My Projection mapping portfolio

By Christiyan Borisov

“Crafting Moments Through Motion and Light.”

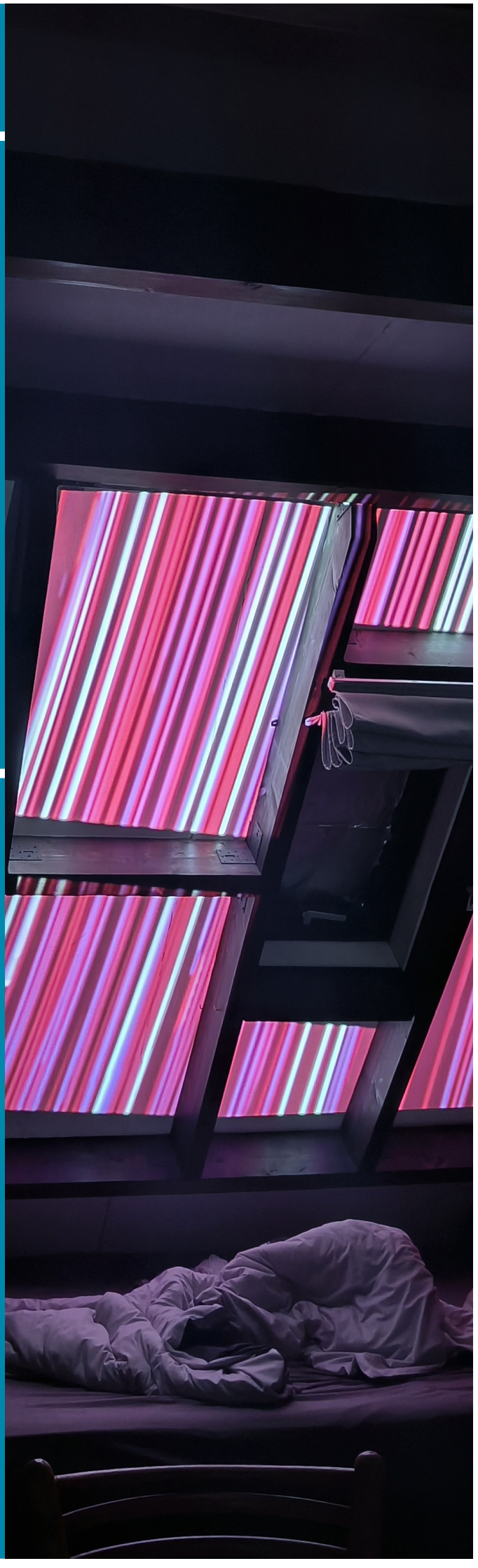
INTRODUCTION

Welcome. My name is Christiyan Borisov. I am a Media ICT student, currently following the Embrace TEC programme at Fontys UAS. This is my projection mapping portfolio, showcasing my work for this semester's personal project.

I was introduced to projection mapping by one of the workshops of the semester flow. I was the only one that attended it, yet it really suprised me. I have always wanted to work a job that involves this. That is why I decided to create a portfolio, showcasing my work, projections, advancements, struggles and successes.

Thank you for joining! And please, come along for the trip!

TABLE OF CONTENTS



THE EQUIPMENT

Before starting my journey of projection mapping I had to obtain some equipment and software. For hardware I would only need:

-PC/Laptop with monitor output
-A projector
-HDMI cables to connect the projector to the computer
-A smartphone in order to take reference photos for mapping

For software however, it is more complicated. Originally I use HeavyM as an all-in-one solution. It is beginner-friendly, however It has some limited resources and obtaining it legally is very expensive. That's why using the demo version as a temporary solution gets the job done.

After an interview with a professional, I was told that the following applications are used for making professional grade projections:

For content creation:
-Adobe After Effects (AfterFX) – 2D compositing, animation, content creation
-Houdini – Advanced 3D simulations and procedural modeling
-Blender – 3D modeling, animation, and compositing (including 2D/3D hybrid work)
For Projection Mapping / Playback / Calibration Software:
-Resolume Arena – Real-time VJing and projection mapping (budget-friendly, professional-grade)
-Pixera – High-end media server software, often used in corporate events
-Vioso – Specializes in automatic calibration of projector grids for mapping surfaces
-Disguise – Most complex/advanced media server, used in large-scale productions

However, for my project I will be using Adobe AfterFX for content creation & mapping and Resolume Arena for playback. Below is the projector I will be using for the project.

