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Dossier  
for

Developing Media Design Concepts

Digital Media Design

# PROJECT SUMMARY

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My proposed project is titled **Gormley to Glitch** and is a projection mapping installation and a playful exploration of the nature of digital and physical media with a specific focus on how glitch works when projected onto form. For the exhibition, the installation will be presented as a triptych with three original and complementary forms each with their own glitch projection in order to capture a sense of narrative and exploration. The physical forms are inspired by the sculptural works of Antony Gormley and will be designed in dialogue with the glitch content to explore how different forms can play with perception and interact with the glitch aesthetics.

I am also considering adding interactivity and/or glitch music to the installation to make it more playful and instil a sense of exploration for the audience too. I have experimented with a few interaction methods but this will need to be looked at again in more detail to work out the best way to incorporate it in the project.

## SKILLS

I am already capable of projection mapping and creating some glitches using various tools. There are other, more advanced methods which I would like to explore in the experimentation process of this project.

I am less experienced with the physical form making side of the project, and more time will need to be spent to develop these skills and create high quality results.

## CONTENT

All content for this project will be originally created through an iterative, experimental process to explore the impact of glitch when projected on physical form.

## TIME MANAGEMENT

A Gantt chart has been created as an attempt to organise and structure the experimental process. Four small scale experiments (week long) followed by two larger scale experiments (three week long) provide structure and time for learning new skills, trying out ideas and developing forms and glitch art for potential use in the exhibition. The triptych format places emphasis on creating at least three varied forms with projection mapped glitch content with scope for development into a more detailed work dependant on time.

## AUDIENCE

The ideal audience would be people who are aware of both Antony Gormley and glitch art. However this project is designed primarily as a personal exploration of a concept and isn't aimed at a specific demographic. I would like for the final piece to give the audience a chance to see glitch in new and novel way as it messes with their perception of what is real and what is not.

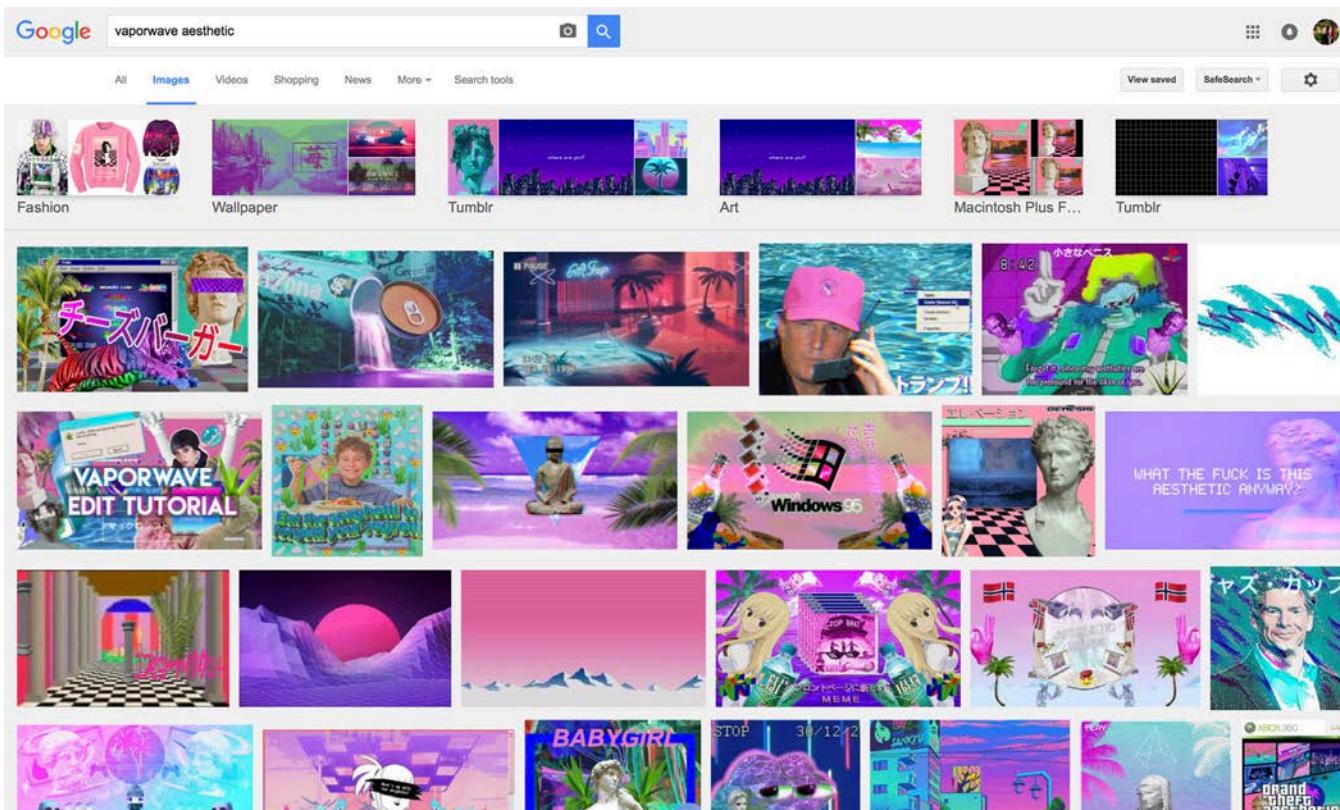
**Videos of the two most relevant artefacts can be found in the folder titled "Artefacts".**

This dossier makes reference to videos of experiments and prototypes which can be found in the folder titled "Supporting Videos". Here, evidence of other relevant work can be found for consideration ranging from some very initial projection mapping tests to experiments with different types of interactivity.

# INITIAL IDEAS

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For the grad project, I want to move away from working within the screen and start working in a physical space; bringing the digital into the real world. To do this, I have chosen to do a **projection mapping** based installation.



Google Images results for "vaporwave aesthetic"

Currently, the theme I want to use is **vaporwave aesthetic**. Vaporwave is a recent avant-garde music genre from the internet which features a lot of samples from songs from the 80s and 90s which are cut up, slowed down and distorted. The music style is a weird mix between lounge, jazz and elevator music.

The aesthetic can be seen as a visual interpretation of the music incorporating elements such as classical sculptures, early computer rendering and animation, glitch, VHS amongst other things.

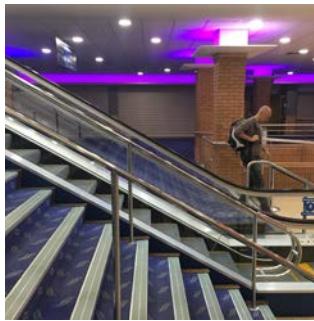
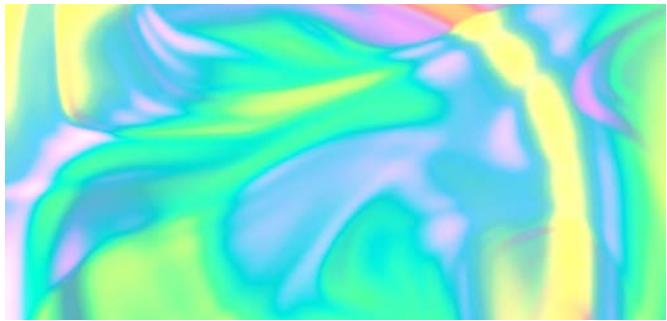
The music and aesthetic style are often roughly cut to draw attention to the digital technology used to create them. This is said to be a comment of the uncanny ubiquity of computing and draw attention to the way it mediates experience.

The style is seen as a satirical critique on capitalist and consumer culture and has been described as "a degrading of commercial music" in an attempt to reveal the "false promises" of capitalism.

So for the project itself I wanted to frame this as an 'aesthetic experience' blurring the boundary between the physical and the digital.

# MOODBOARD

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PANTONE®  
13-1520 Rose Quartz &  
15-3919 Serenity



# TECHNOLOGY

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This project will require a few new skills which I will need to develop over the coming months so that I can realise and explore my ideas.

## CONTENT CREATION

### Adobe After Effects

I have a basic understanding of After Effects having used it in a previous project. This will be used for creating and editing content to project. There are various tools and plugins which will come in handy and will take time to learn how to use.

### Maxon Cinema4D

This is 3D modelling software which I have a basic understanding of. Luckily from my experience it has been rather easy to pick up and learn new skills. If I use this there will need to be time considerations for rendering. From a few tests I have done with this software, rendering with lighting, shadows, physics, and more results in some very long render times which will need to be accounted for.

### Processing

From second year I have a fair bit of experience using Processing and from previous projects I have a large base of snippets and examples I can use to quickly prototype ideas for the grad project. One thing which might be particularly useful is OpenCV's face tracking which I have used considerably. Face tracking is a great way for adding interaction with a very low barrier to entry as everyone has a face and is automatically able to interact with the work.

### Quartz Composer

From some initial research, Quartz Composer is used in a few projection mapping projects as it allows for real-time rendering of complex and sometimes interactive graphics. I don't have any experience using this so if I need to use it, more time will be needed to be allocated so that I can learn how to use it properly.

**EDIT:** Coming back to this section, I have found a few patches and plugins for Quartz which allow for real time rendering of glitches which will be worth spending time with and experimenting with for the project.

## PROJECTION MAPPING

### MadMapper

This is some software which I have only recently started to learn. It is a tool for projection mapping which allows you to map onto physical objects by manipulating surfaces so that the line up with the objects. It also offers different ways to control the software which might be useful to learn if I wanted to make this project interactive. This includes OSC, DMX, MIDI and the Leap Motion controller.

## OTHER

### Sculpture

I use the term 'sculpture' rather loosely in this dossier to describe 3D physical forms, rather than referring to sculpture as a branch of the visual arts. This is due to my lack of formal training in sculpture meaning it could be difficult to define the forms I create as 'art'. As I primarily work in digital media, I will need to take time to practice working with physical media as well, as they contribute to a large part of the project I have in mind. So far I have identified clay and foamboard as mediums I will like to explore. Foamboard especially as it is relatively easy to work with and is already white which is perfect for projection.

### Resolume

Resolume is a tool for life VJ-ing and creating audiovisual performances. I've had a little play with the software but much more will need to be learned about it if I intend to use it in the project. I am particularly interested in the wide range of effects and the ability to control parameters of these effects with audio fairly easily. It is also possible to use siphon to get the output into MadMapper which is very helpful for mapping the results.

### Glitch

There are various tools and processes commonly used to generate glitch content, such as editing hex data, datamoshing, databending etc. I have found various tutorials which I will follow to experiment with different methods of creating glitch content which is more like 'pure' glitch compared to that generated by an After Effects plugin.

# INITIAL TESTS

## Music EQ visualiser

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To jump in learning MadMapper and Quartz Composer I found a tutorial<sup>[1]</sup> to follow which involved creating a music EQ visualiser and then using that as an input into MadMapper and mapping it to something.

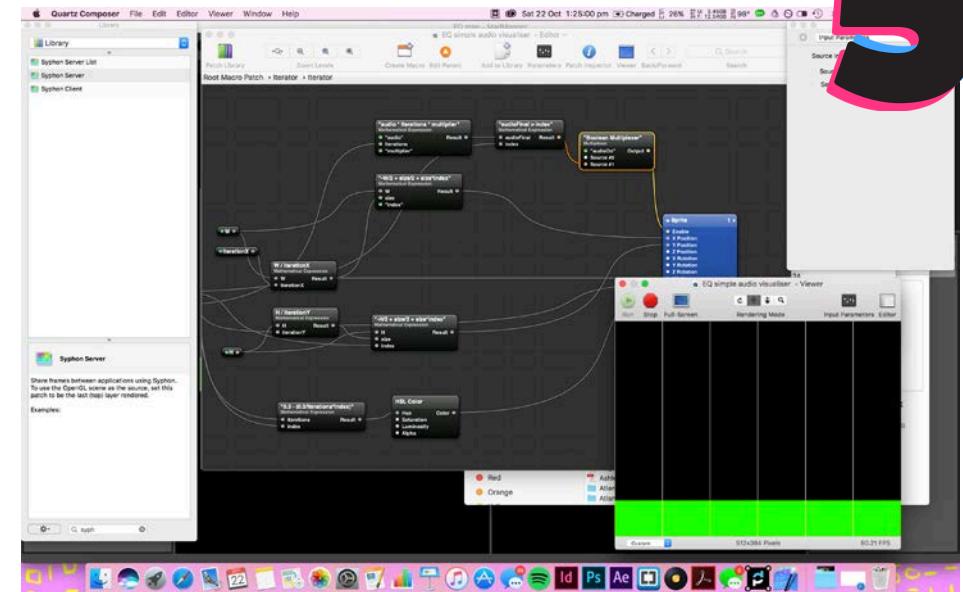
I started by creating a setup in my bedroom to project onto. This consisted of some cardboard boxes with white paper taped to them. The white made the boxes better surfaces to project onto as the brown cardboard absorbed too much of the light and made the image dimmer.



