C17810 Digital Studio Practice

Kingston University London

Game Design

Individual Report

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Style Mirror- Introduction

Design can be defined in the simplest method. A design can be so many things in so many ways, but the key function is always the same. Whether it is a brochure, a building, a blueprint or a chair - Design can help, solve a visual or physical problem.

As a human being, we try to solve problems daily. Every solution we come up with is done through decision making. As decision making is one of our specialties we struggle daily to decide what to wear to make yourself look the best and build self-confident through our outfit.

What if the problem is the decision making?

The solution is Style Mirror. We are innovating the way we dress. Style Mirror is an application that helps the customer to choose the outfit for them in account of weather, style, occasion friendly and event friendly.

Style Mirror - Application

Imagine, you wake up from the bed. You walk straight to a mirror (a large LED display), which gets woken up by waving your hand. It displays the current date and day, the weather, the events and occasions you have to attend and it also suggests you the perfect outfit for each events and occasion also whether friendly. You can try the outfit on you through the virtual augmentation. You wave through the suggestions, pick an outfit and start the day with more confident and less stressful.

The application is focused on solving the problem and to start the day with less stressful. Style Mirror can also help the user to browse through thousands of fashion designers' portfolio and the user can try the virtual wardrobe from them. They can either contact the designers through the online service portal or buy the outfit from them through this application.

My role as Game Designer

As a game designer, I am not here to design a multiplayer space shooter game for this project. As my project doesn't require one to do so. This is an application going to solve a huge problem for my clients. They are not going to entertain them but make them less stressful by making decisions for them

I am using all the techniques and methods of designing a game into making this application. This is a different experience for me to implement all those techniques into a problem solving application.

My role in this project is to design a basic paper prototype that helps the UI designer, the 3D artist and the Application developer to get a clear vision of the application. As this paper prototype is going to play a huge role in setting up the things straight and clear.

Also, I had a previous experience in 3D art and animation, I am letting myself to design and develop few 3D assets for the project.

As a designer, I should make sure the design works perfect and clear also act as a bridge between the 3D artist and application developer to work seamlessly towards the end product or goal.

Initial Ideation and Concept

As a team we are highly interested in designing a product that helps people in solving some day to day problem they are facing in their life. The problem doesn't have to be bigger but it can be as simple as choosing an outfit for them or suggesting an outfit for their birthday party or office meeting like a friend or family does.

We also conceptualized of bringing in a gesture controlling method to communicate with the application so the user can experience a hands-free engagement and feel free while trying out the virtually augmented outfits.

As our team has a member from the fashion designer, we also had the idea of bringing in the fashion designers to create the outfit and use Style Mirror as a social platform to create online portfolio and **monetize** their clothing outfit products.

Reference and Research

As a part of the research work, the research team carried out the research on methods, users, industry, market and competitors.

My research work is mainly on designing and developing the product. I researched some products that are currently on the market and the prototypes of the future products that are yet to hit the market.

Here are some products that are in the market:

FX MIRROR

FXMIRROR

Image source: http://www.fxmirror.net

FX MIRROR is a product of FX GEAR Inc.

FX GEAR Inc. is a company specialized in products of augmented reality and virtual reality.

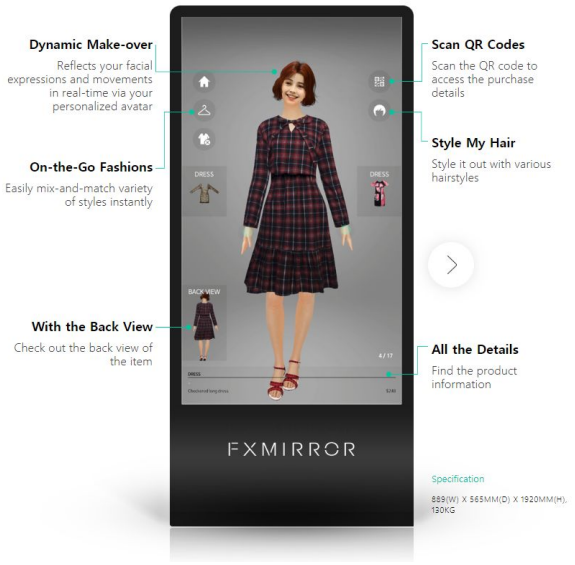


Image source: http://www.fxmirror.net/en/features

As their product has one of the cutting edge technology with augmented reality and the hardwares that supports their software requirements, They are specifically designed for the shopping outlets to replace the fitting room. One of the major problem is the user cannot see themself on the mirror and it is substituted with a 3D generated model which mimic the movements of the user.

As the 3D generated model has a different hair and physique, the user might feel disconnected and with the outfit that they are about to purchase. This product has failed the user to satisfy the need of using the virtual fitting room by giving them a virtually generated mannequin mimicking the user.

