# Assignment 1

# Proposal

## Assignment 1: Proposal

# Overview and Research Statement

Unlike semester one, which involved developing a video game, this major project will be more relevant to my creative field of interest.

In 2018, my specialty was photography, but this didn't evolve much as my interest was mainly in the technical aspects, and the cost of equipment was off-putting.

The project I propose for this semester is a 3D rendered character that resembles a real person. Hopefully by the end the skill and effort put into it will make the character easily recognizable.

As shown later in this workbook, I have a very basic understanding of creating CGI characters, so in order to make this project better than the examples shown, a lot of time will be spent researching better ways of modelling, texturing and rigging, as well as basic studies of anatomy and expressions. Another important area of research will be observing the person's most noticeable characteristics and mannerisms.

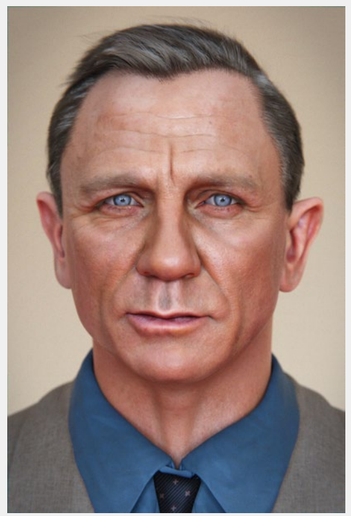
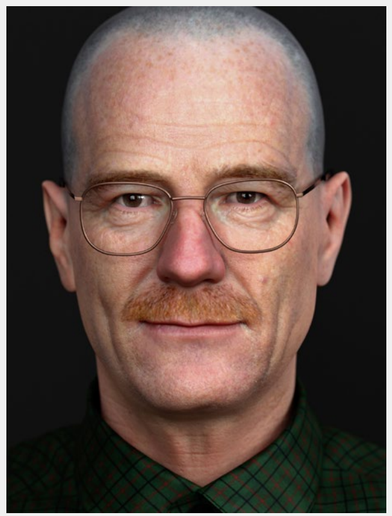
Specific skills I'm aware I have no experience with are using specialized software such as Substance Painter and Mari, material attributes such as subsurface scattering, and both body and facial rigging.




The Queen's Corgi (2019)



Sci-Fi character (October 2021 and January 2022)

Credit to George Siskas
https://www.artstation.com/geosis093


Dylan Nathaniel-Jones (June 2022)

Assignment 1: Proposal

# Relevant Work and Practitioners

When researching similar media, I remembered a film released a few years ago that had CGI recreations of the Queen and Donald Trump, called The Queen's Corgi. I've only seen the trailer, but the modelers have done an okay job.

The art style is simplistic, but the point is they're recognizable.

3D artist George Siskas has also made a passion out of recreating people in CGI. Pictured here are Daniel Craig (James Bond) and Walter White (Breaking Bad).

Useful websites where people publish 3D art are ArtStation and ZBrush Central.

Also pictured here are recreations of the sci-fi character I made last year and of Dylan Nathaniel-Jones.

The sci-fi character remake was initially made in October 2021 alongside the Applied Media artefact. The January 2022 revision adds basic eyelids, nostrils and ears, as well as better topology for the neck.

While the Dylan recreation shows notable facial improvements, it could've been a lot better. Side-by-side, it lacks Dylan's eye bags, puffy lips, ears and hair. Had I focused on adding these small details, I'm sure anyone familiar with Dylan would've been able to recognize him more easily.

3.5x5in / 89x127mm (matte)
$0.49 each

4x4in / 102x102mm (matte)
$0.49 each

4x6in / 102x152mm (matte)
$0.49 each

5x5in / 127x127mm (matte)
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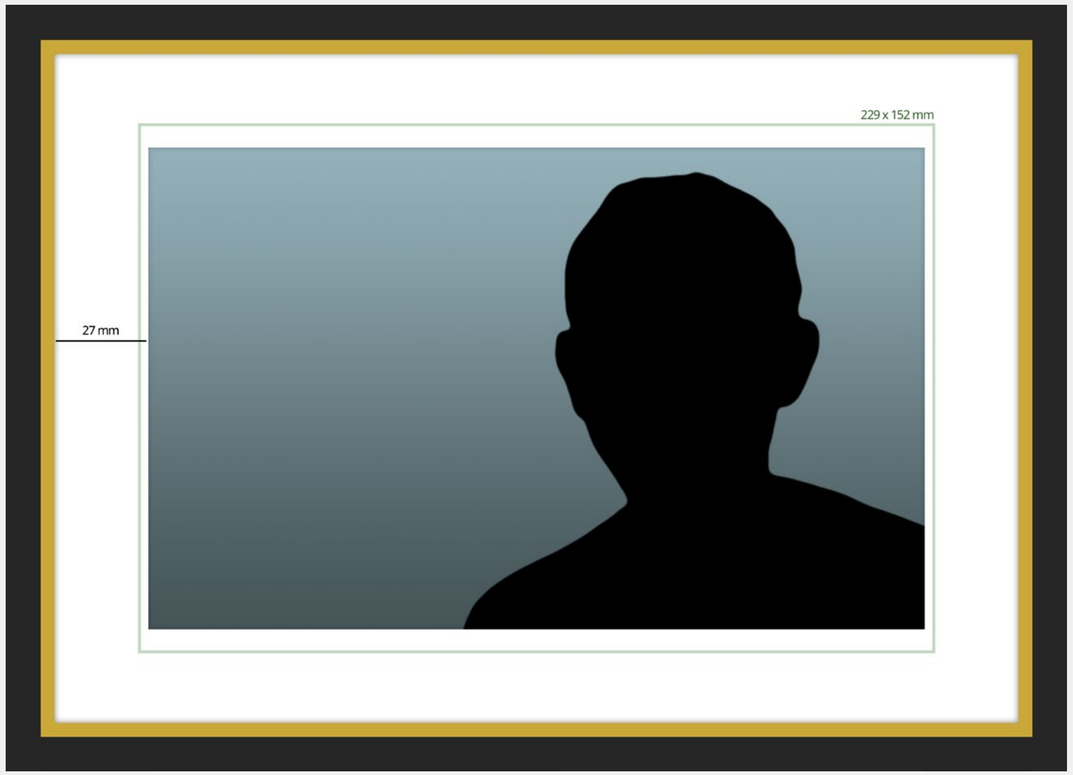



Assignment 1: Proposal

# Exhibition

The plan for exhibiting this project will be professionally printing and framing the finished render of the character and displaying it in the Te Auaha gallery.