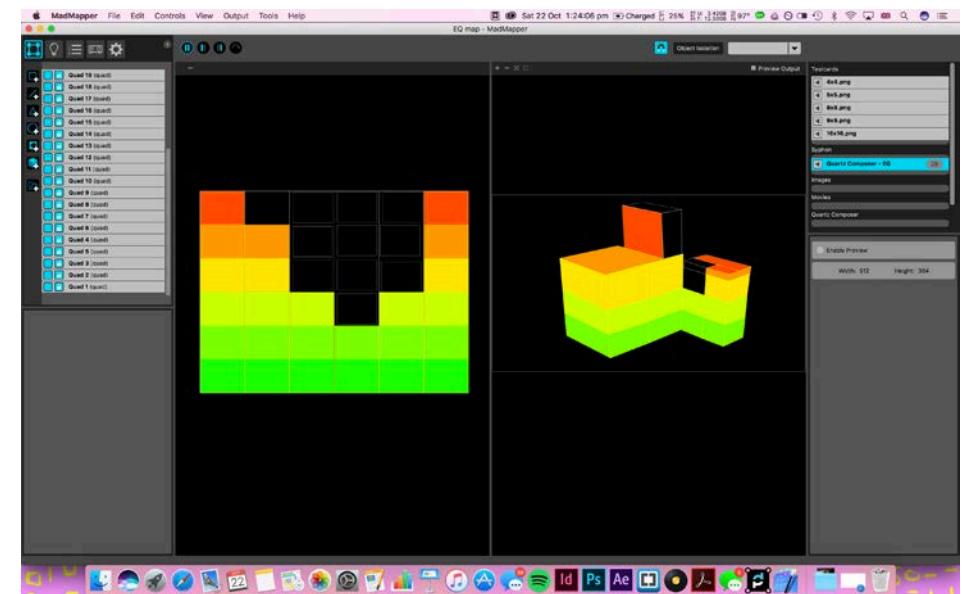
Projection setup with projector angled down at boxes

The Quartz composition created the coloured grid and used the input from the microphone to map the volume peaks at different frequency bands to control the appearance/ disappearance of the boxes. The output from this was then fed into MadMapper using Syphon.

Quads were drawn in MadMapper to fit over the boxes in my room. Each quad was then mapped to display a section of the EQ. The quads needed to be carefully placed as if the output from the projector doesn't line up with the physical shapes, the output will bleed onto the background and ruin the visual effect.



Quartz Composer file and output.

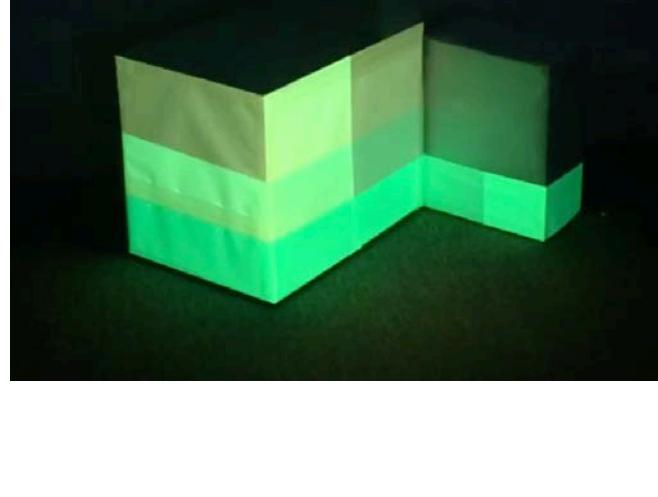
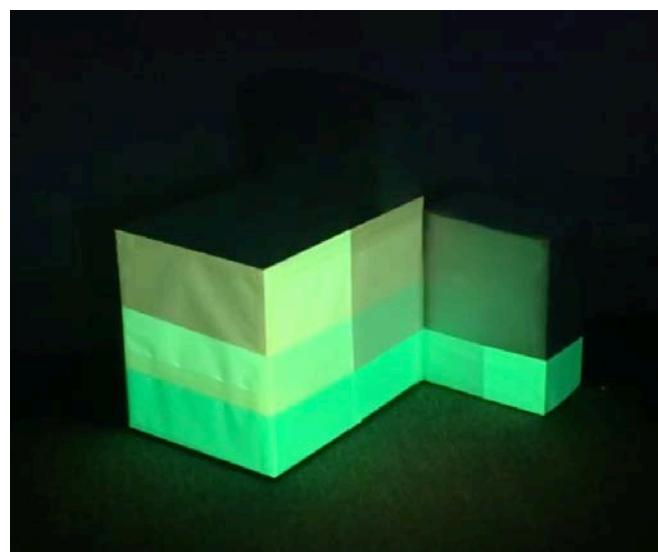
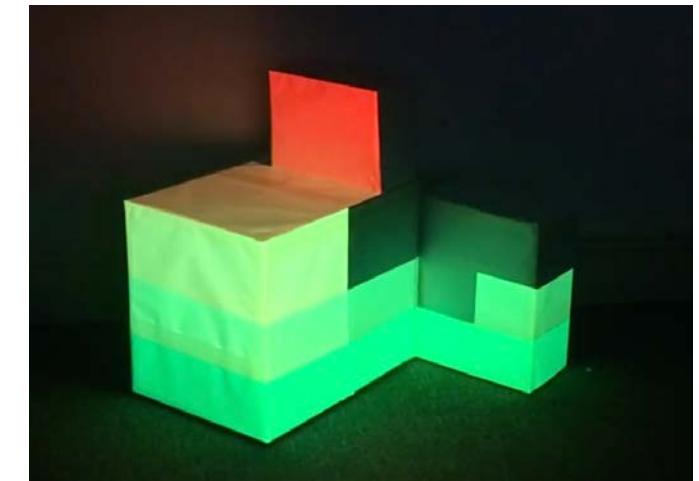
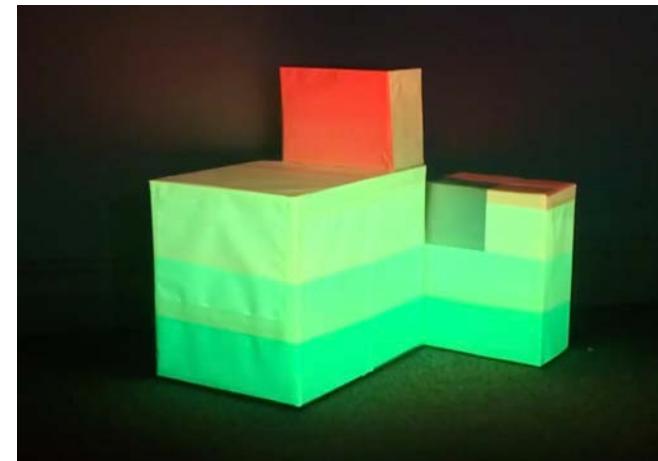


Screenshot from the EQ mapped in MadMapper onto the shape of the boxes

[1] - <https://l024d.wordpress.com/2011/07/04/madmapper-tutorial-turn-a-building-into-a-giant-equalizer/>

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Here are a few screenshots of it in action.



A video of the EQ visualiser in action can be found in the folder titled “I. Initial Test EQ”.

From this I have found that projection mapping requires a relatively dark space to work in. This is partly because bright lights can wash out the projection and make it appear faintly, and partly because the darkness hides the shapes being projected onto and makes the visual effect more appealing.

The shapes I had for this weren't ideal as there wasn't enough surfaces to properly map all of the volume levels, however for an initial test of the technology it isn't overly important.

Projection mapping is essentially a form of augmented reality, and it “consists of enriching, with the mediation and use of a computer, the human sensory perception with the addition of more information than that perceived by the observer.” (Maniello 2015, p. 15). This is an interesting type of augmented reality as the observer continues to interact with the physical space while acquiring additional information from the digital overlay.

# INITIAL TESTS

## Vaporwave content test

For this second test I also covered the floor with white paper to create another surface to project onto. This meant that the projector had to be raised higher and angled further down to get a large enough image on the wall and floor. Ideally for this kind mapping the projector would be ceiling mounted so that it can be positioned above the audience viewing point and let them get closer to the work.

To get an idea of how vaporwave aesthetic would appear when projected, I had a go at mapping a few of the random videos loops I have made over the past few months. The footage included a colour mapped video of a palm tree, an image of a nebula displaced and animated using Cinema4D, a video of some 3D cloth intersecting (also made in Cinema4D), a glitchy statue with the blue screen of death on it and a pink scrolling grid on the floor.

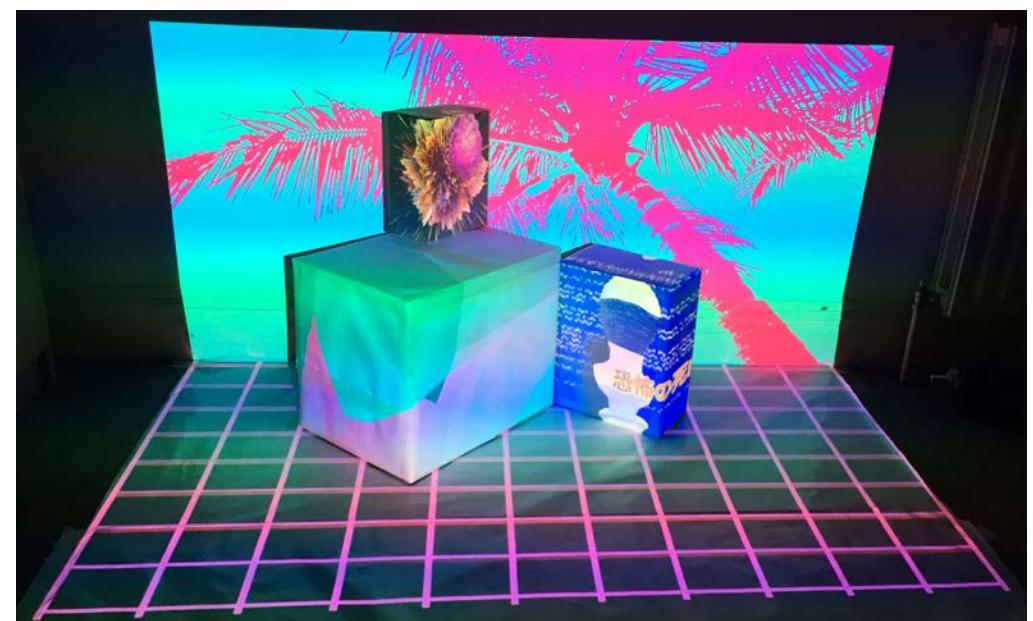


Updated projection setup

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Again, in a dimmed room, the colours came out much more vibrant than anticipated. The boxes were placed at angles to give more surfaces to project onto. While also projecting onto the wall behind however, there were shadows cast by the boxes and therefore areas where the video couldn't reach. This issue could be negated with the introduction of more projectors at alternate angles to provide more light sources, but that is outside the scope of this project and therefore consideration of these shadows will have to be made if the final project involves projecting onto objects and the wall behind.