Here are some products that are yet to hit the market:

AMAZON VIRTUAL FITTING MIRROR

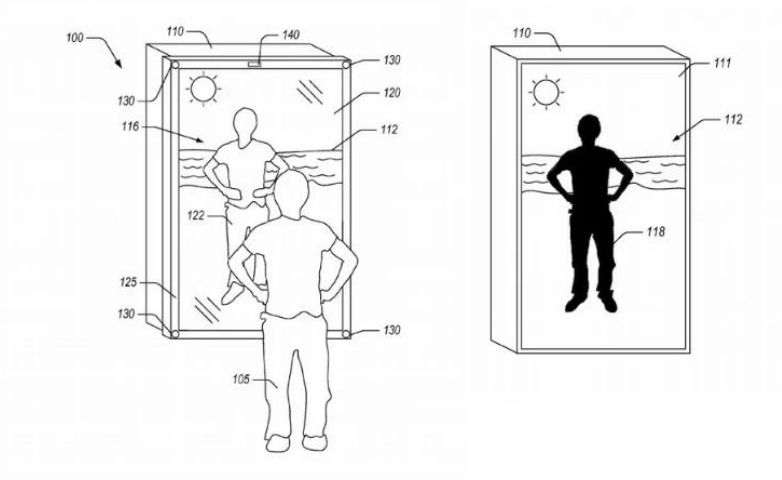


Image source:https://www.theverge.com/circuitbreaker/2018/1/3/16844300/amazon-patent-mirror-virtual-clothes-fashion

As this is yet to hit the market, it is known that amazon is interested in making the virtual style mirror.

Digi Capital had forecast the AR and VR market will hit $150 billion in revenue by 2020, bringing in about $120 billion and $30 billion respectively.

The patent describes the mirror as partially-reflective and partially-transmissive, and uses a mix of displays, cameras, and projectors to create the blended image. The imagined mirror works by scanning the environment to generate a virtual model, and then identifies the face and eyes of the user to determine which objects are to be seen as a reflection. Once this process is completed, the virtual clothes and scene are transmitted through the mirror to create the blended-reality result. (Source: www.theverge.com)

As said by the verge, the product still lacks in some personal touch with the user. As it is described as partially reflective and partially transmissive, this product has significant research to go through and this takes significant time to hit the market.

"ModiFace, the company behind the AR technology, has pumped 10 years of engineering into creating various product SDKs — software development kits – meant specifically for real-time beauty-try-on simulations." (Source : http://www.quytech.com)

With all the research and reference from the market and future market in mind, the product is designed in such a way it solves most of the problem and the major problem to solve is it has too easy to personal use rather than a commercial use.

User Journey - Paper Prototype

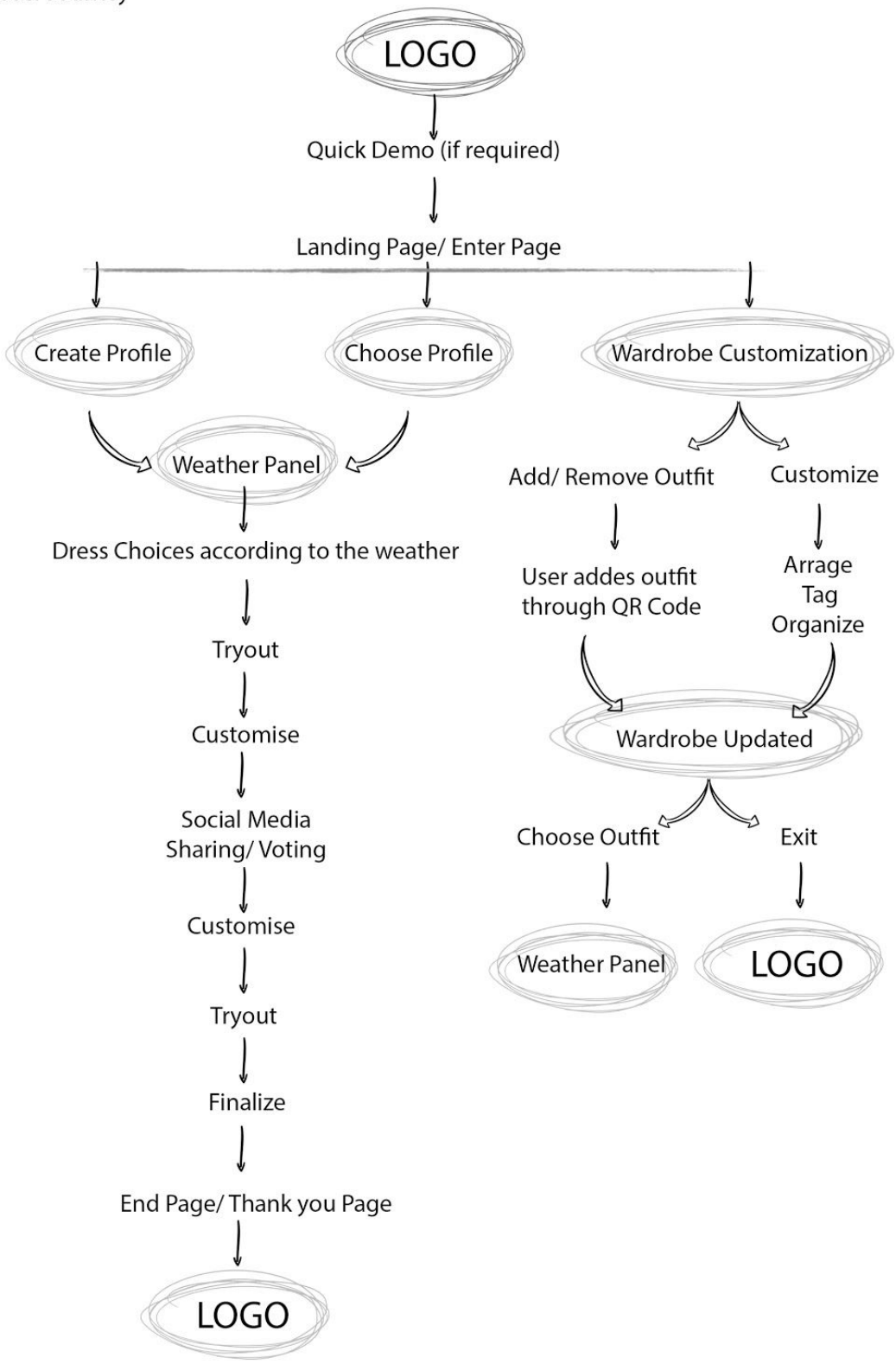
As a game designer, I use the diagramming method or making the flow chart to initially visualize the flow of the game from mechanics to mechanics or functionality to functionality.