I already have an A4 frame, pictured here, along with a proportionately-accurate recreation so I can easily measure the best mat board opening and the print size option needed from the list shown. As depicted by the green outline, the photo itself will be 229x152 mm, meaning at a standard resolution of 300ppi, the image will need to be rendered at 2704x1796 pixels.

The framed photo might also be accompanied by a small description card (similar to those at museums and other galleries).

In addition, a video might be made that shows the developmental process behind the character, for instance sculpting and animating. This will be useful for a bachelor student compilation if such a thing exists.

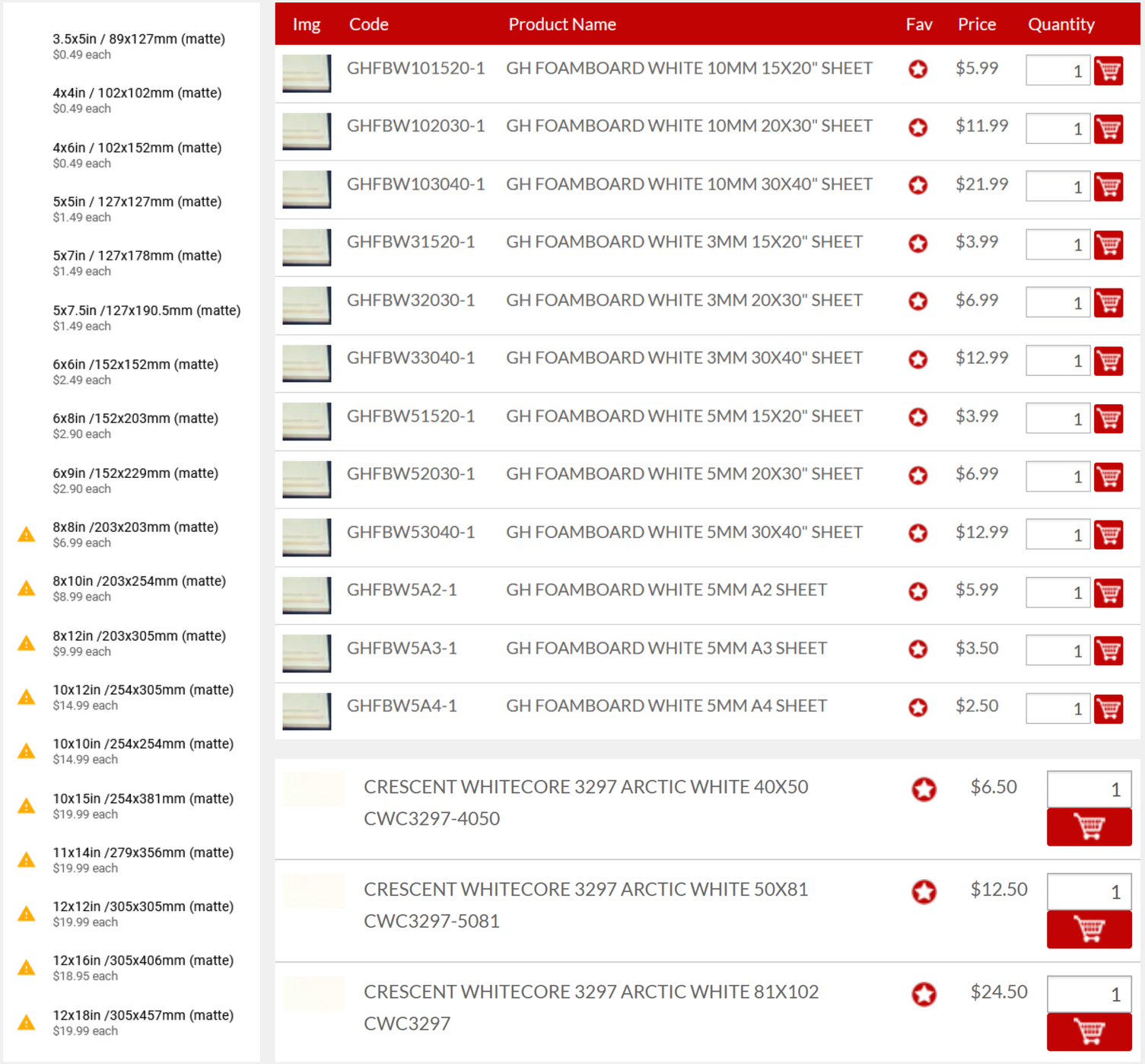
# Budget

The digital side of the project will involve the use of Adobe's Creative Cloud, specifically Photoshop for image manipulation and texturing, InDesign for creating these workbooks, Substance Painter for texturing, Blender for digital sculpting, Autodesk Maya for modelling, rigging and animating, and RenderMan for the final render. I have access to all of this software for free, thanks to student and non-commercial plans.

The physical side will involve the cost of printing the rendered image, the mat board and the foam core. These resources can be processed with the help of Photo Warehouse and Gordon Harris. Pictured here is a list of sizes Photo Warehouse supports.

As mentioned in the exhibition section, the cost of the print will be $2.90 for the 152x229 mm option, the cost of the mat board will be $6.50 for the 40x50 mm option, and the cost of the foam board will be $2.50 for the 5 mm A4 option.