A video of this test can be found in the folder titled "2. Initial Test Vaporwave"

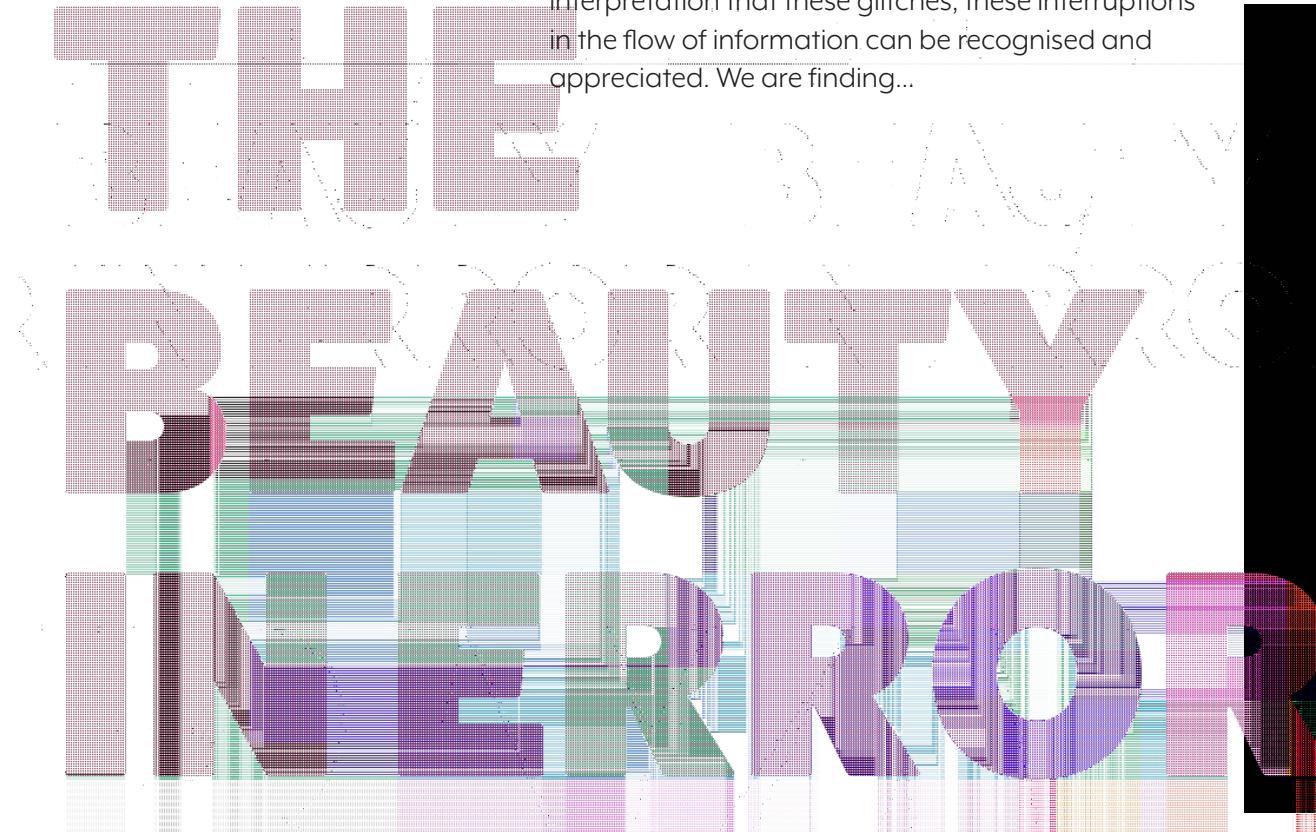


The projected footage into the physical space

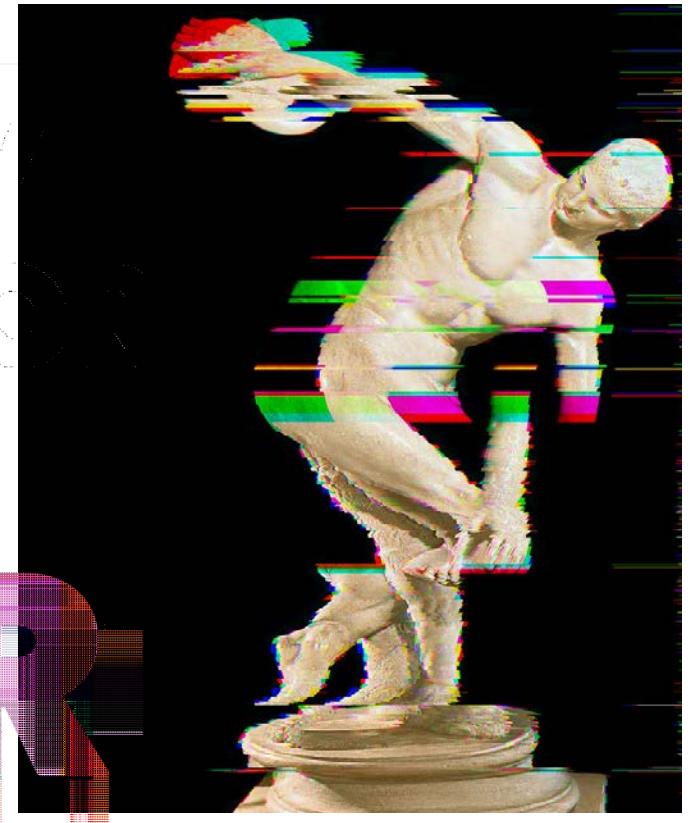
# GLITCH

After having trouble thinking of a direction to take this project, I stopped and thought about what made me interested in vaporwave aesthetic in the first place. One thing which really stands out for me is the glitch and distortion in the images and videos combined with classical sculpture which are prevalent within the aesthetic.

As a result of this, I am shifting my focus to exploring the relationship between classical (Ancient Greek) sculpture and glitch aesthetic.



Ancient Greek sculpture is concerned with proportion, poise, and the idealised perfection of the human form working with materials which require precision and mastery of skill (Cartwright 2013). This is contrasted with glitch art and the glitch aesthetic which valorises and celebrates (possibly simulated) computational error. It is a result of our increasingly intimate relationship with computer technology as it infiltrates and mediates so many aspects of human experience. And it is through human interaction and interpretation that these glitches, these interruptions in the flow of information can be recognised and appreciated. We are finding...



# GLITCH TESTS

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I took a picture placing my camera in front of the projector lens so to get an image of the bust from the projector's perspective. With this image I was able to cut out the statue (right) so that I could use it as a basis for projection.

I loaded the cut-out into After Effects and used a plugin from Trapcode Universe to generate the glitch effect. The plugin has a lot of control to customise the appearance of the glitch such as compression, displacement, colour distortions and more. The different effects can be used individually or combined and adjusted to create a countless outputs.

I made a few glitchy tests and mapped them onto the statue to get an idea of how it would appear and to inspire my next step.

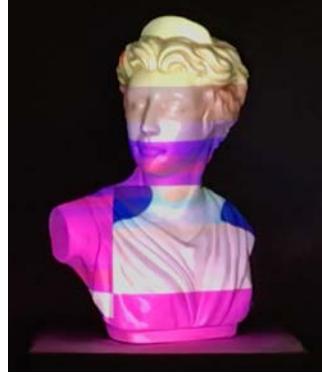


Cut-out used for making the effects



Projection setup in my studio (bedroom)





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Screenshots have been taken from short videos which can be found in the folder titled “3. Glitch Tests”

#### 1. (above) - Heavy glitch.

Continuous glitch aesthetic with very fast changing displacement and colour shifting. Looks very cool and eye catching but moves a bit too fast to fully take in and understand what is happening.



#### 2. (left) - Compression and lighter glitch

Compressed image, makes statue appear pixelated which is reminiscent of ideas within the New Aesthetic - digital artefacts and visual language bleeding into the physical world. There would be flickers of more glitch with colour distortion and displacement. While these weren't as bright and colourful as before they were surprising and caught you off guard, be it a little too frequently.



#### 3. (left) - VHS

This was made using a different plugin for After Effects to create VHS style distortions and glitches. The image quality is compressed (but not pixelated) and the colour channels are offset. There was also a rolling tracking line moving down the statue as if there was some physical damage on the VHS.

It was quite uncanny to see the familiar lo-fi aesthetic of VHS embodied in a physical space watching the statue flicker and distort as if it was a screen. Seeing this effect in person (rather than the screenshot) unveils some real potential for exploration.

For these projected images to be the most convincing and effective, it needs to be done in a relatively dark room. This allows the pieces of the statue not lit by the projector to effectively disappear and it makes the jumps and displacements far more uncanny and appealing.

It also needs to ideally be viewed from the front as it has a relatively narrow viewing angle to see the full effect. As the projection comes from a single point on the front, this is also the ideal position for the audience as the sides and back of the statue remain in the dark.



#### 4. (left)- Multi

This video features a series of 10 second tests of effects. The first two were made using a plugin to make them appear like holograms with pixelation and colour distortions. While somewhat interesting, I don't think the effect is as striking as some of the other glitches.



#### 5. (left)- Displacement

This video features purely flickers of displacement glitches. This effect works really well however in the example the glitches can be too fast and would should be slowed down to make it more effective visually. I like how it makes part of the statue effectively disappear in a dark room which is unlike any familiar experience of statues and other physical objects.



#### 6. (left)- Face ripple, 7. Rain

These are 2 different types of effects than before, experimenting with other possible distortions to the statue. The first features a ripple which begins on her nose and emanates outward, distorting the edges and making the statue appear wobbly. The second simulates the ripples from rain drops falling on the surface which has an interesting impact as it looks like a solid stone statue is rippling and made of liquid. These aren't glitch or the aesthetic I want to go for, but it was worth seeing them in action.



#### 7. (above) - Brick shatter

This was made using an effect which simulated a brick wall getting hit and shattering/ falling. The effect was applied to a still image of the statue mapped back onto itself and masked to keep the projection within the statue. The result was a great effect which makes the statue look like it just broke and fell apart into nothingness. Again, Not glitch but was cool to see nonetheless.

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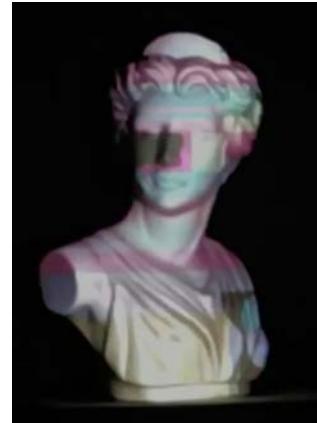


### 9. Leap Motion opacity

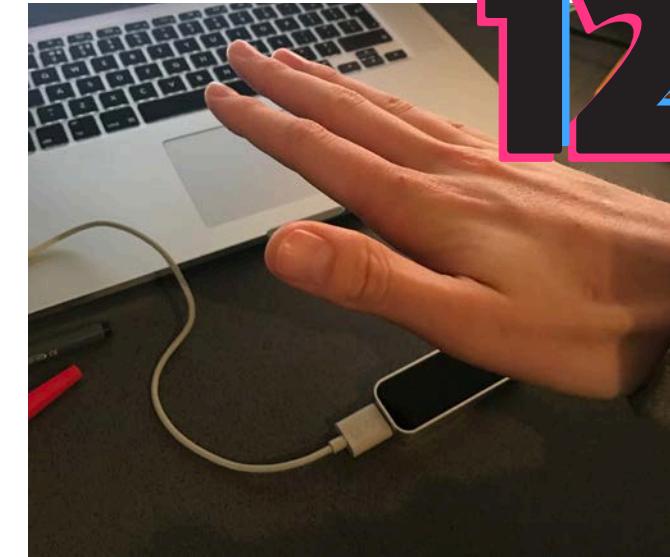
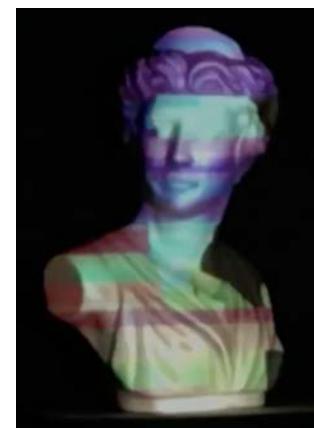
For this project I'd like to add an element of interactivity to the projection to give a sense of exploration and play when the project is exhibited. MadMapper has built in support for Midi controllers and the Leap



Motion controller which I used for this test. The projection setup had two layers; one of the statue undistorted and one with a glitched version of the statue playing on loop directly on top of the other layer. With the leap motion tracking a hand, the Y position in space was mapped to control the opacity of the glitch. As



the user raises and lowers their hand the appearance of the glitch comes and goes. While this is a very basic and boring interaction - both physically and visually - it stands as a good proof of concept for the possibility of adding an extra dimension to the project.



Given the nature of the Leap Motion controller, the interactions have to be quite confined and are limited to a single user as they interact with the small area of space above the controller. However there is scope to control more variables using a variety of movements and gestures which could potentially make the interactions more interesting and fun. This is something which will require future investigation and experimentation.

# INSPIRATION

## Projection mapping on statues

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### GOLEM x MBA (2015)

BK Digital Art Company

This projection mapping installation brings statues to life with subtle movements such as blinking eyes and flickers of light. The aim was to combine video and antic sculpture to create an uncanny feeling inspired by the lack of life inherent in digital imagery and classical sculptural art.