As this is an application, this method can be implemented in the same way to give the team a rough idea of the application flow or the user journey from the start to the end.

As this flow chart helped us to concentrate on the key features like adding the weather panel, wardrobe customization and update the wardrobe. This paper prototype is later used by the UI artist to develop the low-fidelity prototype and then to the high-fidelity prototype.

Style Mirror

User Journey



Pipeline, Tools and Techniques

Since this is an application that involves Augmented reality, gesture control and virtual outfits we are specific with the workflow in bringing models and assets from one software to another in a seamless way. The special tools we used are Unity supported Vuforia.

Image Source: https://www.vuforia.com/

Vuforia is a tool which let us develop the augmented reality.

The hardwares that we required are:

Hardware

Microsoft Kinect

Microsoft Kinect is motion sensing input device developed and produced by Microsoft for Xbox and Xbox 360. The main use of kinect is the user doesn't have to use a controller or joystick to control the character.

Image Source: https://thumbthrone.com/editorial/is-the-kinect-a-total-failure-whose-failure/

As the Kinect hardware has an in-built RGB camera and a 3D Depth camera, it can scan and recognize a human standing in front of it. It can identify each part of the body. The head, body, Left arm, Right arm, Left leg and Right leg.

This device is compatible with Unity and developing the code for this is doable.

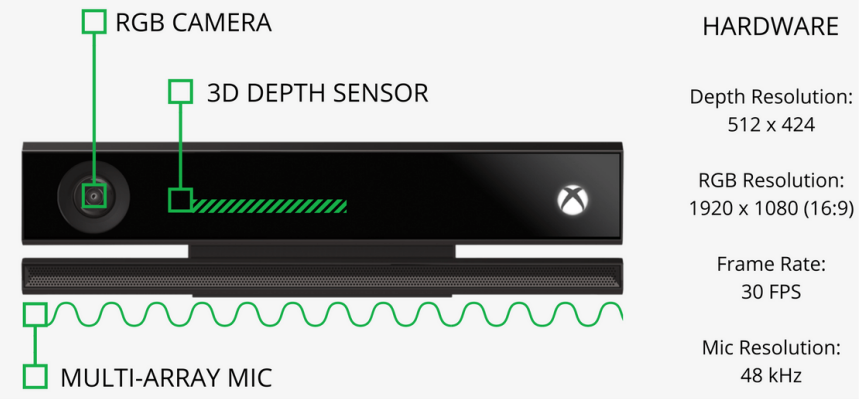
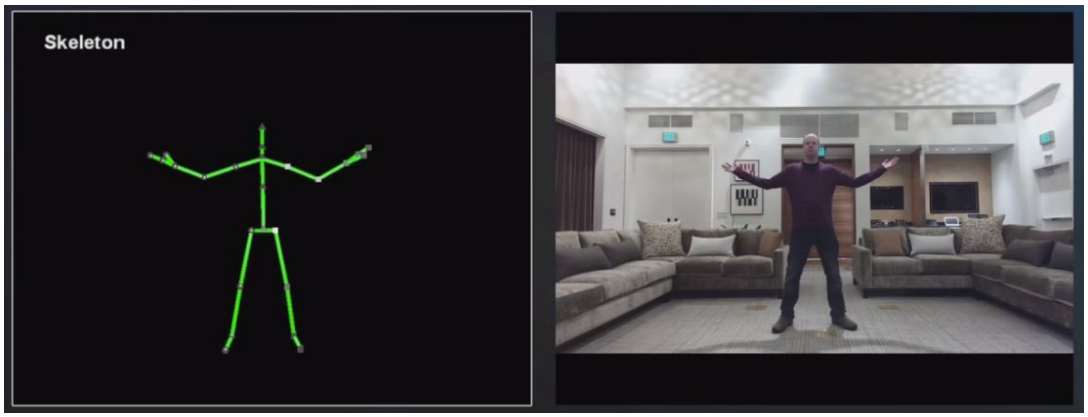


Image Source:https://kinetisense.com/kinect-motion-capture/Microsoft-kinect-sensor-specs1/

Microsoft Kinect has the depth sensor camera tracking the human body and converting it to point data which can be assigned to any 3D characters to mimic the movement of the human standing in-front of the kinect.