The total cost of all resources will be $11.90.



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| Img | Code | Product Name | Fav | Price | Quantity |
|---|---|---|---|---|---|
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| | GHFBW102030-1 | GH FOAMBOARD WHITE 10MM 20X30" SHEET | | $11.99 | 1 |
| | GHFBW103040-1 | GH FOAMBOARD WHITE 10MM 30X40" SHEET | | $21.99 | 1 |
| | GHFBW31520-1 | GH FOAMBOARD WHITE 3MM 15X20" SHEET | | $3.99 | 1 |
| | GHFBW32030-1 | GH FOAMBOARD WHITE 3MM 20X30" SHEET | | $6.99 | 1 |
| | GHFBW33040-1 | GH FOAMBOARD WHITE 3MM 30X40" SHEET | | $12.99 | 1 |
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| | GHFBW5A4-1 | GH FOAMBOARD WHITE 5MM A4 SHEET | | $2.50 | 1 |
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| | CWC3297-5081 | CRESCENT WHITECORE 3297 ARCTIC WHITE 50X81 | | $12.50 | 1 |
| | CWC3297 | CRESCENT WHITECORE 3297 ARCTIC WHITE 81X102 | | $24.50 | 1 |

# Timeline

Listed below are the main stages of this project, along with a brief description of what each of them involves.

**Observation and Concepts**
Looking at reference images, I'll make note of the character's traits and key features in an attempt to make him more recognizable. At this point I'll also sketch concept art.

**Sculpting**
Using Blender or ZBrush, a 3D model will be sculpted that resembles the character. I'll start by using front and side reference images to shape a sphere, then in perspective view I'll fill out all the other details.

**Retopology**
For this process, I'll bring the digital sculpt into Autodesk Maya and using the Quad Draw tool, go over the mesh with new polygons laid out in an ideal formation for animation.

**Texturing**
I have access to texturing software such as Substance and Mari, so this will be used to colour the character.

**Rigging**
This involves placing joints for the shoulders, neck and head, as well as an advanced control mechanism for facial animation.

**Hair and Cloth Simulation**
This will involve using technologies such as xGen, nHair and nCloth to create the characters hair and clothing.

**Lighting**
An important part of 3D art is the lighting, so I'll use this time to learn useful skills on light placement and other stuff.

**Rendering**
The character will be rendered with RenderMan 24, as this is a free for non-commercial use renderer that I've had plenty of practice with and have used since 2017.

**Background**
In the reference, the background is a simple grey wall, so I can easily make this in Photoshop with shapes and blending modes.

**Printing**
Once the render and background have been composited together, I'll send the image off to a professional printing company.

**Framing**
Using skills from 2018, I'll use a mat board and foam core to make the printed photo look better in a frame.

# Bibliography

Siskas, G. (December 1, 2021). *Daniel Craig (No Time To Die)*. ArtStation.
https://www.artstation.com/artwork/vJ2g9a

Siskas, G. (July 26, 2022). *Walter White / Heisenberg*. ArtStation.
https://www.artstation.com/artwork/Vyvg2g

Entertainment Access. (April 19, 2019). *THE QUEEN'S CORGI Trailer (2019)*. YouTube.
https://www.youtube.com/watch?v=Q_YVjq737jY

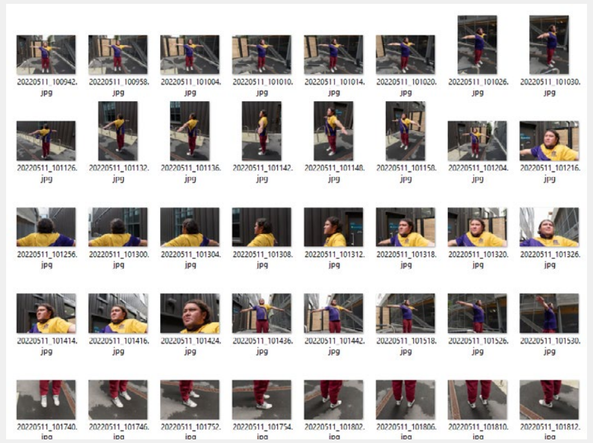
*CRESCENT WHITE MAT BOARD*. Gordon Harris.
https://www.gordonharris.co.nz/category/3183-crescent-whitecore-mat-board

*FOAMBOARD WHITE*. Gordon Harris.
https://www.gordonharris.co.nz/category/1540-foamboard-white-gordon-harris