### GOLEM x APOLLO (2015)

Arnaud Pottier, BK Digital Art Company

A continuation of GOLEM, this project also aims to bring statues to life. It focuses on subtle interactions that allow the statue to gaze around the room. It is projected from underneath the sculpture's face making it appear shadowy and ominous. It suggests a possible near future of the experience of art.



### Starkers (2016)

Davy & Kristin McGuire

This audiovisual installation features a narrative which brings this statue to life and allows her to play dress up and communicate with her audience. It is a statement on the changing tastes of art, beauty and human form across the centuries. This installation also projects onto the rear wall to add further depth to the narrative.

From my research into existing sculptural projection mapping installations, there is a common theme of bringing motionless statues to life through this layer of virtuality. The audience also play a significant role in that they aim to alter the experience of the classical art pieces and introduce new interactions, making the experience more dialogical.

They focus on the human element of the sculptures and play with how lifelike they are as the sculptors managed to recreate intangibly qualities such as poise, mood, and grace (Cartwright 2013). All it takes is some subtle movements and interactions and they become almost like living people. The Starkers installation explores the relationship we hold with sculpture told from the perspective of the sculpture itself. The narrative discusses the fragility art and how her appearance is not a representation of a woman, rather a construction from many. It forces the audience to see the sculpture from a new perspective and think deeper about art and its meaning.



Recreation of a statue painted to show how it could've looked in the past.

Most, if not all, ancient Greek sculptures were once painted back in their era (Bonn-Muller 2008). We tend to think of these sculptures as being eternal white figures with soulless stares and an air of pure elegance but they were in fact brightly coloured and matched the aesthetic tastes of their time. The painting bought them to life, giving skin a healthy complexion, the eyes pupils and giving the clothes an essence of materiality.

I'm currently interested in how these sculptures are viewed today, and how they could be modified to fit in with the aesthetics of the digital age. Through projection, the two dimensional screen is able to embody a three dimensional space and is able to blanket 3D surfaces, merging the physical and digital while blurring the boundary between.

We encounter digital artefacts and glitches on a day-to-day basis but almost all of them are filtered out subconsciously. We have become so used to seeing compression artefacts and other glitches in many of our interactions that we cease to notice them.

In my grad project I'd like to bring attention to these glitches and force people to notice them. Through making this digital phenomenon physical, I'd like to explore reactions and interactions with these glitches as they seemingly distort physical sculptures and potentially other artistic creations.

It takes inspiration from the early 20th century Cubist and Dada movements and anti-art as it seeks to reject prior conceptions and attitudes concerned with how art should work. The movements were detached from reality and convention and ignored traditional aesthetics.

Inspiration also comes from looking at the Surrealist movement which developed out of Dadaism in the early 1920's. Surrealist works often feature the element of surprise and unexpected juxtapositions. This movement splits from Dada since artists reflect on the influence of the idea of the unconscious mind as art was created through performing actions without conscious thought or intention.

Here I think glitch follows on quite nicely and further explores the break from realism and focuses on the chaos and randomness of the unknown. While all of my tests aren't considered 'pure' or 'real' glitches in the sense that they're not accidental, or the result of computational error (Menkman, 2011, p.36), there is still validity in exploring the aesthetic of glitch and the impact it has on conceptions of traditional artistic experience and expectation.

In Ways of Seeing (1972), John Berger discusses how technology has changed our perception of the world and of art. Meaning has become transmittable, it has become information which can be broadcast around the world and viewed on a screen; it has become information. Paintings and sculptures become messages to be used and can be thrust into countless new contexts. However these reproductions distort. Reproduction has made the meaning of art ambiguous and it becomes a tool for talking allowing the art to take on new meanings in new situations. We are no longer forced to visit art galleries to experience art. We can purchase reproductions to place into the familiar context of our own lives.

Through these reproductions, glitches are powerful interruptions which shift an object away from its ordinary flow of information and towards the destruction of meaning (Menkman 2011). In this destruction, glitches can create voids which form a sort of counter-experience, a negative pleasure which isn't so different from the aesthetic concept of the sublime.

This is exactly what I've done. I have purchased a reproduction of a classical sculpture and intend to use it in the context of the graduate show. I am going to change the meaning of this sculpture firstly through placing it into this new context, and secondly through projection onto it to further customise and otherwise distort the message.

The intention here is to explore the meaning and experience of art and use glitch to distort, disrupt or otherwise subvert this experience and hopefully create new meaning and get the viewers to think differently about digital and physical art.



The Treachery of Images (1928-29) - René Magritte



Ceci n'est pas une glitch (2010) - the author

# INSPIRATION

## Antony Gormley

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I have been inspired by sculptors who's work looks at the human form in different ways. One such artist is Antony Gormley who's work explores the human body in relation to the world. For Gormley (2012), art isn't about objects for monetary exchange, its about reasserting our first hand experience in present time. He uses sculpture to explore the space that exists within us, and without us; the objectless, limitless, black space we experience when we close our eyes. His sculptures act as indexical registers of a lived moment of a body in time and explore the space created by this body.

I view his sculptures contrasted to those created in Ancient Greece. These classical sculptures set out to perfect the human body in its physical sense, recreating its appearance and presence. Gormley, however, largely disregards the exterior appearance of a person and focuses on the space within, a hollow space created by the exterior shell. Within this space he explores different shapes and forms. I am particularly interested in how this form is broken up and disrupted while still looking very human and imposing.

Glitches can be seen as visual manifestations of the inner workings of computers. When we experience a glitch, we are reminded of the medium itself as it is no longer transparent. Glitches allow us to find out so much more about the medium as it shows its usually hidden properties and characteristics.



Mean, 2016



Building 1-5, 2013



Aperture II, 2009

# INSPIRATION

## Alberto Giacometti

It has been suggested that I look at some of the sculptures by Giacometti, and their different approach to the human form compared to the realist approach of classical sculpture. Early on in his career, Giacometti was creating realist busts, but as time went on and his view of the world changed, as did his sculptural works as they become more abstract and figurative. He shifted to reduced, thin, elongated and fragile looking figures which raise the question: Why did he make them like this? How has his view changed to see the world in this way?

To Giacometti, nothing was ever satisfactorily finished and as a result he constantly reworked his sculptures often resulting in very thin figures due to his repeating carving. His works capture the post-war emotions that he, and likely many others were experiencing. The sculptures are a reaction to his feelings of melancholy, alienation and loneliness, and to the rest of the world as he struggled to find meaning. Giacometti's sculptures became an emotional responses to his subjects, not depicting them as they are seen but rather how he thinks they should be seen.

For me, it's the destruction and abstraction of the human form that really interests me, and how through reducing these figures to their core there is a sense of emotion and in a way makes them feel more human than usual realist sculpture.

His busts, such as Annette IV (1962, cast 1965), are

particularly interesting in relation to classical sculpture. The surfaces are heavily worked and deformed, instilling a rather harsh and cold emotion over the sculpture. There is clear evidence of the clay medium he would've worked in, with shapes caused by his hands working now eternalised and cast into bronze. The importance (for me) is not the subject being depicted, rather the process of creation, the dialogue with the materials, and how these materials add such depth and emotion through the way they were worked and moulded by the artist. The material properties of clay, its softness, the way it is manipulated, become as much a part, if not a more significant part than the subject for the bust. In contrast, taking Michelangelo's David (1501-1504) as an example, the different focus is instantly clear. Here the focus is the subject, the figure being depicted and immortalised in marble. The marble had been worked in such a way as to hide all evidence of the medium itself, heading towards almost uncanny perfection in recreating and representing the human form. Even the textures present in the marble, the slight blemishes are reminiscent of the blemishes on human skin.

In terms of computers and the digital, advances in technology are leading to ever more seamless interactions, as we begin to forget or even fail to notice the computer mediating the experience. I'd like to move away from this transparency and bring awareness of the medium back into the foreground. Glitch art glorifies the noise and errors that interrupt the seamless transition of information, shifting the focus to the fleeting moments in which the medium and all its glory presents itself to us.



Annette IV, 1962, cast 1965 by Alberto Giacometti



David, 1501-1504 by Michelangelo

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# INTERACTIVITY

## Further Leap Motion tests

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At the end of my glitch tests, I did a quick test using the Leap Motion to control the opacity of a layer in MadMapper as a way of adding interactivity. I decided to explore other potential interactions using the Leap Motion. Videos of these in action can be found in the folder “4. Interactivity Tests”.



### 1. Eyes and mouth

While this one isn't actually using the Leap Motion, I felt it was still worth including. I recorded a short video of my face as I stared into the camera, occasionally looking around. I then cut out my eyes and mouth and mapped them onto the statue. I also created an image which gave the statue some colour to bring it to life. This idea was inspired by the GOLEM works. One possibility of this would be to use face tracking on a viewer and map their eyes and mouth onto the statue as they look at it. However some thought would be needed to consider how the glitch aspect of my idea would be involved.



### 2. 3D color

Here I mapped the 3D space (X, Y and Z) above the Leap Motion to control the red, green and blue values on the projection. The original image was a pure white mask of the statue. As the interactor moved their hand around and explored the space, the colour of the statue also changed, tracking their motion and translating it into a multitude of colours. I enjoyed this one as it has a good sense of discovery with it, as you move your hand around trying to understand what exactly is happening.

### 3. Speed

I used a previous fast moving glitch video mapped onto the sculpture and the Y position (height) of the interactor's hand was used to control the playback speed of the video, from 0% to 200%, and explore the impact that speed has on the experience.

### 4. Seek

This time I used the X position (left and right) of the hand to ‘seek’ in the video. When there is no interaction, the video is still but once a hand begins to move left and right, they explore the video and uncover glitches and distortions on the statue.

### 5. Gestures

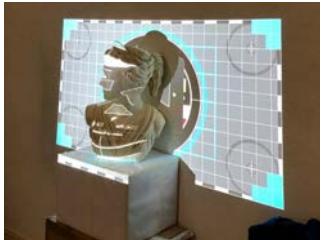
Leap Motion and MadMapper have some built in support to recognise gestures. Here I used a clockwise circle motion to trigger a glitch video to play, then a swipe down gesture to make the video pause. While there might be some use for gestures, I feel that the audience will need to be shown or told how to interact with it as the gestures are more complex than just waving your hand about.

Overall I think there is definite potential for adding interactivity using the Leap Motion but they will need work to make them more engaging and intuitive. I'd like to add a sense of exploration and discovery as the audience encounter these glitches and begin to view them in a new light.

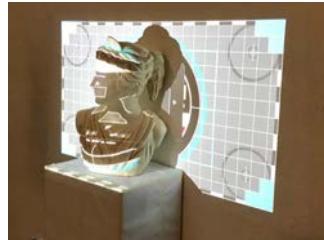
# PROJECTION

## Findings about projection mapping

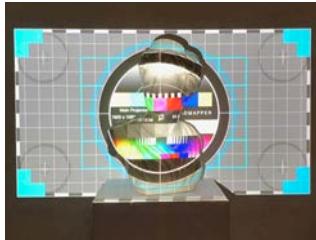
19



Before Keystoning



After Keystoning



Front view of corrected result

Between doing tests on different days, my projector is usually moved as it is usually positioned in the middle of my room/ makeshift studio when I do projection experiments. As I've had to set up my projection studio multiple times, it has given me a better understanding of the process involved with the setup of the project and has given me some insights which have sped up this prototyping process.



First is positioning the projector, and using keystone correction (or keystoning) in order to skew the output image and make it back into a rectangle when projecting into spaces which are not horizontally perpendicular to the projector. Using MadMapper it is not essential to keystone correct the projector as it already allows you to skew and distort the output. However keystoning is an essential task in order to make scenes reusable and reduce set up times. Now when I move the projector back into place, I just need to put it in the same general area as before and it doesn't have to be perfectly positioned. This means that previous MadMapper setups can be used with only minor adjustments and corrections.

When making glitch content, I have been using an image which was taken from the perspective of the projector so it maps (almost) perfectly back onto the statue. The keystone corrected projection makes this possible. One other consideration which needs to be made is the position of the statue itself in relation to the projector. Each time I've done these tests, the projector is directly in front of the statue. As light can only travel in straight

lines, when the light from the projector goes onto the statue it casts certain shadows as the light is blocked by parts of it. With a single projector set-up these shadows can't be avoided. The best that can be done is placing the projector in a position which minimises shadows dependant on the shape of the object. Because I want to use the same glitched content I have generated, the projector and sculpture need to be relatively in the same position each time. While there is slightly more discrepancy as to where the projector goes, the sculpture needs to be at the same angle each time. My solution to this is rather simple; I drew around the base of the bust on the box it is standing on. This allows me to easily place the statue back in the same place each time I move it.