This is the projector I will be using. It is an Acer model D1P1909. I am happy because I have no idea what is waiting for me regarding my journey.

1 FIRST ATTEMPTS

FIRST ATTEMPT

My first attempt was right after the workshop. I used HeavyM demo to create some basic maps and projections of images I already had on my PC. The app also has build in animations which come in handy.

First canvas I used were a bunch of boxes stacked on top of each other. A better result would have been if the the environment was darker and the boxes were white.

Afterwards I started experimenting at home with smaller boxes and different projector. The boxes were from coffee capsule with whte paper.

I want to point out that altough projection mapping is interesting, it is very difficult to be applied to small objects. That is why it is mostly beamed onto buildings and bigger object.

However, here is my attempt at making a small scale projection. This was my first learning tribute. It is a bit hard to read and detail gets lost due to the resolution. A better way to display it would have been using a big white canvas and bigger object for display.

FIVE WORD STORY

2

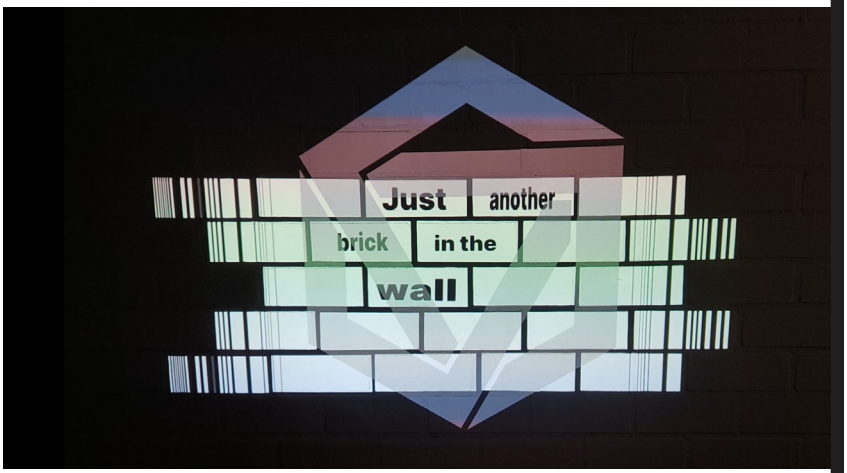
My first more complex shapes in a projection was when i was making the “Five word story“. For this I played with the outline of the bricks on one of the walls in my room. It took some time in order to map each individual brick,

Subsequently I remembered the famous phrase from Pink Floyd “Just another brick in the wall“.

The idea behind the message was that us, the young generation is the future. We must take matters in our own hands. If we don’t do this, you end up being “Just another brick in the wall“, reinforcing problems that become harder to solve.

The projection was okay. It had an animation of lines moving side to side. The only thing that I disliked was the fact that the fonts were different. Some letters are misaligned and some words had bigger font size.

This projection was also made using HeavyM. However, for the next one I will have a different approach when it comes to software. HeavyM does the job but it is too simple and not professional.



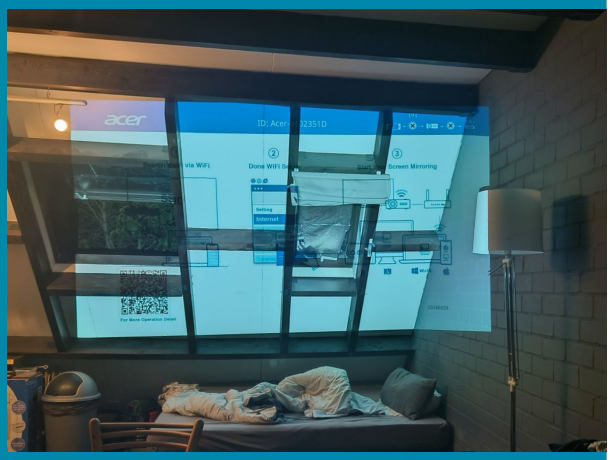
FIVE WORD STORY

3 FIRST PROPER PROJECTION

FIRST PROPER PROJECTION

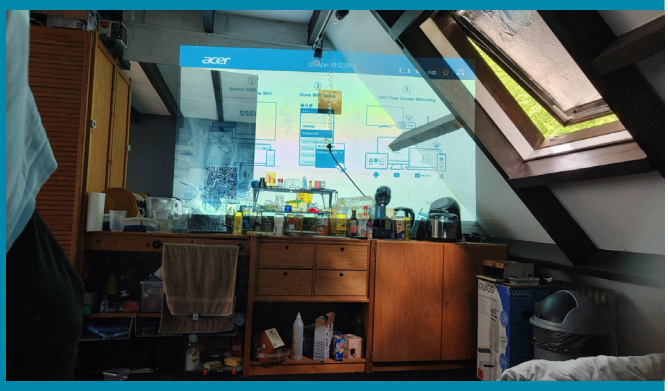
This was the first more “advanced“ mapping project. I decided to make use of the wood for the roofing in my room and use the square shapes to project something beautiful.