Screenshot from: https://www.youtube.com/watch?v=bdviGrPaQDQ

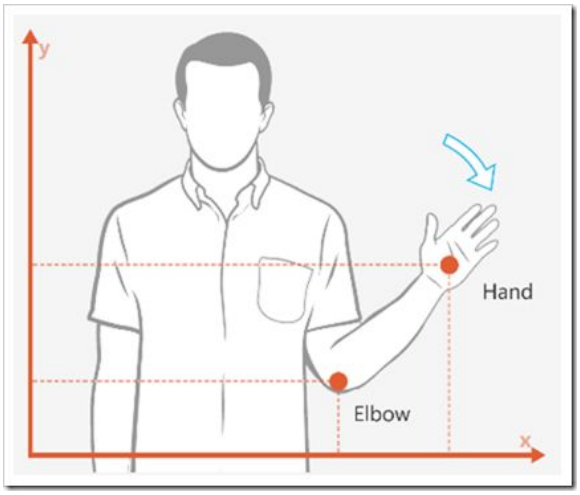


Image Source: https://neurorehabilitation.m-iti.org/tools/en/manual

As kinect has also the ability to define the hand gesture and use that as a gesture control. In other words, the user can just wave the hand across the machine to swipe left or right. Make a fist to press a button or make an 'X' arm to close the window. The possibility is endless.

Large LED Display

Image Source: http://zugara.com/virtual-dressing-room-technology

A large interactive display of the size 55 inch could be far useful to achieve the complete immersion with the application. This display interacts with the user and act as the major element in the design.

Camera

Image Source:https://www.aliexpress.com/item/HD91-1080P-HD-Webcam-Web-Camera-12-Megapixels-with-Built-in-Sound-Absorption-Microphone-for-Computer/32264051737.html

A portable camera attached to the display which helps the user to scan the QR-Code and click themselves with selfies to share with their friends or family to get feedback from them about their outfit.

Some softwares that we required are:

Software

Marvelous Designer 03

Image Source: https://blog.prototypr.io/marvelous-designer-for-fashion-design-6169eb7cdc3a

Marvelous Designer is a fashion designing tool to create the outfit and to create the simulation. This software is specifically added into the pipeline to create the outfit designed

by the fashion designer. Since the artworks are much fashionable and asymmetrical we intend to recreate in the virtual world with the help of marvelous designer.

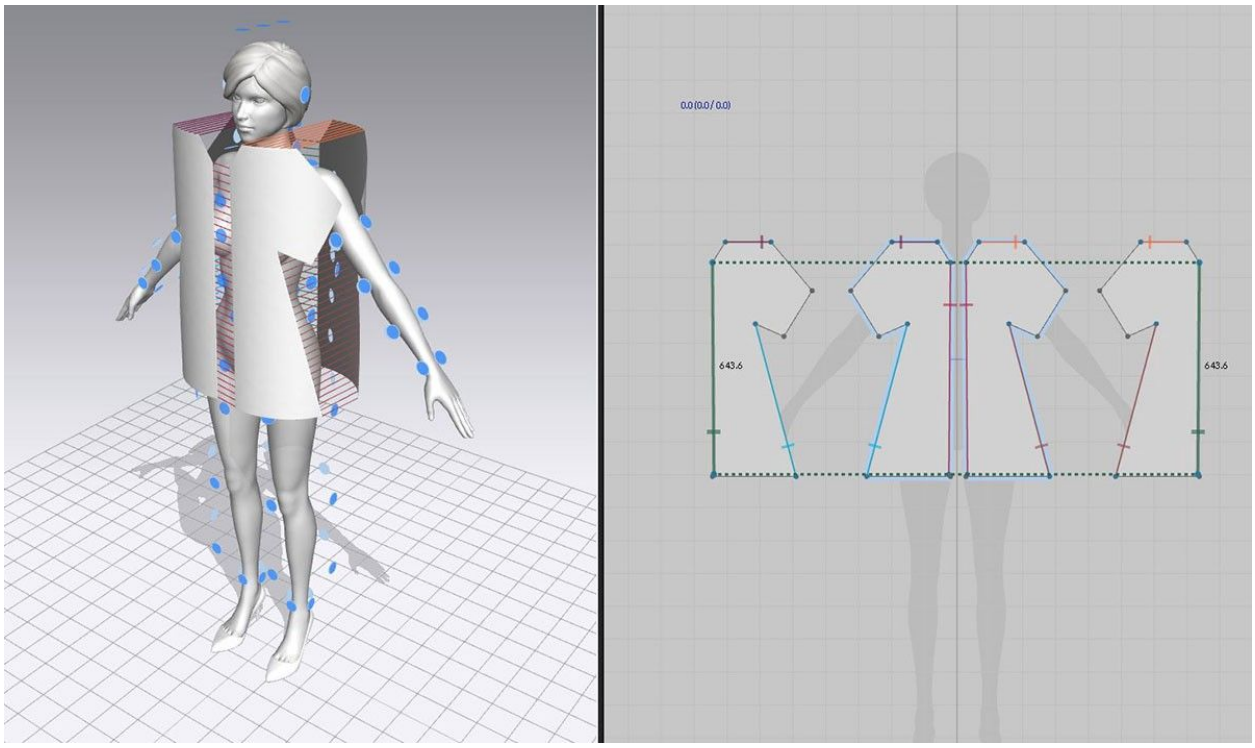


Image Source: https://blog.prototypr.io/marvelous-designer-for-fashion-design-6169eb7cdc3a

Marvelous designer works in a different way comparing to other 3D software tool. This works with the stencils and measurement given by the fashion designer.