Once everything has been positioned, the next step takes place in MadMapper. I have a version of my reference image which I have adjusted the levels to accentuate the shadows. I use this to make it a bit easier to line up the projection onto the statue as I scale and position the image. While this is usually a very close fit, it's by no means perfect.

There is often bleed off the side of the statue (as the projection goes onto the wall behind) and occasionally some of the details aren't perfectly aligned. To negate this, MadMapper provides two solutions; masking and mesh-warping. Masking is essential to ensure that the projection stays on the sculpture. Any video content that

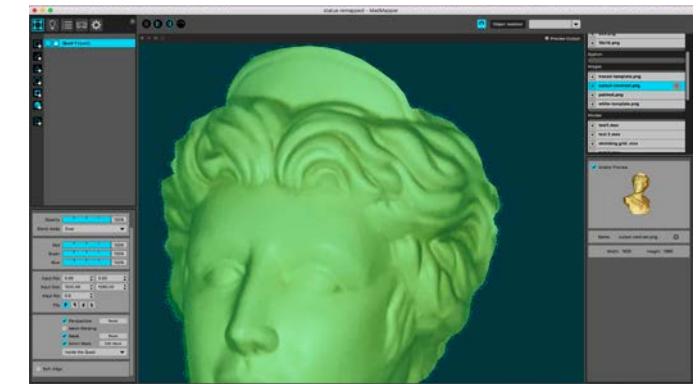
goes beyond the mask doesn't get projected and therefore can't bleed onto the wall behind. For this I have found that the fastest method is to first load in the high contrast image of the sculpture and use this as a template to draw the mask around the edge of the image. The mask is formed of a series of points which can be adjusted and moved after it has been made allowing me to perfectly control its position. Mesh warping is a more subtle effect and is suitable for minor adjustments. The statue itself has some significant shapes in the hair, on the face and on the clothes. Once I have lined up everything the best I can, not all key shapes within the statue are aligned. Mesh warping allows me to manipulate the image and bend/warp it so that it fits onto the sculpture. Using the same high contrast image, I warp and bend it so that significant points are better aligned. The image and videos have all been made to be 1920px by 1080px. This is so that when they are loaded into MadMapper, the position on the input layer and the position of the mask and mesh warping is always the same. This allows me to quickly change between clips using the exact same mask and mesh warp each time.

One issue which I have had while projecting in my bedroom is that the floor isn't very stable and moves slightly as I walk around. This causes the projector to also move and occasionally causes bleed. Given my current setup this isn't really an issue I can avoid and I am sure that whatever space we have for the graduate show will have sturdier floors. Another point I have considered is the position of the projector itself. At the moment I have it on a stand on the floor in front of the statue, as I have no other means of mounting the projector. Ideally I'd like to have

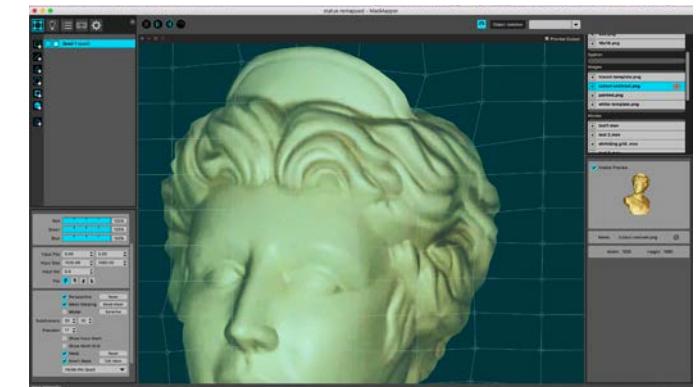
it mounted from the ceiling. This opens up the floor space in front of the statue and allows the audience to enter it. This is something that will need to be discussed with the University beforehand and I will need to experiment with it to get a better idea of how it will look etc. As it won't be projecting from directly in front, the shadows on the sculpture will differ and new content may need to be generated depending on the position of the projector in relation to the sculpture.



Example of bleed when projecting onto statue.

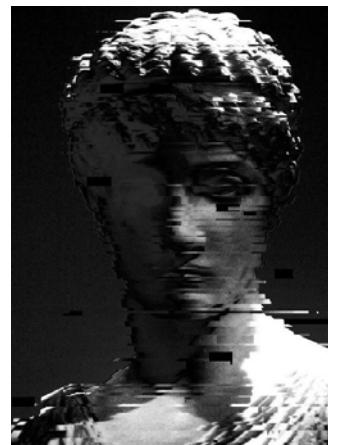
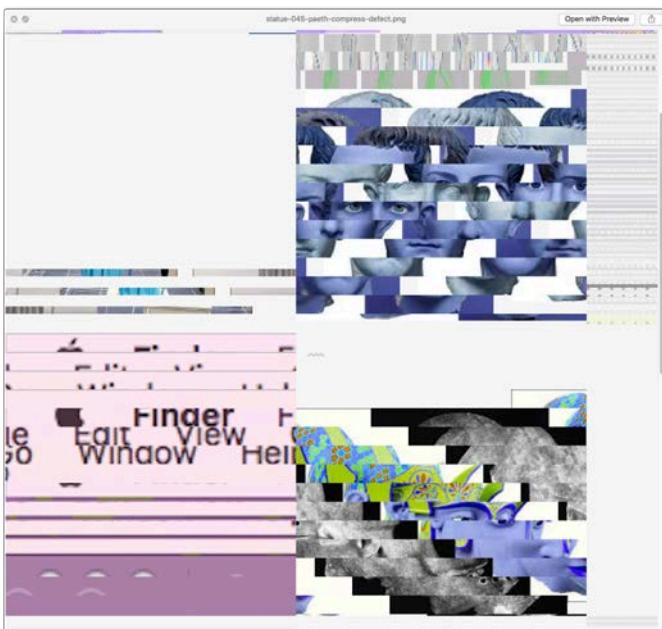


Masking in MadMapper to hide overflow/ bleed



Mesh-warp in MadMapper to better fit the statue

# MOODBOARD 2.0



# NEW FOCUS

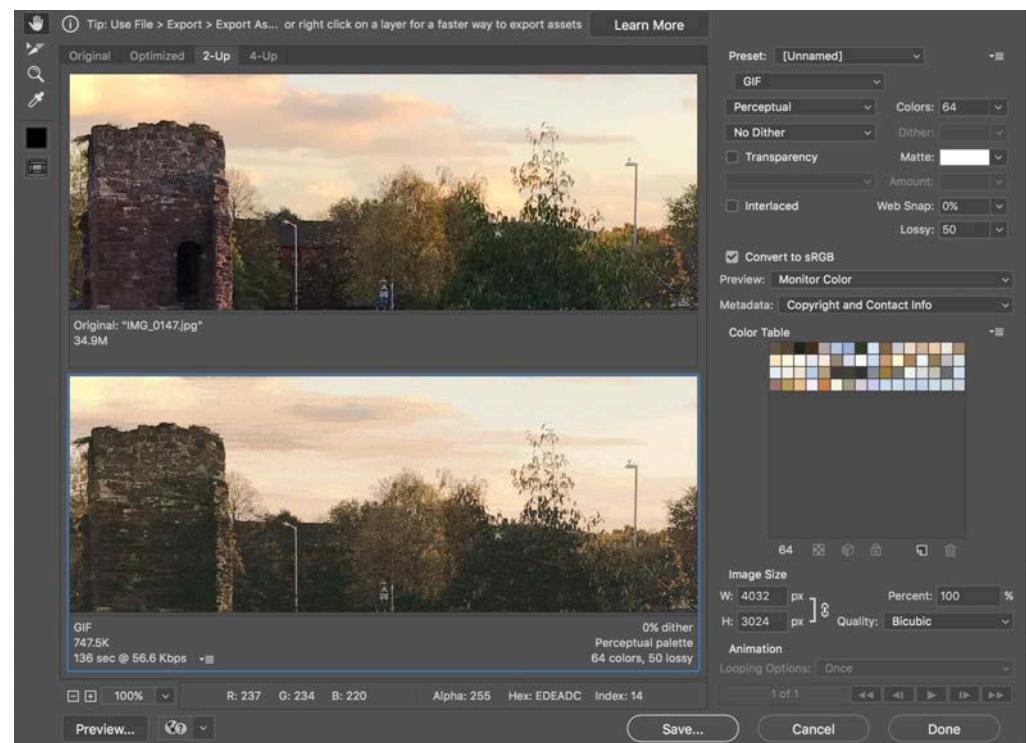
## The nature of media and glitch

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In the same way that original editing techniques emerge out of the physical nature of film and photography, and how we interact and engage with these media, contemporary glitch art emerges out of the nature and technical limitations of the digital medium itself.

Glitch art has a rather long history and it mostly stems from artists playing and experimenting with their mediums. It represents a shift from focusing on representations of reality and moving towards more abstract and different ways of thinking and seeing. It involves an awareness of the materials and tools which mediate our experience be it canvas and paint, celluloid camera film or circuit-boards and LCD displays. Artists push the boundaries of their media to find out more about their limitations and characteristics. In the same way a painter can experiment with different types of paint to learn more about their texture, colour, smell etc, a digital artist can, for example, experiment with different compression algorithms for their images and video, resulting in varied aesthetics as the data is encoded to use fewer bits than the original representation. The overall image could still be the same, lets say a picture of a tree, but as different paints will give different textures and depths to the colours of the tree, as will varying degrees of compression change the colours and appearance of the tree.

I find glitches interesting in the way that they disrupt convention and expectation. Glitches break up the expected flows of information and meaning that make us aware of the medium and the impact it is having on the message. Interestingly, with the pervasiveness of computing technology, we are becoming less and less aware of these glitches and digital artefacts. We encounter them so often that we stop noticing them and they just become part of the experience we expect. For example, whenever I use Facebook and go to a page other than the homepage, the name of the page appears in the search bar (as it should). However on safari, this text always ends up overlaying the 'Search Facebook' placeholder text that usually inhabits that box. While this is a rather small, and visually uninteresting glitch, its interesting how I just stopped caring about and noticing it. Only since becoming more interested in glitches that I actually enjoy seeing it now, especially as I don't encounter the issue in any other web browser.



Example of GIF compression in Photoshop. There are a lot of variables to choose from including limiting colours, palette selection, dithering and lossy-ness. Changing these variables can drastically alter the appearance of the image while reducing data and file size.



Facebook search bar glitch

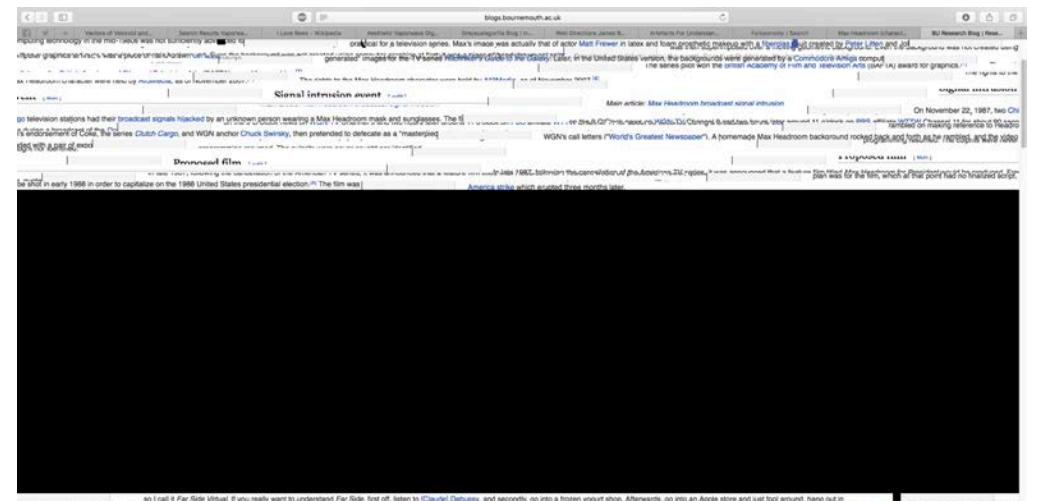
Glitches can come in a wide variety of forms. For the purposes of this project, I consider Menkman's (2011) interpretation of glitch; actual or simulated breaks from expected or conventional flow of information or meaning within communication perceived as an accident or error, to be my starting point. Here, glitch doesn't always have to be the result of 'bad' data or technological error, it is an aesthetic which occurs when flow is interrupted and the medium shows itself. In this sense, when Modernist sculptors and painters started representing reality in a new, abstract way, they were in a sense glitching it, interrupting the traditional flow of representation and meaning to create new and exciting forms and visualisations, new perspectives and new messages from the same source.