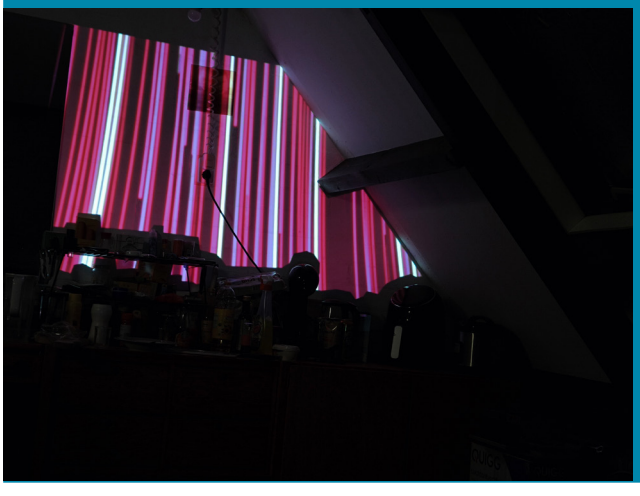
First I aligned the projector in order to see the surface area. Then I traced it in Adobe AfterFX and applied an animation to the masks. The entire process took me a few hours as I am unexperienced with the application.



Afterwards I did the mapping part and displaying using Resolume Arena. This also took some time because of the complexity and crammed UI of the app. Overall that is the process of the professionals. The difference is that they divide the tasks between the sectors. One for mapping, one for the setup and one sector for animations.

Afterwards I decided to do a more complex shape. One involving more polygons. I started the same way with aligning the beamer and making a photo of the area as a reference I will be using in AfterFX afterwards.

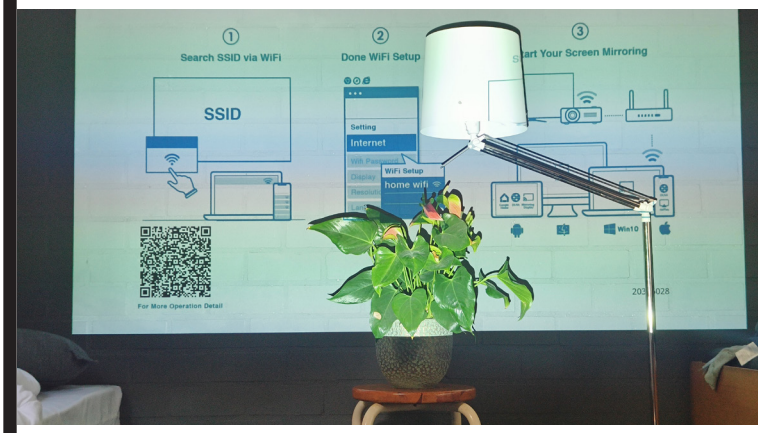




This attempt was the smoothest out of all. Here you can see that air fryer and coffee machine are cut out and there is a small window of animation left of the coffee machine (on the racks with spices).

THE INTERACTIVE PLANT

I wanted to take this as an opportunity to experiment with more complex shapes and multiple animations in one scene. That way I wanted to expand my knowledge with AfterFX and Resolume.



I got a plant and a lamp in my composition. The idea was that the lamp will have one animation, the flowers of the plant will have a second animation and the bigger leaves will have a third one.

The lamp was the easiest one. The flowers were more difficult to map and so were the leaves. The problem here was to try using multiple videos, one for each element because combining everything into one video would be quite difficult. Another problem was finding adequate animations.

Another problem was that I was exporting in .mov files which were heavy and multiple of them would slow down the system. Resolume offers an app in its suite called Resolume Alley. This software is specifically to convert the animation into optimised format exclusive to resolume

At the end everything was hard to align, there were 3 animations behind each other which caused the effects to dim. I was not that satisfied this time.