Autodesk Maya

AUTODESK®
MAYA® 2018

Image Source: https://www.store.megafront.com/wp-content/uploads/2017/09/maya-2018-autodesk-32.png

Autodesk Maya is a 3D software mainly used for this project. As the project required a 3D model to mimic the movements of the user, the 3D model is created in maya which mostly fit for the average woman. Maya is also used to re-topo the outfit from Marvelous Designer.

The 3D model is rigged as per the requirement in the 3D engine and exported to the requirement of the developer.

Unity

Image Source: https://answers.unity.com/storage/temp/46607-otherunitylogo.png

The project is finally assembled in Unity. Unity is a 3D game engine used to build Style Mirror application. Unity works with c# and it is also compatible with the Microsoft Kinect, this is preferred more than any other 3D game engine.

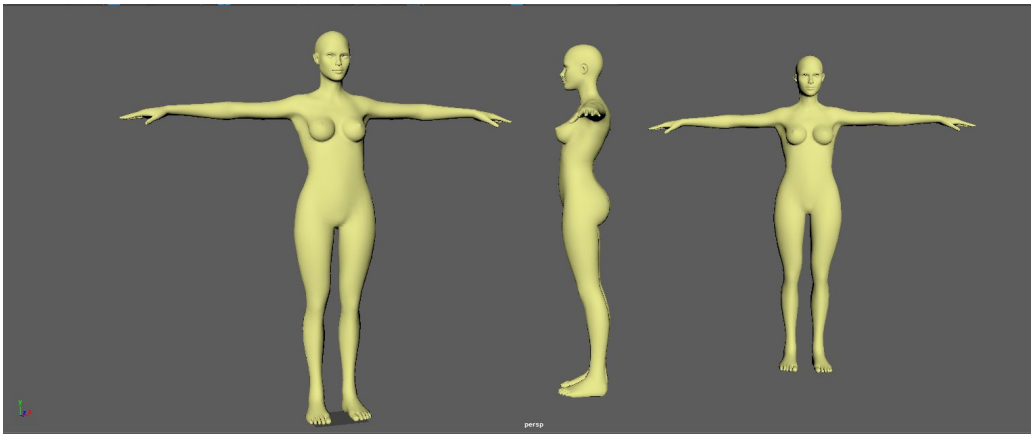
Role as 3D Artist

As I had previous experience working as a 3D artist, I had the privilege to use my skills and techniques in this project. As my skills are more into character creation, 3D character rigging and animation, I developed the 3D model for the project and rigged it.

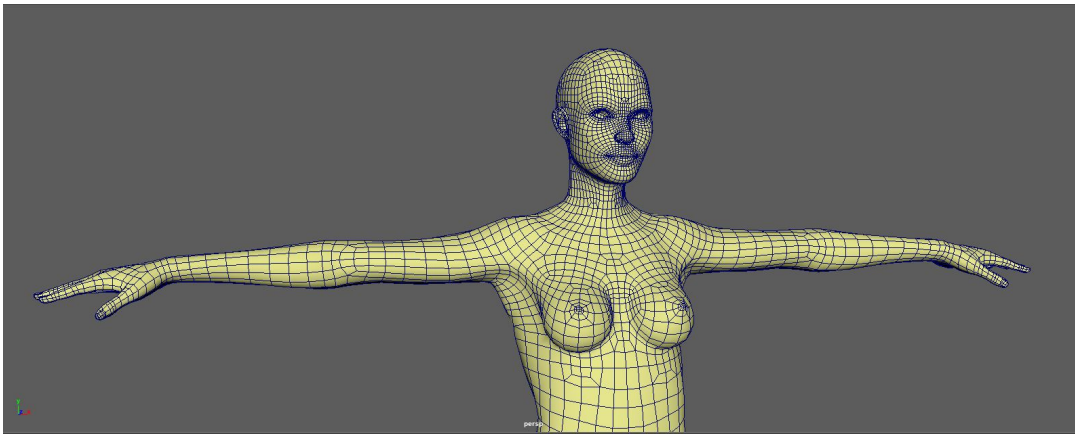
Modelling

As a character modeler, I made sure the character should be an average sized female and it must fit for most of the female user.

I also made sure that the model is just a placeholder in this project which helps the outfit to wrap around it.



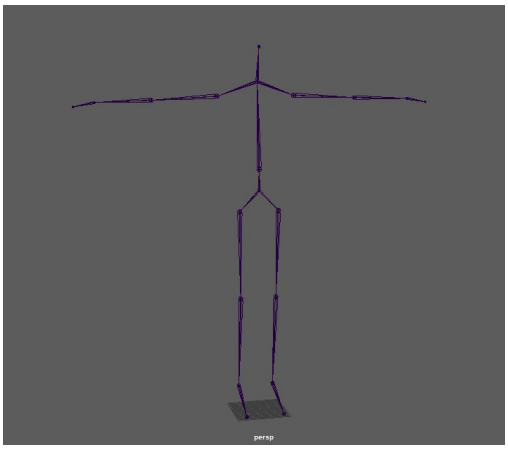
Since this model must be rigged as well, I also made sure all the loops and edges are well defined and gives a better form for the 3D asset.