It is worth mentioning that as we interact with computers and machines, we only really encounter visual glitches and errors as we only experience the visual output of the computer's efforts. If glitch is seen as introducing 'bad' data to break an image for example, if the image still loads and can be viewed, the data isn't bad at all. From the computer's perspective the data is still good and can be read and opened, however from the human perspective the image becomes broken and distorted as it no longer represents what we expected. These broken representations are the manifestations of computational error. A process that is usually hidden inside a magical computer box shows itself to the world, often in strange and beautiful ways. It becomes almost a collaboration with the machine. As we give it our images and representations to store, it mediates these images and transforms the message into bits of data it can understand. This data is then reinterpreted and displayed in a way humans understand. Introducing glitches on purpose becomes a way of subverting audience expectation and breaking the conventional flow we have built our lives around.

It could be argued that if the data is so broken that the image can no longer be opened and viewed, this lack of representation is the manifestation of the glitch. It is representative of how the message has become so broken and distorted that it is unintelligible. Glitch art relies on finding the right moment, the right level of distortion as an object shifts towards the ruins of deconstructed meaning. With tools that commodify the glitch aesthetic, this has become increasingly possible making the aesthetic open to far more in-depth exploration.



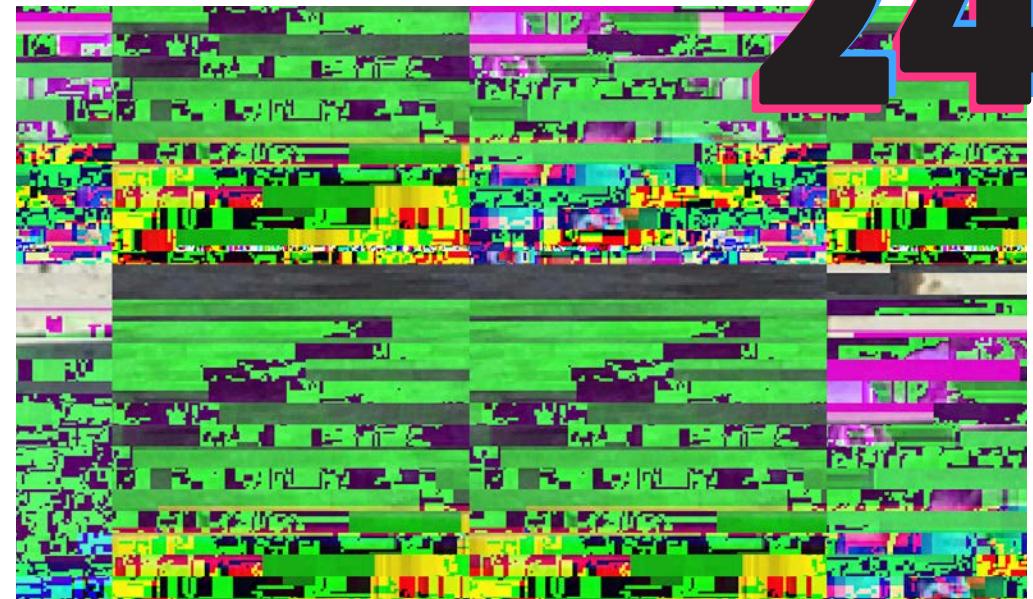
Glitched Vimeo video - I encountered this while I was changing tabs in Safari causing the video placeholder to merge with slithers of open tabs. My favourite part of this is the 'FUCK FUCK FUCK' in the middle right as it looks like my computer is screaming out in pain as I have so many windows open, and this is how it is manifested.



Glitched Safari - Another encounter from changing tabs in Safari. It seems that this browser struggles with having lots of tabs open and occasional mashes together data from each of them.

Marshall McLuhan (1964) introduces the idea that the medium is the message. He suggests that the medium embeds itself in the message it is transmitting and therefore influences how the message is perceived. Glitches trigger people to reflect upon their conventional frames of reference for the medium they are encountering, causing them to recognise the medium's presence in the message and fulfils what McLuhan suggested.

Glitch art is the emergence of an aesthetic from the physical limitations and capabilities of the medium in which it arises. Nowadays people look at early photographs and revel in the fact that they are black and white, and admire the grain which overlays the image. The grain, like a glitch, is as much a part of the experience of that photo as its subject, though it likely wasn't what the photographer wanted to represent through his photograph. Digital glitches emerge out of our interactions with computers and their technical limitations. For example, transmitting images over the internet introduces the possibility of error and glitch as data can be lost due to limited bandwidth or connection issues. These limitations alter the image and become a part of the aesthetic. Due to its proliferation we've come to accept this aesthetic as being part of the nature of digital media.



So after a long ramble, I've come to the point I've been trying explore through my experiments and would like to explore in more detail as the project progresses.

**Why put these glitches into the environment and make them physical?**

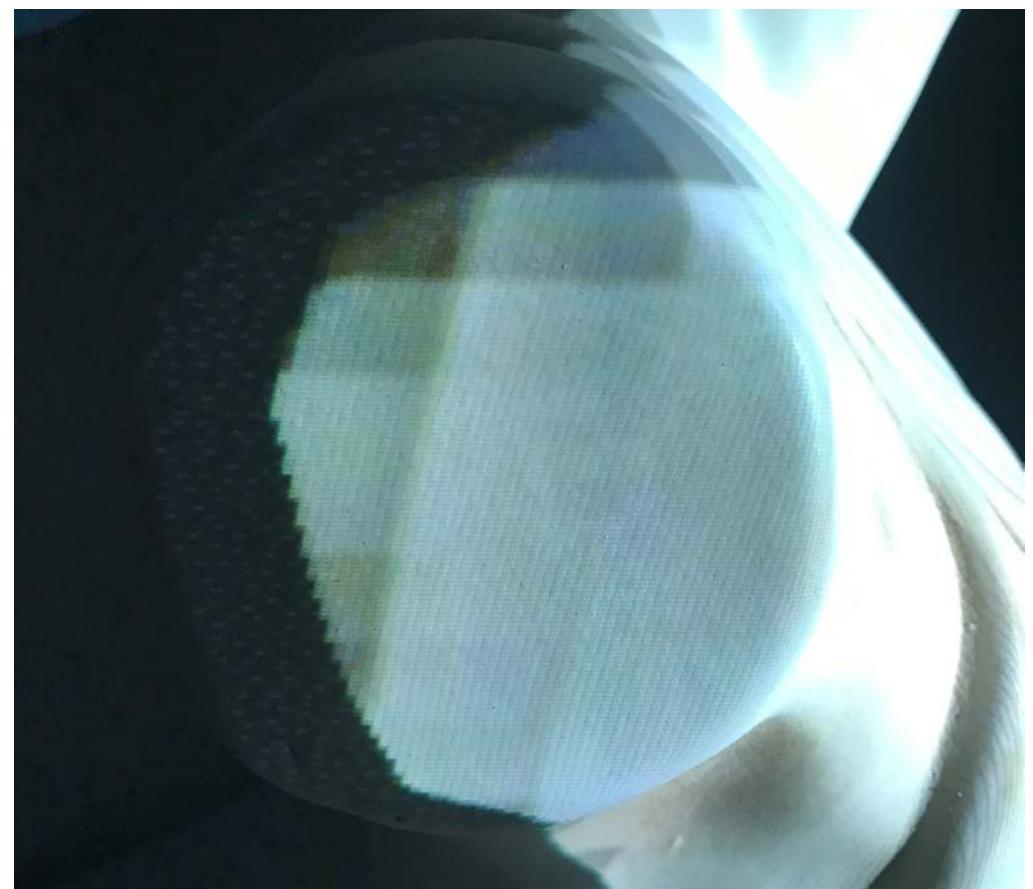
Due to the immaterial nature of the digital, it can be difficult to understand how these glitches and the digital aesthetic arises out of the limitations of the medium. **How do these distortions, these colour shifts, the fragmentation, the compression, actually emerge from the media?** Making these glitches physical allows for a deeper interpretation and understanding, that cannot be found while staring at them on the screen. It brings the glitches out of the digital world and into the physical world we understand as we've lived in it our entire lives.

My project will be an exploration of media, and how glitch works when projected onto physical forms. I'd like to produce a series of tests and experiments as I play with different forms and glitch aesthetics and explore the capabilities and limitations of the media and to get a better sense of the presence and impact of glitch in a way that can't be done remaining in the digital world.

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After writing this section, I realised that I had spent the whole time looking at the glitch from the front, the intended viewing angle. Going in for a closer look revealed the interesting boundary between the projection and the side of the sculpture hidden in shadow. Seeing the traditionally straight grid lines of the individual pixels curved around the 3D form of the bust was an interesting new perspective on the work I had been doing, and something that is completely hidden when viewing from a distance. Getting a closer look also revealed the jagged edges created by the masking tool in MadMapper as I shaped it to stop the projection bleeding onto the wall behind. Here is evidence of the medium embedding itself into the message. It's not just the digital medium and glitch art being explored here, but also projection, and the mapping tools.



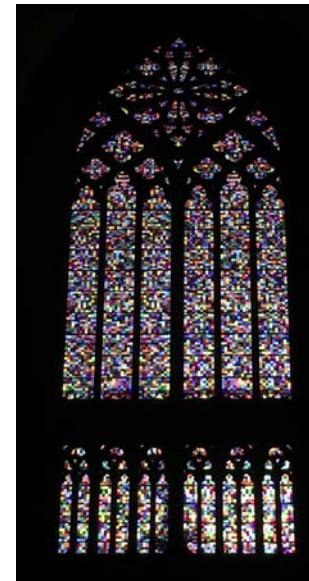
# NEW AESTHETIC

## A machine's way of seeing

The New Aesthetic is a term coined by James Bridle in 2008. He used it to describe a recurring phenomenon he had noticed related to a machine's way of seeing, and seeing manifestations of the digital in the real world. It is concerned with the complex relationship humans have with network technology and the effect it is having on our perception and understanding of the physical world around us.

Bridle started collecting images and videos of things he has seen which feature a style, an aesthetic that doesn't necessarily exist in the real world. This is things like pixelation, Google maps and street-view, and satellite imagery to name a few. These are all different ways of seeing which didn't exist in the pre-digital age, ways of seeing which come purely from our interactions with networks and computers and they've come to infiltrate many other aspects of our lives. For these images we should not worry about what they look like, but focus on how they came to be and what they become; the processes of capture, storage and distribution (Bridle 2013). The actions of filters, algorithms, codecs, compression, transfer protocols, databases, servers, satellites, all become encoded into these objects and alter our comprehension of them in ways we might not realise.

Glitch is one of the key manifestations of the New Aesthetic both on a conceptual and aesthetic level and is a result of the attitude which drives it (Contreras-Kotterbay and Mirocha 2016). As computation gets faster, pixels get smaller and everything becomes high definition, technology is increasingly becoming harder to notice and recognise, at it attempts to blend in with reality and hide its mediation. As a result of this we are seeing an increased foregrounding of representations of the digital across art and design to increase awareness once again. "Just as digital technologies and software mediate our experience and engagement with the world, often invisibly, so the 'digital' and 'software' is itself mediated and made visible through the representational forms of pixelation and glitch." (Berry et al. 2012, p.43). In this sense, glitches act as opportunities for us to reconsider the implications of digital imagery and they provide insight into how they come to be and the technology which facilitates them.



A pixelated stained glass window at Cologne Cathedral by Gerhard Richter



Glitch aesthetics give us a new perspective on digital media and go beyond the pre-programmed aesthetics and interactions which accompany the usual flow of information and data. Glitches, and the New Aesthetic force you to see the 'grain of computation' in everyday interaction in both the digital and physical world (Jones 2011). This 'grain' is the aesthetic tropes of the digital as they are manifested through things such as pixelation and the limitations of the digital become apparent through visual glitches and distortions. They provide us with a critique of the medium itself as they show it in a critical state (Menkman 2010) and forefront the hidden boundaries created by the affordances of the digital medium allowing us to examine their social and cultural impact.

