube; the playable character had to be able to **jump around corners**. **(10h)**

9. In order to avoid progression blockers, in case the player cannot find any way back up to the top surface, I added the **ability to change the gravity**. **(25h)**

10. The **tiles** needed to be designed in a way, so that they would work as obstacles on the top surface as well as platforms on the side surfaces. Also I had to make sure, that they would be equally distributed around the cube each time a game starts. **(30h)**

11. Because the mission of the player is to color in all surfaces of the cube, I had to implement a feature which would enable the playable character to be able to **paint in all the assets**. **(42h)**

5. Recap

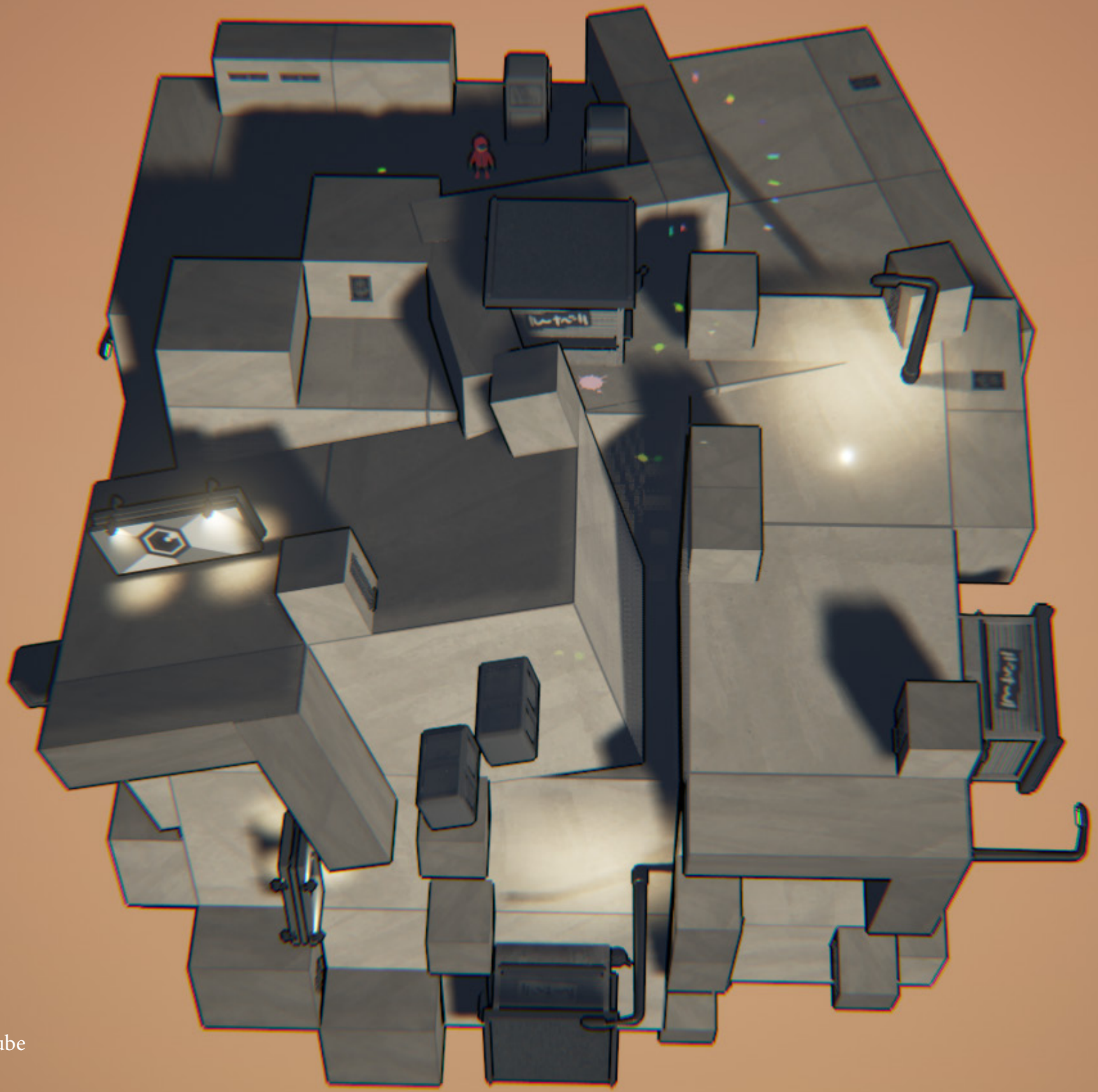
I was from the beginning on extremely motivated and started to prototype with the Unreal Engine 4 immediately. While most of the early scripts, which I have been working on are not in use anymore, they still served a good purpose as scripting exercises and helped me a lot to get into the new engine. This made the transition from Unity 4 to the Unreal Engine 4 working out surprisingly well and I was able to gain more scripting knowledge within game development than I initially thought I would.

I already felt quite confident working with Unity 4. Seeing me now being even more confident with the Unreal Engine 4 clearly underlines the success of this project and my goal in not only transferring, but even expanding my knowledge.

After spending over 300 hours scripting I am relieved to know, that I am still very interested in programming. I realized though, that I have to be careful not to be overambitious in future projects. After having two very intense projects, in which my primary task was to swallow as much information and gain as much knowledge as possible, I see the urge to learn how to improve my work-life balance for future projects.

Although I was not able to set a specific goal and milestone from the very beginning, I feel like having surpassed my expectations by far. Not only that I am very satisfied about the result of our game, but more so about the progress and experience I have been gaining with this project. Since I was able to find a solution for every scripting problem I was encountering, I believe, that I have improved my scripting skills tremendously.

Looking back at my expectations, personal goals and milestones, I would mark this project as a great success. Especially is to mention my great leap forward in programming and understanding of game engines.



experimenting with the cube