# Assignment 2

# Progress Update

# Concept Art

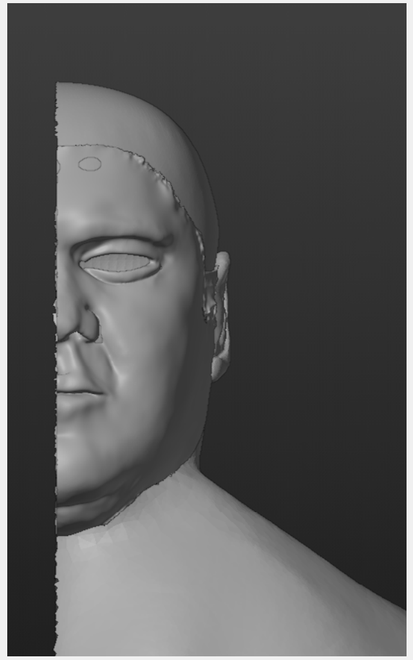


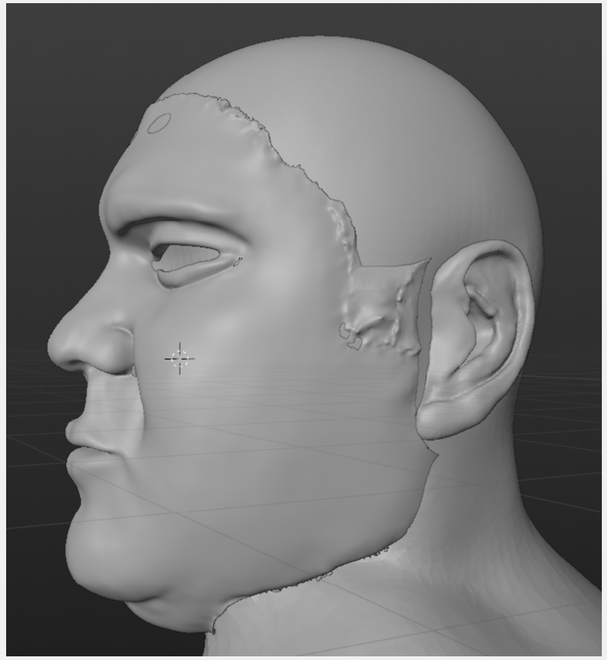
Assignment 1: Proposal

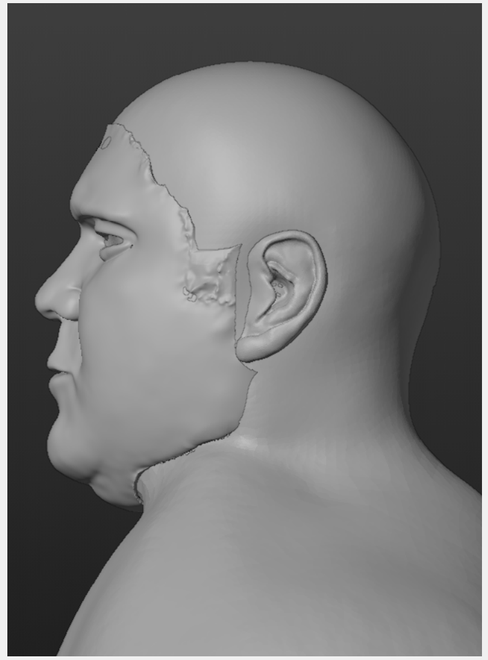
# Reference

Rather than being limited to a front and side view of Dylan to recreate him in 3D, I had hundreds of photos from various angles that I had previously used for a photogrammetry experiment. This meant I was able to measure the right proportions in 3D software and get a detailed look at his face.

This scanned model in the top-left would form the foundation of the sculpt which I explain on the next page.







## Assignment 2: Progress Update

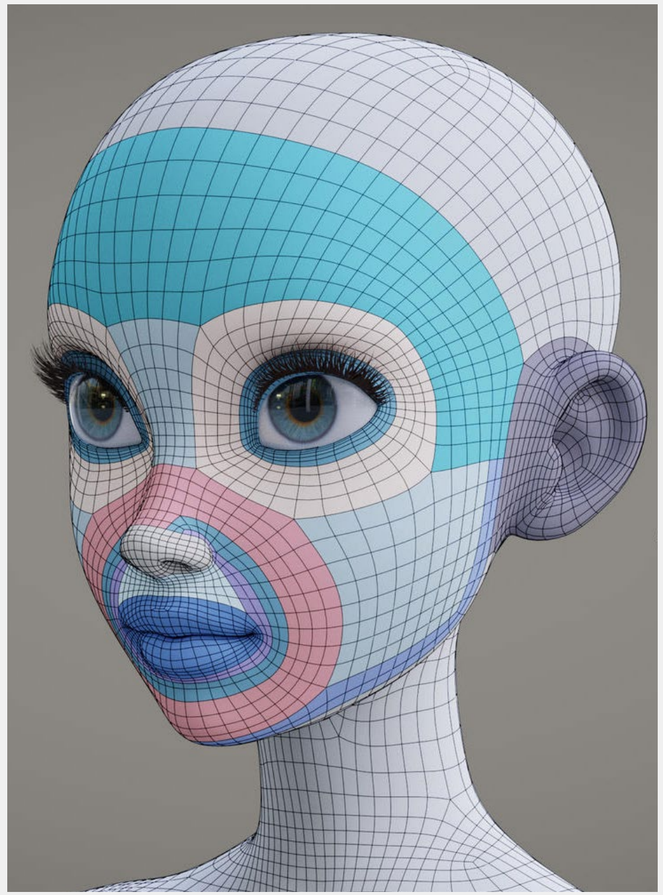
# Sculpting

Using the photogrammetry model of Dylan's head for reference, I created a few spheres in Blender and sculpted them into shape.

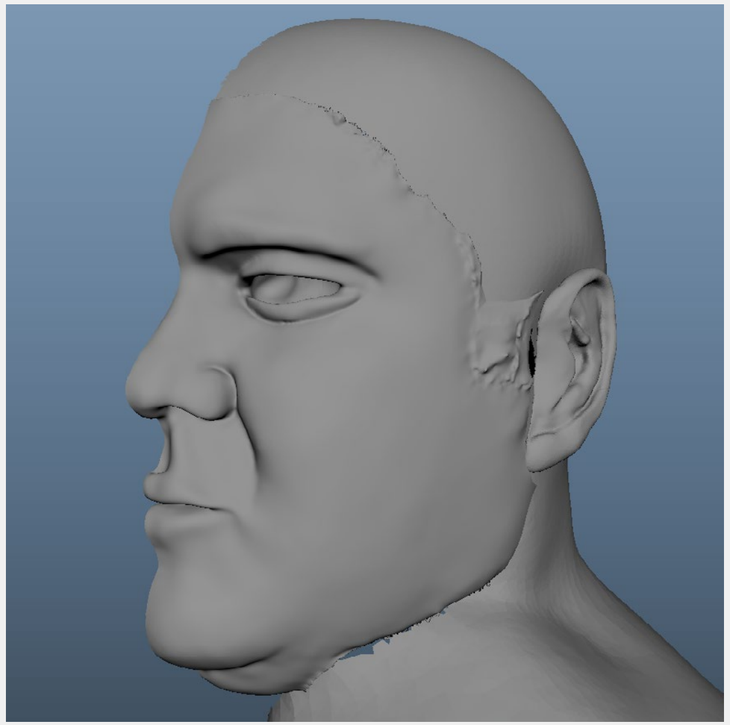
My preferred software for 3D is Autodesk Maya, but I find the navigation in Blender to work better with a graphics tablet, which I needed to sculpt the fine details.