# GLITCH TEST

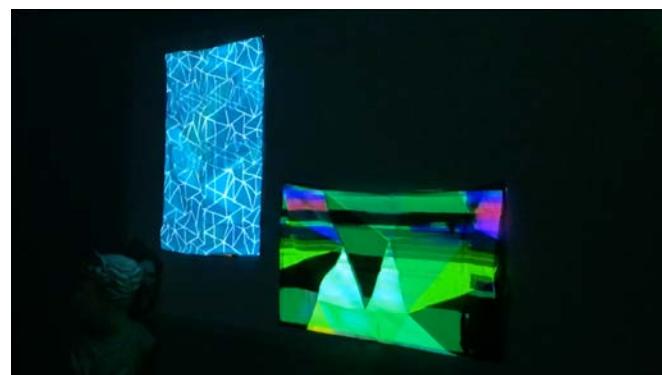
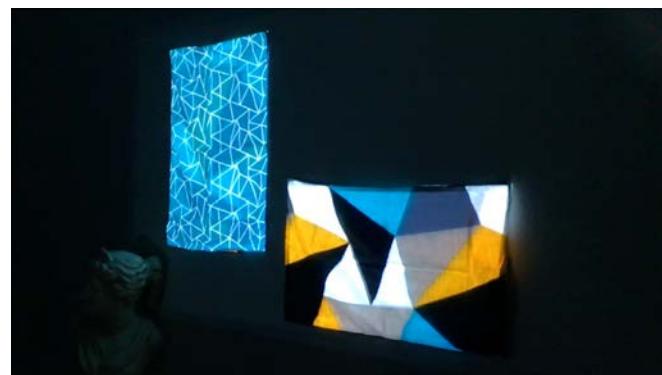
## Glitching pillow cases

Videos of this test can be found in the folder titled “4. Glitched Pillow Cases”.

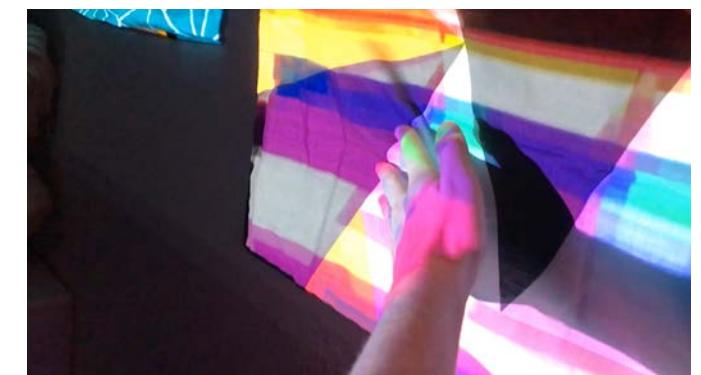
As most of my tests have been centred around using the bust for exploring glitch, I had disregarded other shapes and materials to explore the effects of glitch. As a result I wanted to explore and try something different. For this I used the pillow cases from my duvet set as they have interesting geometric patterns on which I hoped would create some good looking results. The patterns were also reminiscent of the polygon shapes of 3D models, which is another aspect of the New Aesthetic and the machine way of seeing. I stuck them to my wall and took pictures of them so I had a source image to glitch and project back onto them.

On one pillow I just used displacement glitches, causing parts of the pillow case to shift or disappear, and on the other I had some more complex glitching and some compression to cause pixelation on the shapes. For both of these I had an approximately 40% glitch rate so that there were times when the images were still. These were still quite short as it was only a 10 second test video but the effect could still be seen. Again, using MadMapper I mapped the content onto the cases and used the mask and mesh-warp tools to correctly align them.

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The end result came out far better than I was expecting. While looking at them, it was difficult to see what was real and what wasn't as the cloth flickered and distorted like a broken television. The slight waves in the cloth material made the glitch look unlike anything I had seen before, as I am so used to seeing them on flat screens. For some unknown reason, It made me want to touch the projection, and find out what was real and what wasn't - despite knowing full well what was as I made it. Bringing the glitch into the physical world evokes a more tactile experience, to try and understand what's happening by using another of my senses. This is an idea that I could possibly use in my project, adding an element of tactile exploration as the audience could interact with the piece and experience it in a more meaningful way. However there are some obvious issues here in regards to the interactors blocking the projector and them unintentionally moving the sculpture so that it is no longer aligned with the projection.



# GLITCH IRL

## Glitch art products and installations



The Indivisible (Prototype No. 1) (2015) by Normichi Hirakawa. A wall installation which explores whether it is possible for human beings to deal with principles and natural law underlying the world which natural science has been aiming to succeed in solving (Bors 2015).



Reconstruction (2016) by Wanbli Gamache. A video installation that takes elements of a particular environment and positions them to create an assemblage of narratives and abstraction (Gamache 2016).

To contextualise my work, I looked online to find contemporary examples of how glitch art has been physicalised and placed in real life (IRL, the physical world) as things such as installations and products.

To my surprise, while I could find examples of glitched products, such as the Good Vibrations series by Ferucio Laviani, or the Glitch 2.0 playing card by Soleil Zumbrunn, it was difficult to find installations which involved glitch art, particularly ones with projection.

I was looking to find other works where artists had combined glitch art and the glitch aesthetic with physical sculpture to explore the aesthetics and the mediums which afford them, but couldn't find anything similar. One that I did find particularly interesting (and somewhat similar) was a series of images by Jamie Boulton which he called Glitch Body Art. Here he used the human body as a canvas for projecting glitch on to. However my idea differs in that it will be an exploration of 'glitch' in both the physical and digital, with a focus of the dialogue between the two as they blur into each other.



Blue, Pink, Black (2013) by Margo Wolowiec. Polyester & cotton fabric printed with sublimation ink.



Glitch Body Art (2013) Jamie Boulton



Glitch 2.0 Playing Cards (2015) by Soleil Zumbrunn



Good Vibrations (2014) by Ferucio Lavani

# TRIPTYCH

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Sagrada Familia con ángel músico, Santa Catalina de Alejandría, Santa Bárbara (1510-1520) by Master of Frankfurt

All of my experiments involved glitching a singular form and viewing the different glitches one after the other. I found this very limiting as there is such a wide variety of forms and glitches which are worthy of exploration. This has inspired to aim to present my work in the exhibition as a triptych. Triptychs have roots in early religious artworks and were formed of three complimentary panels which usually depict three parts of the same or related scenes with a sense of flow between each part.

A similar idea is presented in Building 1-5 (2013) by Antony Gormley which I seem to keep talking about in this dossier. It is presented as a pentaptych (like a triptych but five components) and show the linear progression of form from minimal to more maximal approaches to the human form but sticking with a singular idea. Each sculpture in the work would function on its own to present an idea, but when presented together it unveils a new sense of narrative as the context provided by the similar works shows the evolution and exploration of and idea and of form.

This idea of flow is what makes the triptych so appealing to be as it allows me to present a narrative about the exploratory process and the dialogue between physical and digital media. It will allow me to exhibit three projection mapped and glitched forms in a way where each informs the others and they are seen collectively contributing to a whole. My current thinking is that I'd like each panel, each form of the triptych to present a different idea about the nature of media, each contributing to a singular discussion about this nature and the role glitch has in it.

# ANTONY GORMLEY

## Reinterpretation of works

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Building 1-5 (2013) by Antony Gormley

Since coming up with a better idea of the direction I want to go for my project, I've had a deeper look into Gormley's works as they seem increasingly relevant. Before, I wrote about Gormley's conceptual approach in exploring the space created by the body rather than the body as an object. While this is an interesting point, I've now been looking more closely at the form itself; how the fragmented shapes and structures are used to build this space and explore its limitations.

Building 1-5 (2013) is a great example of this. As a series of works it explores the same form using different fragments and building blocks, using increasingly larger/filled blocks each time, resulting in some glitchy and fragmented looking

shapes. The blocks act like physical pixels and the varied placement and gaps between them act as glitches or distortions, fragmenting the sculpture creating some very interesting results.

This is an idea I'd like to explore, creating Gormley style sculptures and then using these as the basis for projected glitch. In my previous experiments I've been using a bust of Aphrodite, and the glitchy result is purely that of the projection. In my process of making digital glitch aesthetics physical, it only seems fitting to experiment with 'glitching' the physical part itself, as well as the digital. The exploration could involve trying different shapes and forms to see how they interact with the projection then presenting them in a similar format to Building 1-5 as complimentary works.

In a short video, Gormley (White Cube 2011) discusses the importance of the studio as a place of collective creativity, a laboratory, a playground and a place to explore. There is significance in the process of working on something that isn't necessary in order to understand ourselves and understand the world around us. He talks about the revelation he had about the process. He realised that artist doesn't make the work, the work makes them, the work is in charge. The process involves listening carefully to what the work is trying to tell us, which will make the next step very clear.

To me, this makes it clear the importance of working in dialogue with the materials rather than trying to command them. It suggests an iterative process of play and experimentation to allow new ideas and thoughts to be revealed to find out more about the self, the sculpture, the medium and a whole range of other external influences which are being imposed. As such, to unleash the full potential of this project I'd like to take inspiration from Gormley's process of collaborative play and experimentation to explore both glitched sculptural forms and digital glitches themselves as they are created and projected back onto the sculptures - allowing a conversation not only between myself and the materials, but the digital and physical as the boundary between the two becomes blurred.

# GORMLEY TEST

## 2.5D Gormley inspired glitch projection

After coming up with a better sense of direction, I wanted to attempt a Gormley inspired projection before finishing. In the interest of time, the physical form is only 2.5D rather than a more complex 3D structure. It is made of layered foam board rectangles giving a slight sense of depth and a bit of shadowing, but definitely not the full effect. Initially I intended to make a small scale 3D model, but as I began to cut the foam board to form the blocks, I quickly realised just how long this process would take. Having found this out, it is definitely something to consider in my time planning.

The form itself was inspired by the shape of a bust with reference to Gormley's rather blockier constructed sculptures as they look quite pixelated and glitchy already making for a good starting point for experimenting with.

After creating the form, I took to Photoshop to create a digital version of it which I could use to glitch and project back. I made two versions to glitch; one which was solid white and one with each 'block' randomly coloured so that they could be individually recognised. The intention here was to see the effect colour would have compared to the purely white version when the glitch was projected. I then took them into After Effects to generate some different style glitches to review and compare the results.

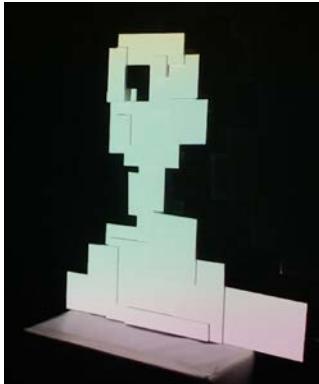
The next page contains screenshots from videos I took of the glitches. The videos can be found in the folder titled "6. Gormley test".

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Big Pluck 2 (2016) by Antony Gormley

# 32



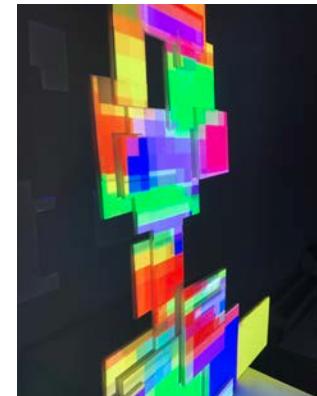
White, displacement glitch only



With this 2.5D artefact, the effect of the glitch was surprisingly underwhelming. I feel that the main issue with the model is that there isn't really enough depth and the shape is essentially just two dimensional. With this reduced depth it doesn't really have the same striking effect as it did with the bust of Aphrodite I used in previous experiments. However the underwhelming effect could also be due to the form itself, as perhaps the realist sculpture responds better to the glitch aesthetics as the form itself is something much more familiar in the physical world, causing the combination to be much more engaging. Having looked again closely at Gormley's sculptures compared to my prototype, the sense of presence they have as life size human structures will definitely play a big role in the effect glitch will have when projected. I believe the imposing 3D form of his works contain the extra dimension of physicality which the glitches so desperately want. This experiment had made me come to realise the importance of 3D depth in the sculptural form as being an essential requirement for creating a good looking effect and gaining a new perspective on the glitch aesthetics. I also feel that the glitches themselves need to have more texture to them rather than being blocks of pure colour. I say this in contrast again to the bust experiments as they used a photograph as the starting point. This allowed the grain and detail of the physical form itself become manifested and distorted through the glitches making the effect once projected much more impactful.