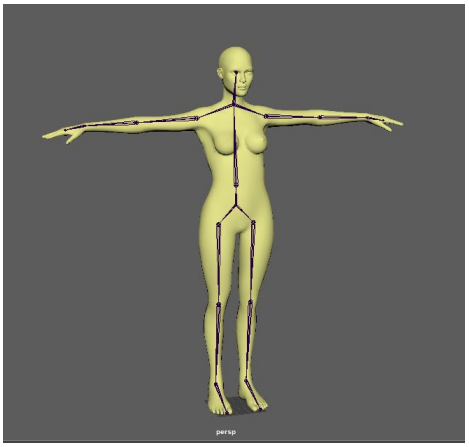


This 3D model is then sent to the 3D artist to model the outfit such a way it fits this model.

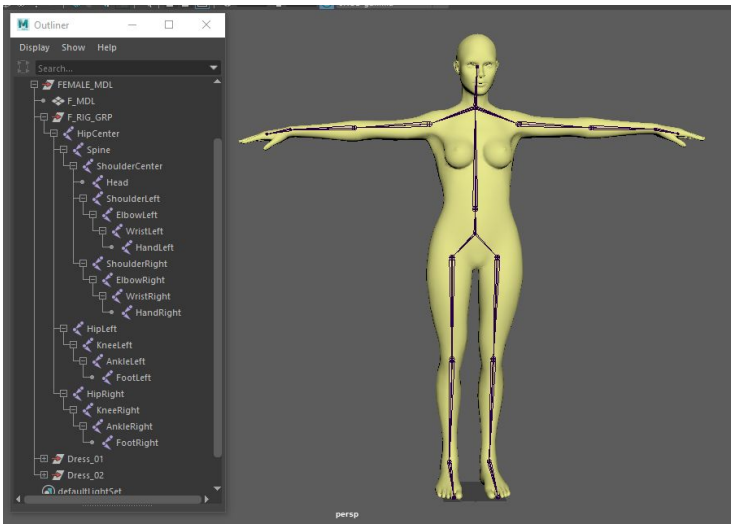
Rigging

As a rigger, I made sure all the model loops were fit to rig, and I also made sure that the 3D engine supports the rig system which I provide. I worked closely with the application developer and gathered few inputs about the naming convention that fits for the 3D engine.





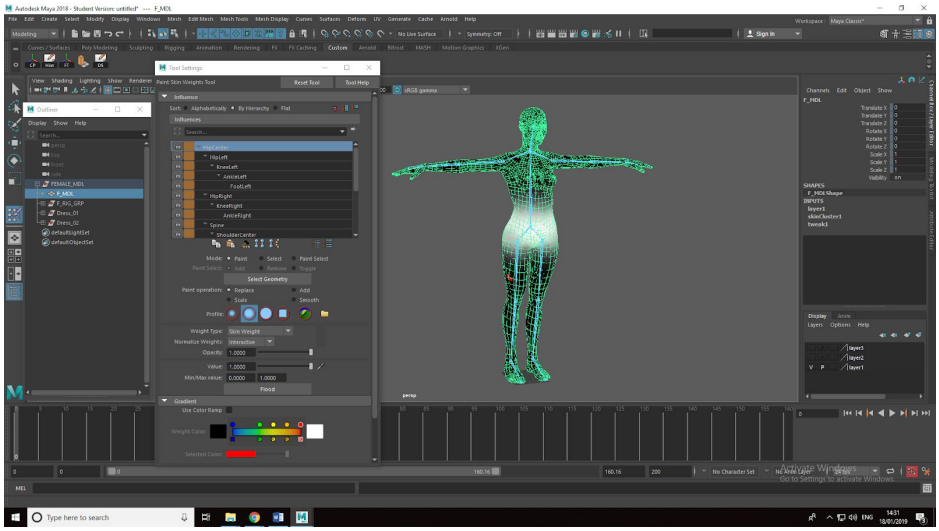
As all the bones were placed, the model is aligned with the bone setup also the naming conversion is made sure intact with Unity.



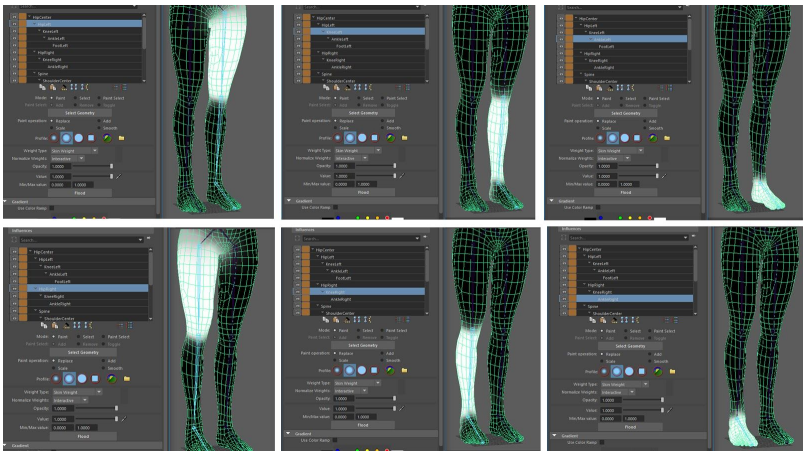
Skinning

As the rigging is done, the file is moved one step further into the skinning pipeline. This is the place where the 3D model is connected with the bone setup and every bone is allocated with different vertices to take control.