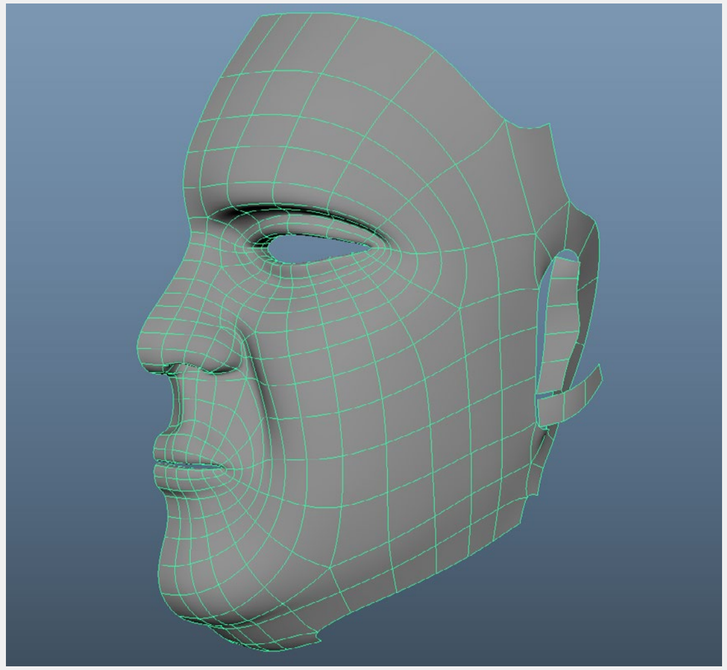
The reason for sculpting only half of his face is so that I could flip it around later and ensure both sides were symmetrical.

The final polycount for the sculpt was around 400,000 faces, but in order to make it easier to animate I would need to recreate the shape by placing polygons in a cleaner formation, a process called retopology.



Credit to Nazar Noschenko





## Assignment 2: Progress Update

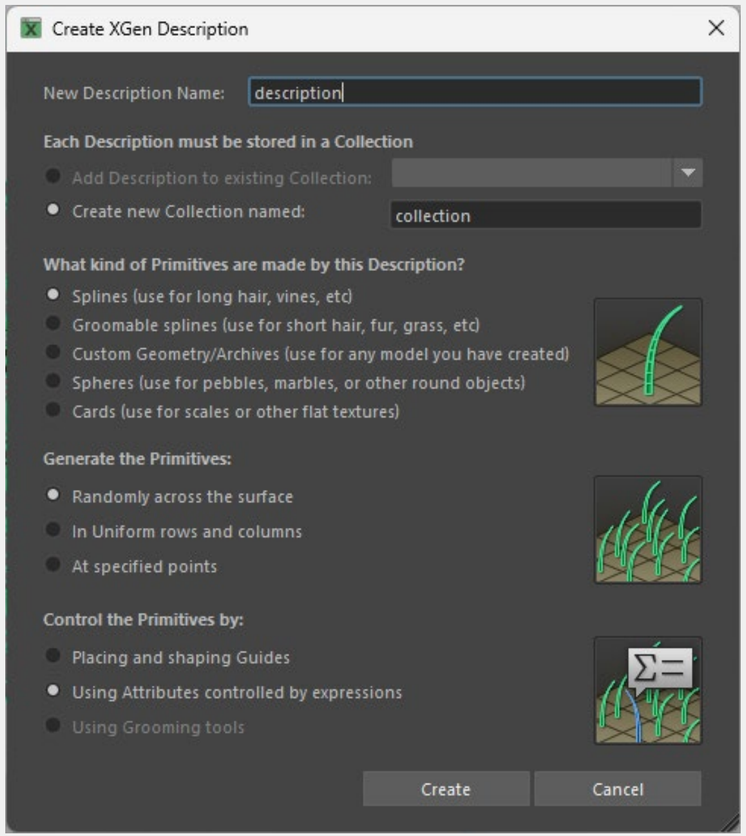
# Retopology

The idea behind retopology is to create a cleaner mesh that can be more easily controlled and animated compared to a sculpt.

Pictured in the top-left is an example of good head topology by an artist name Nazar Noschenko. He's highlighted various sections of the face in different colours, with a key similarity between them being the "five-point stars" at the corners. These redirect the edge flow which allows the face to deform in a way that resembles muscle movements in real life.

# Texturing

At this point I hadn't got around to learning Substance Painter, so after UV unwrapping the retopologized head, I brought the guide into Photoshop and using the brush tool, painted some lips, nostrils and cheeks, as well as shaded areas for the eyelids and hair.




## Assignment 2: Progress Update

# Hair and Cloth Simulation

Just like at the start of the year in a practice Cyberthug render, I used XGen to simulate Dylan's hair, as this time around he wouldn't have a beanie to hide the lack of it. There are different ways to create hair using XGen, as seen in the dialog box, and by connecting it to Maya's nHair system, I might be able to make it be affected by gravity and physics.

I was unable to get a realistic render of the XGen hair working in time for this assignment, so that's something I'll have to look into later.

Cloth simulation is still to come. This would likely be a simple shirt or hoodie, as the final render would be of the head and shoulders. Depending on the success of the hair, Dylan's beanie might make another appearance as a simple geometric object.