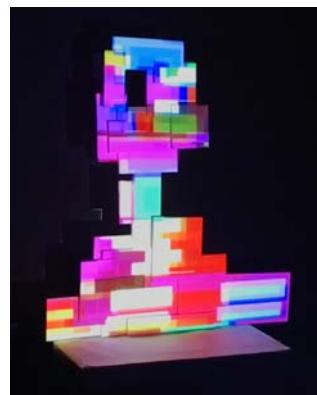
White, displacement and colourful glitches



Close-up to show the slight depth of the model.



Coloured, displacement and colourful glitches



Coloured, displacement glitch



The white projection with the spattering of colour introduced by the glitches, in my opinion had the best effect. However due to the lack of depth, the bright white projection largely washed out any shadows there were causing the form to look rather flat and uninteresting. Having done this experiment a few days before the deadline, it is a shame that I don't have time to iterate and experiment with the form and glitches. However this was definitely a worthwhile experience as it has put into perspective the important role the physical medium plays in relation to the glitch, a thought that had been previously overlooked.

# AUDIENCE

## And the criticality of glitch art

I read a very interesting article about the criticality and nature of glitch art written by Michael Betancourt (2014). In it, he considers the integral role of the audience in order for the glitch art to be interpreted as critical. Glitch artists/ writers Iman Moradi and Rosa Menkman commonly categorise glitch art as an inherently critical activity with roots firmly based in Modernist aesthetics. They suggest that glitches reveal the foundations and processes of digital media through displaying these technical failures. However these dimensions only appear when an audience actively engages with the work and chooses to interpret it critically.

In the realm of audience interpretation, and the context of the graduate show, the origins of the glitch are not important. Be they accidental or made intentionally, their interpretation depends on their visual (or auditory) manifestation and the context in which they appear relying on interactions between other, similar works rather than the formal origins of the glitch. It will be interesting to see how this installation is received in the grad show as it will be placed in a context containing a variety of new media projects ranging from iOS applications to other projection mapping pieces.

Betancourt also discusses the nature of glitches in a way that helps contextualise the need for this project. He discusses the 'aura' of the digital and it being recognised as a completely separate dimension from the physical world. The aura of the digital strips the physical dimensions of the media as it exists in a sort of magical world beyond constraints and human control. It strips the technical failures from consciousness, naturalising them as various digital artefacts. People have become used to encountering these digital artefact (pixellation, glitches while streaming video etc.) that they have become a part of the normal interaction with the digital and are almost expected. Glitches can then be seen as ruptures in this magical realm where the mystical digital aura provokes an awareness to the physicality of the digital medium. It is the role of glitch art de-familiarise these glitches, make them more prominent so they can be engaged with.

Glitch art, much like the New Aesthetic emerges from what was/ is more commonly purely digital. It is the realisation of the immateriality of the digital as physicality through their manifestations. Here, my projection installation combining physical form and glitch art takes this one step further as it maps the physical realisation of the digital onto something 3D and even more 'real'.

The criticality and meaning of glitch emerges from how the glitch interrupts the anticipated flow of the work and the significance of those interruptions. Framed as an exploration of digital and physical media, the glitches engage with the expected flow of the physical sculptural forms opening them up to new meaning as the glitches disrupt expectations bring focus to the medium's presence as well as the form it takes. It would be interesting to consider what would happen if a work was composed primarily of glitch. This would mean that the glitch is the expected flow of the work, and the glitches no longer function as glitch. What then would happen if the work was to 'glitch' back to a state of normality, a state of not being glitched? Does this new unglitched state become a the glitch as it breaks from the normative flows of the work? This is an interesting idea I could experiment with.

### DEMOGRAPHIC

The ideal audience for my project are people who are familiar with the works of Antony Gormley and glitch art. This familiarity will provide a contextual platform for the work to stand on, making the focus and goals clearer. The installation requires an active audience as they engage with and interpret the works. As they are faced with various abstract forms, each painted with glitch projections they can explore the impact of the glitches as they further distort the glitch-like forms while the boundary between the physical and digital is unclear. At the very least, a less active audience could observe and enjoy the almost mesmerising dance of the glitches as they flicker in and out of existence in 3D space.

Given the context of the grad show as a show for Digital Media Design, it's safe to assume that the majority of people will be more familiar with glitches and potentially glitch art rather than Gormley's sculptural works. In which case the experience of focusing on and physicalising digital glitches should be novel in itself, allowing the audience to view glitch in a new and interesting way.

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# EXHIBITION

## Considerations, limitations & concerns

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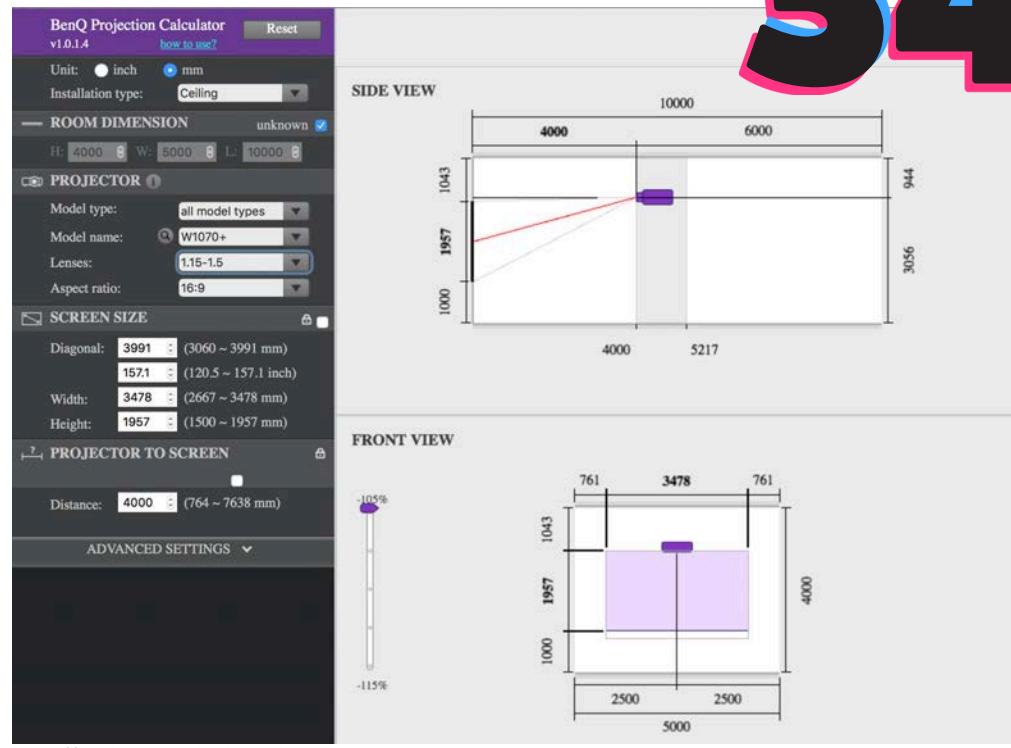
### THE SPACE AND PROJECTORS

For the exhibition, I would like a space where multiple sculptures can be placed, allowing visitors to walk amongst them, similar to that of a more traditional museum. However, as the installation relies on projection, it is important to consider the restraints set in place by the projection medium itself. Firstly, as I only have one projector, this could limit the number of sculptures I am able to project onto. I know that the university has some, but availability will depend on the requirements of other projects as they may also need projectors.

For the installation, I'd like the projector to be ceiling mounted to clear the floor space in front of the project, allowing the audience to get closer than they could if it were on the floor without blocking the projection. There is an online tool to calculate the size of the projected image based on its position. Using an arbitrary distance of 4m, the resulting image is approximately 3.5m X 2m. Given a large enough throw distance, I could be able to project onto three forms with a single projector which would be great. The sculptures will need to be equidistant from the projector so that the images remain in focus. I am also very conscious of the fact that with a single projector, the glitch art projection will only 'glitch' one side of the sculpture. This is something that I will need to experiment with, but it may mean that the positioning of the sculptures, and the path created for the audience will have to limit the interactions to the side with the projection.

### HEALTH AND SAFETY

Working with projectors means there are some obvious risks involved. Firstly if the viewer moves into the projection space, there is the risk of the bright light hurting/ damaging their eyes. There is also the risk of cables in the space which will need to be minimised as they will be a tripping hazard which could also damage the equipment. The sculptures will also need to be secured, firstly so they don't get moved and ruin the projection mapping, and secondly so they don't fall and injure anybody.



### THE PHYSICAL FORMS (SCULPTURE)

As this is the side of the project which I am least experienced with, A major concern is the standard of the forms I produce in terms of quality, originality and the materials used due to my lack of training and experience in physical media. To address this, I will need to take considerable time working with the materials and producing the forms in order to improve my ability. I am currently hoping that foamboard will be suitable for this project as it is (relatively) easy to work with and low cost which is great for the iterative process I intend to use. I am also hoping that the collaboration will help with this process as I firmly believe that much more can be learned and achieved when working collaboratively due to the varied skill sets and sources of creativity. As I am using Gormley as inspiration for the forms, it will be important not to end up copying his work directly. There still needs to be some resemblance to provide context to the work but originality is key.

# TIME MANAGEMENT

## Time planning and prioritisation

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As I intend on using an iterative, exploratory process, it is essential that I have some general time planning measures in place in order to stay on track and produce enough meaningful experiments. To do this I will employ the use of a Gantt chart to set out time-frames to achieve certain tasks and produce a final artefact for the exhibition. My hope is that I will be able to use some of the work generated in the experimental stage and take it forward for use in the final installation following feedback and review from myself, peers and tutors.

	1 <sup>st</sup> Feb	8 <sup>th</sup> Feb	15 <sup>th</sup> Feb	22 <sup>nd</sup> Feb	29 <sup>th</sup> Feb	7 <sup>th</sup> Mar	14 <sup>th</sup> Mar	21 <sup>st</sup> Mar	28 <sup>th</sup> Mar	4 <sup>th</sup> Apr	11 <sup>th</sup> Apr	18 <sup>th</sup> Apr	25 <sup>th</sup> Apr	2 <sup>nd</sup> May	9 <sup>th</sup> May	16 <sup>th</sup> May	23 <sup>rd</sup> May	30 <sup>th</sup> May	6 <sup>th</sup> Jun	13 <sup>th</sup> Jun	20 <sup>th</sup> Jun
<b>Project start - refocus on topic</b>																					
<b>Learning new glitch skills</b>																					
<b>Mini experiment 1</b>																					
<b>Mini experiment 2</b>																					
<b>Mini experiment 3</b>																					
<b>Mini experiment 4</b>																					
<b>Reflection &amp; feedback</b>																					
<b>Large experiment 1</b>																					
<b>Large experiment 2</b>																					
<b>Evaluation and collation of experiments</b>																					
<b>Final installation production</b>																					
<b>Finishing touches &amp; Feedback</b>																					
<b>Exhibition show preparation</b>																					

In terms of prioritisation in this project, I initially attempted using MoSCoW but found the structure is too rigid for an exploratory process such as this. Obviously there are key deliverables that the project must have, but the extent of these will only be revealed during the production process. To start, the project **must** be a projection mapping based installation with three complimentary but varied sculptures and the glitch art projections to follow the intended triptych format. There is potential to add more components such as interaction (as I have experimented with) but whether this is included in the final artefact can only be properly decided after further experimentation. There is also potential to make

Each experiment will result in the production of at least one projection mapped glitch aesthetic sculpture. There will be exploration in both the sculptural and glitch production phases. There will be frequent testing with the mapping component to allow both the physical and digital elements to work in tandem and dialogically with both inspiring each other during the process. Each week long mini experiment, and the larger experiments give me ample time to learn the skills needed to produce glitch and physical forms as I go along.

this an audiovisual installation, by introducing glitch music. Again, this is something which will arise in the experimentation as producing glitch music is a skill I will need to learn. I have allocated time for two large scale experiments which I am hoping will give me enough time to produce higher quality work which could potentially form part of the exhibition. These larger experiments also give scope to experiment further with adding interactivity and/or audio to the work. Each experiment will be open to collaboration in production, and the explicit periods for reflection and feedback offer opportunities to discuss results and potential future directions in more detail.

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