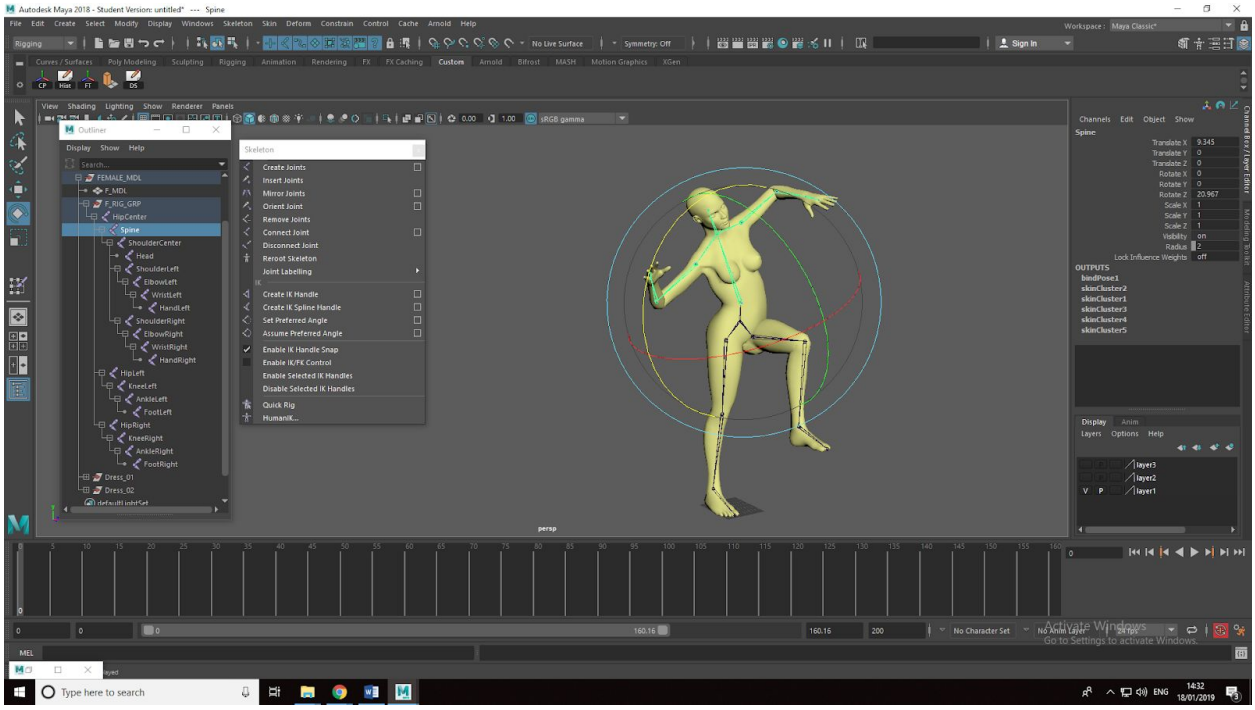
This is done by painting over the model with the white paint. As you can see below image, that the hip joint is controlling the vertices around it as it is painted white.



As each and every joint is painted with the vertices, all the joints are ready to move the mesh and mimic the user in every action.

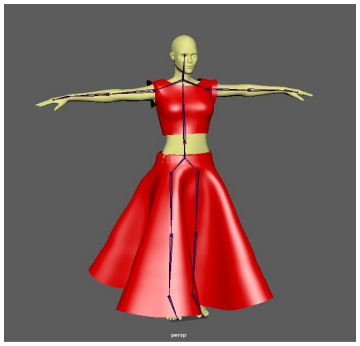


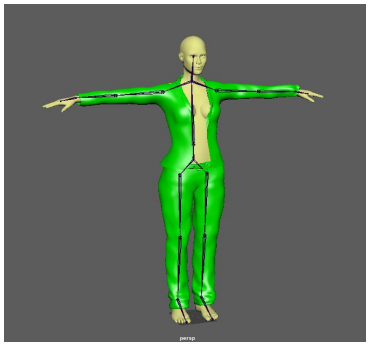
Finally, the model is monkey tested with various random poses to check if the model does not break during the simulation. As the rig is finally done, the outliner is cleaned up and it is ready to move on to the pipeline.