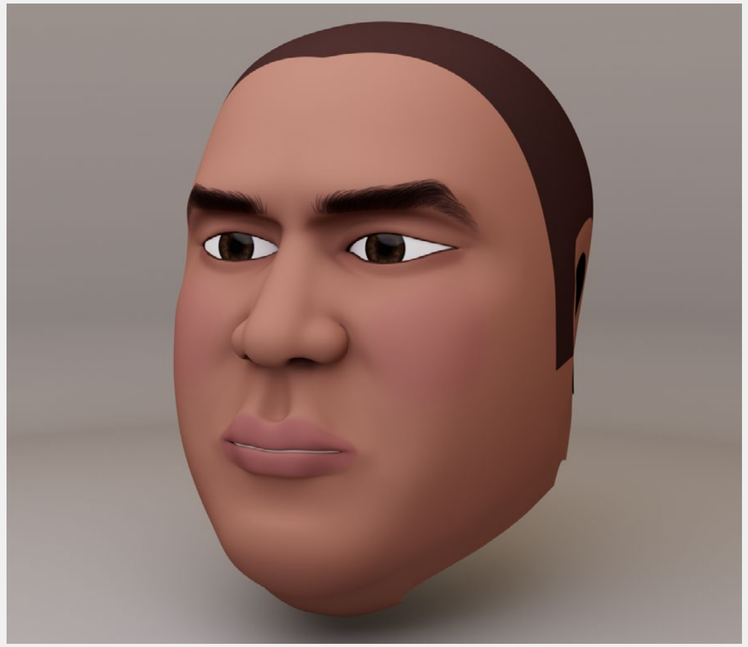
## Assignment 2: Progress Update

# Professional Printing Tests

Toward the end of July I had printed the Mount Victoria render from earlier this year in both matte and glossy formats to see how they compare. Behind the frame's glass panel, the glossy photo would've introduced a second reflection, which I figured might be distracting and unpleasant to look at.

I was led to believe from online research that the sharpness and colour would be better with the glossy print, but in reality they turned out identical. To test the limits, I over-saturated the render and saved it in the Adobe RGB colour space before sending it through to Photo Warehouse on Victoria St.

Render date: 3 July 2022



Render date: 20 September 2022

Assignment 2: Progress Update

# Mid-Project Reflection

Comparing the version of Dylan in this project with the one used in semester 1's Applied Media, there's noticeable improvement to both the geometry and texturing. In the lead-up to assignment 3, I'll ask Dylan for feedback, as he knows his face better than anyone.

**What works**

I'm particularly impressed with how the nose has improved this time around, with a more clearly-defined shape that's almost identical to the reference.

The eyebrows are more realistic and angular, which fits with Dylan's ones, even if they are a bit too thick. Despite being just a simple diffuse texture (same as before), they seem to have more depth to them.

**What could be improved**

Something about Dylan's lips looks a bit off. When asking several people for feedback, two of them noted there was too much distance between the nose and lips. I think the colour, shape and specularity of them could be better.

The hairline is a little too high and rounded, and missing the corners.

The ears are intentionally left out for now, as I want to spend time getting them right. Once they're done, they can be matched up with the gaps on the sides of the head.

While Dylan's eyes are a lot more developed than before, and look capable of more expression, they lack the right folds and a few reviewers have pointed out they look too big, which might be fine in a more cartoony style, but as I'm aiming for a halfway point between that and realism, it doesn't work here.

An example of how the finished artwork could look when printed and framed.
35 days to make a better-looking version of this. Easy-peasy.



# Revised Timeline

With just over a month between this assignment and the final one, most of my effort will be spent focusing on tweaks to the geometry and texturing of the character, hair and cloth simulation, environment and lighting setup, and finally preparing the finished work for exhibition.

I thought it would be appropriate to use the Te Auaha remake I've been working on in my spare time in the background of the render. By importing Dylan into the environment the lighting would all work together nicely.

From what I've discovered online, it sounds like the one thing that would require the most time is getting the hair looking just right.

**Here's the gist of what's left to do:**
- Get more feedback, specifically from Dylan
- Implement the necessary changes to the model
- Improve the texturing to more closely resemble Dylan
- Make the ears, neck and shoulders
- Facial rigging for expressions
- Hair simulation (with physics if there's time)
- Cloth simulation for the beanie and shirt
- Character/environment composition and lighting
- Final render
- Professional printing and framing

