# Virtual Online Shopping—Ecommerce from a wider angle

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## Project Outline:

During COVID19, online retail is as strong as ever. I'm exploring the use of Virtual Reality in order to support both retail stores and customers. Real time simulation of clothing can contribute to this – people are more likely to buy items if they can examine the clothing like they would before the pandemic started – this includes identifying the fit and colour for example. My aim is to simulate high street shopping but from the comfort of the users home.

- The main aspect of the project is having the ability to view clothing items in Virtual Reality. It will have a specific area to filter down the clothing choices and the option to view them on a model of your choice.
- Manipulate the model by changing poses and spinning them around for the full 360 angle.
- The user can customise the model to match their measurements to see how the clothing looks using sliders.
- There is also a range of preset models to quickly choose from. Presets are based from a range of body types and popular options, such as curvy, petite and maternity.
- There is surrounding functionality for ease of use including a save feature. This allows the user to take away the outcome of the application to then purchase the items if they so wish.
- There will be a large range of clothing to choose from—using the entire ASOS catalogue.

## Technical details:

Blender and Gimp are used to create and texture the 3D models. They are free open source tools. They contain all the relevant tools to create 3D models and create UV maps to accurately display the clothing.

Textures will be created by analysing the clothing images provided, copying and using logos's and creating bump/ height maps for extra realism.

The application is made in Unity 2019.4.13f, using the OpenXR ( previously known as SteamVR) package for VR support. I chose the engine because I know it can handle real-time rendering without disturbing the applications performance to an extent. It also supports cloth  physics which is a key feature to check the fit of the clothing.

The VR hardware used to develop this is the HTC Vive which is supported by OpenXR/SteamVR.

All the software works together to create the application, for example:

- Clothes are created in Blender, textured in GIMP, exported into Unity and created into a object that can be loaded on runtime.

The dataset is originally fetched from the ASOS api—the relevant data is read in once with an python application and displayed as an object in Unity using C#. Figure 1 shows how it integrates into the overall application.

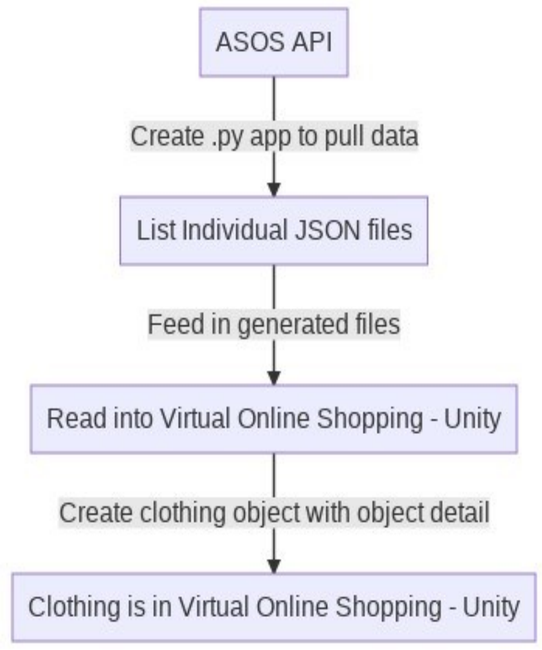


Figure 1: Data API flow diagram

## Progress achieved:

- Fully planned/realised environment.
- Basic GUI Implemented.
- Customisable models via VR sliders.
- Model Presets and fully rigged models.
- Data internally stored and assigned to clothes.

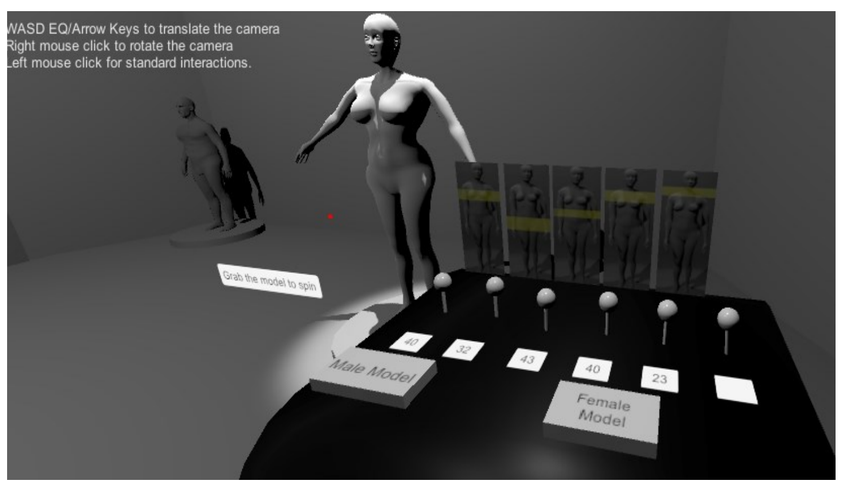


Figure 2: Virtual Online Shopping  application

## Remaining Work:

- Filter clothing items per the users choices.
- Display clothing in the scene.
- Display clothing items on the model.
- Saving user preferences.
- Option to change model poses.
- Texture the application  - the environment and all the clothing objects.

## What is Virtual Reality?

"Computer-generated simulation in which a person can interact within an artificial three-dimensional environment using electronic devices, such as special goggles with a screen or gloves fitted with sensors."

- https://www.investopedia.com/terms/v/virtual-reality.asp

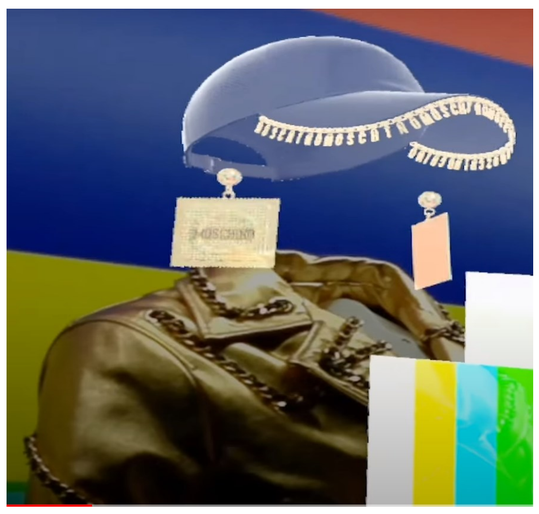

Figure 3: https://wwd.com/fashion-news/fashion-scoops/hm-creates-augmented-reality-experience-for-moschino-collab-1202891622/

## Further Information:

The concept of clothing in Mixed Reality has been explored by a number of brands such as Zara, Topshop and GAP. There has even been a fashion show in Virtual Reality hosted by Topshop itself. See Figure 4.

The idea to create this application stemmed from the examples above and the potential they have. Another reason to create this is because ordering online is unreliable—due to sizing and flawed clothing photos. It is more difficult to judge how an item will fit when models are in quirky positions for example.

Figure 4: http://retail-innovation.com/topshop-use-virtual-reality-headsets-for-catwalk