THE INTERACTIVE PLANT

5

AUDIO REACTIVE VISUALISER

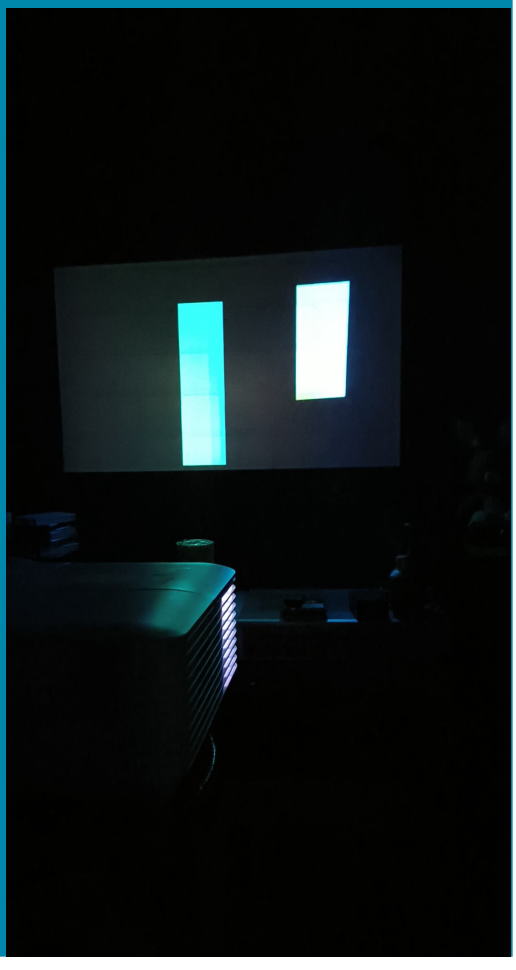
AUDIO REACTIVE VISUALISER

One of my hobbies involve working with audio equipment. One of the things I have been obsessed with since forever is audio visualisers. Like the ones on old cassette decks, the analogue meters in factories, the old reactive effects in windows media player... This was my attempt in recreating one with projections

For this one I limited my use to only Resolume Arena in order to get more familiar with its built in effects.

However, it was a bit of a struggle for me, because It turned out I was using an older version and the questionable authenticity of the application made it so that the majority of the effects was gone.

The original visualiser effect was gone. That is why I used an effect called reveal. Based on the volume levels it revealed more of the background image. Which image was white straight bars.



The effect worked well. It needed more tune and it was not as precise but it did the job.

That's why I wanted to try again with miltiple bands. I made an image of a blue square in Figma, put it in Resolume Arena and adjusted the volume bands. After that I got a second blue line for the mids and applied the same effect.

The final result was not as pleasing but it worked, it was audio reactive and with some more time it could be made bigger.

THE CAR EXPERIMENT

Another thing i like are cars. I love vehicles that have more interesting color than the typical white or black. For this experiment I borrowed my landlady's car and decided to change its color using projection mapping techniques.v

I starder with parking the car properly and taking a photo of it with my phone. Just remember to take the image in 16:9 aspect or the same aspect as your projector. I learned that the hard way.

I first tried the animation of the lamp from the plant map. Tracing the outline of the vehicle in AfterFX was a pain and also when i was mapping it in Resolume. However, the final result was difinitely worth it.

I also tried it with blue dots bokeh effect animation. Although the photo is blurry because of the speed of the animation, it was really eye catching.

Finally, I tried with a solid color. I made the trace using vectors in Figma and then exported it as png. Now when I want to buy a new car It will be easier for me to choose a color.

CONCLUSION

Although a short project, it helped me understand projection mapping much easier. I did overestimate the scope of the project, which really made it a bit stressful. I was warned by the professional I interviewed regarding how the entire thing works. He told me that there are 3 parts of the entire process which divide their company 1 - Mapping, 2 - Animating and 3 - Setting everything up and aligning it. The first and the third part were what was my strenght.

I learned how to use Adobe AfterFX, Adobe InDesign (for the protfolio), Resolume Arena. I learned to make an exposition from start to finish, from mapping the area through animating it all the way to aligning it. I learned that I can't do it on small objects and also I can't do it on very big ones. Everything comes down to the projector capabilities and output size.

I will most probably continue building this portfolio in the future. The entire concept is really fun and although the animations are not that complex, people find it really interesting.

Thank you for coming along with me on this short journey!

For more visual material regarding this project, please scan the QR code below. This is a Google Drive folder with all material.