Assignment 2: Progress Update

# Gallery Description Card

**Title of work:**
Dylan Nathaniel-Jones

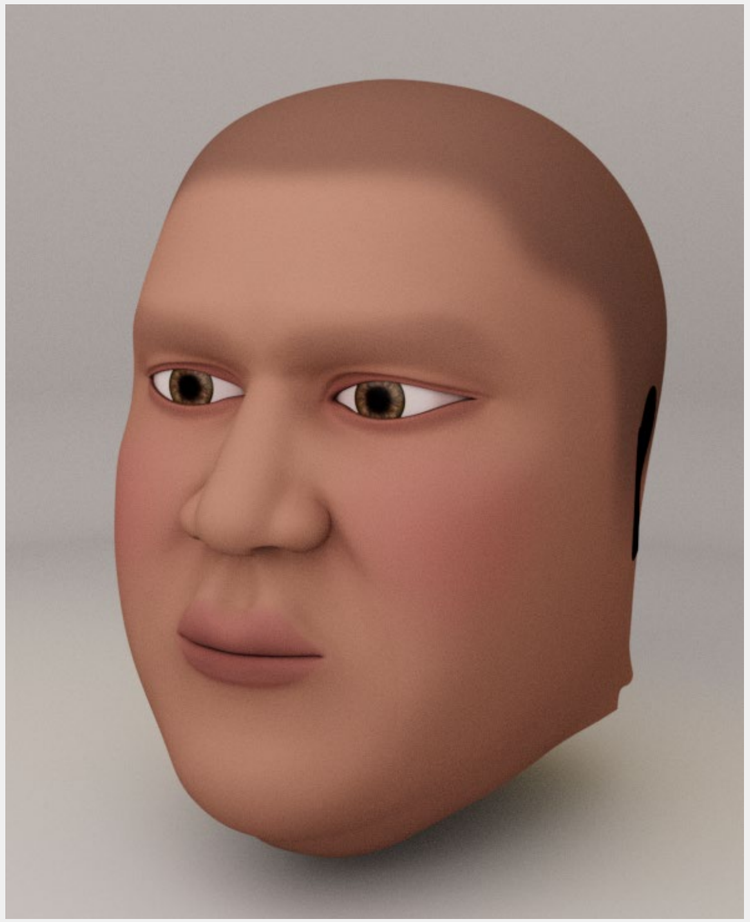
**Media:**
3D animation

**Description:**
Haven’t thought about this yet. Art is interpretive anyway.

# Assignment 3

# Project Completion

# Reference Images



Assignment 3: Project Completion

# Implementing Feedback

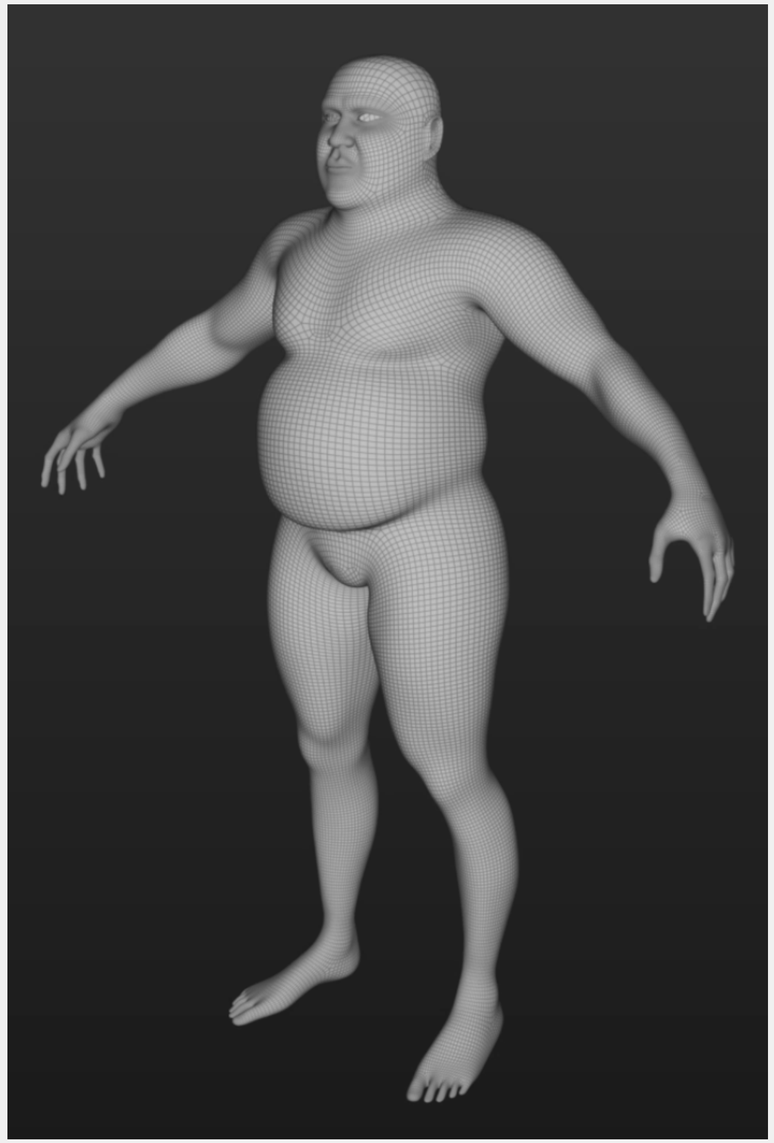
Even though I mentioned earlier that I didn't want Dylan looking too realistic, there were still some changes I needed to make to improve his appearance.

Some of the feedback I received from the assignment 2 model is listed here:
- *The folds in the eyelids don't look accurate to the reference*
- *The area between nose and lips is too long and too intense*
- *The hairline is too rounded*
- *Creases could be added in more areas such as between the brows*
- *The eyes look a bit too white, so try adding some pink to them, especially around the edges.*

The first of these was the modification of his eyelids. He has slightly folded-over eyelids which I tried to recreate as shown. I used the smooth tool on the subdivided mesh to quickly remove that. I applied the same process to the lips.

I redesigned the hair texture to resemble a male hairline (note the corners and squared-off top) and softened both the edge and color, as it only serves as a foundation for the hair simulation later on. The eyebrow textures were also removed for the same reason.

Rather than having the whites of the eyes pure white, I made them a bit darker so as to balance out the luminance of his face. I also added a bit of reflection to the irises.