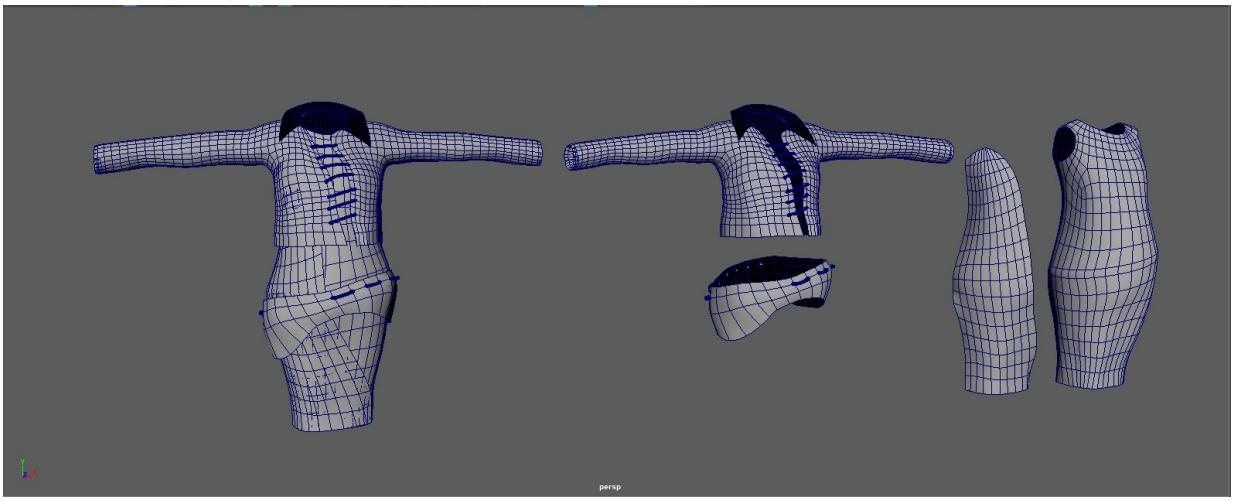
Binding the Cloths

This is the crucial part in the over all pipeline. The outfits are imported from the 3D artist and it is ready to hang onto the 3D model.

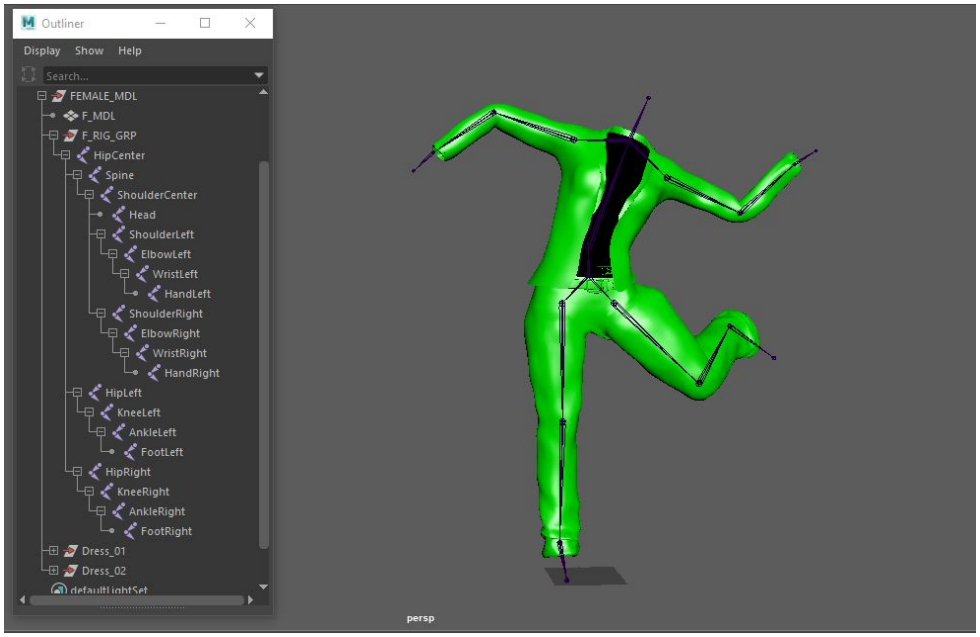




All the models are color coded to check the penetration with the 3D model.



All the loops and vertices are double checked to avoid penetration and loop flow. As the above outfit is designed by the fashion designer, I made sure the fashion designer is looped in to check the flow of the model and it is exactly as the designer imagined.



Finally, all the outfits are binded to the 3D model. Each model is monkey tested separately to check if there is any bad deformation.

At last, the file is cleaned up and the outliner is cleaned up and it is ready to move on the pipeline.

Conversion and Export

The model is exported in FBX format. As FBX is the only extension the supports a model, rig and animation. So this is mainly implemented with the workflow to make the transition seamless.

Few of the setting were sure that the model does not break when is it imported in the 3D engine. All the shaders and textures are exported along with the model as given by the 3D artist.

Implementation

As all the pieces are made in the different areas, Unity is the place where things all come together. This implementation is taken with much care from the starting and I made sure all the files are in proper file naming and right format.

As I get the green light from the application developer, the implementation is done with all the coding.

Conclusion

As my role and responsibility is to design the paper prototype and guide the UI designer on what to design for the UI and make sure the 3D artist creates the 3D assets as required for the 3D engine. I, finally made sure all the files and assets gets imported into the 3D engine seamlessly and all the software and hardware works like a well-oiled machine.

As a game designer, the role I played in this project is little different as because the project demanded my other set of skills which I was prepared with my sharpened tools. I had a big opportunity in exploring with the designs and implementation of this project. I must thank all the team members and the mentor who guided us along the way to complete this project on time.

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