# Shirt

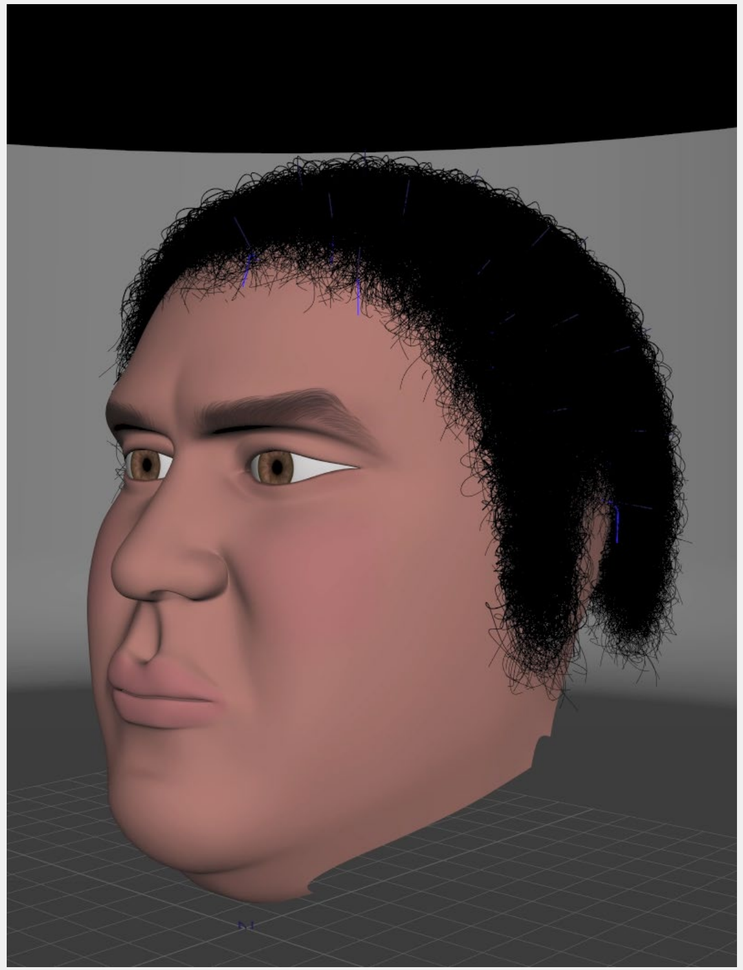
Due to time limits, I figured I wouldn't be able to create a complex jersey and so instead I made a simple t-shirt, similar to the one shown in this image from Hallensteins Brothers.

After creating the rest of the body (pictured here) I duplicated the geometry of Dylan's torso and arms, and with a few topology adjustments and smoothing, created something satisfactory.

## Assignment 3: Project Completion

# Hair Study

From looking at the photos pictured here, I can see that Dylan's hair is dark brown and possibly slightly wavy. I have two options for the hairstyle that will feature in the final render, the choice of which will likely depend on how well hair simulation works and the recognizability of Dylan.



## Assignment 3: Project Completion

# Hair Simulation

The hair on Dylan is divided into three sections: the head hair, the eyebrows and the facial hair.

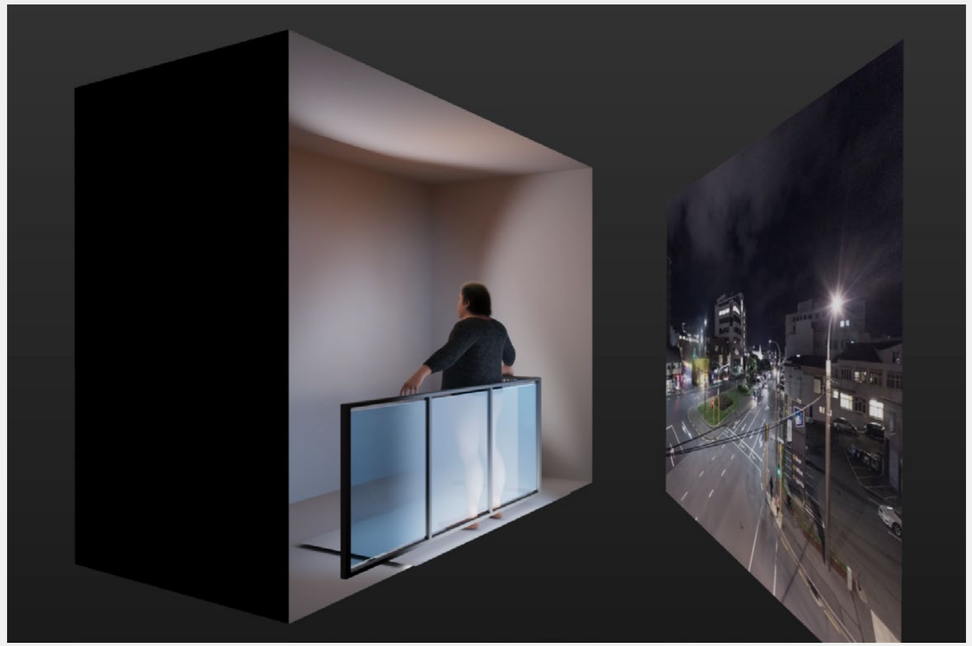
Due to the eyebrows and facial hair being short enough, I could use groomable splines to have the most control over the shape, and I wouldn't need to simulate physics for them.

The head hair on the other hand is long and wavy.

By connecting the XGen hair to Maya's nHair system, I was able to add physics. One issue was that the animation was only working in the viewport, as doing a proper render would result in the hair being shown in its initial state.

To fix this, I selected the curves in the nHair system and created an Alembic cache. Then I connected the XGen hair directly to the Alembic cache, bypassing the physics calculations.


The background used in the render



The layout of everything in the scene

## Assignment 3: Project Completion

# Environment

Using a photo taken a few years ago from an apartment in town, I corrected the light and colour a bit, then brought it into the scene as a simple plane. I connected the texture to both the diffuse and glow channels, meaning lighter areas in the image would produce more light in the scene.

I also created some glass panels as you would expect from a balcony.

Assignment 3: Project Completion

# Final Render and Evaluation

Overall, I think my skills in 3D character creation have improved a fair bit since earlier in the year. When looking at the first version of the Dylan remake, his head doesn't have the right shape and his facial features appear frozen in place, with little room for expression. This version featured in the Mount Victoria render that accompanied Applied Media semester 1.

The second version, being designed for the entirety of Major Projects semester 2, had more effort put in with more familiar placement of facial features, creases, improved eyebrow textures, and proper eyelids. This more closely resembled Dylan, but had some refinement needed, especially with the unusually bright eyes.

The third and final version builds off the same model as version 2, with the eyebrow textures now replaced with actual hair, the contrast of the eyes reduced, and the addition of eyelid folds.