

This week we developed our first recommendation model based on what we have learned and analyzed so far in the recommendation system. First of all, the VGG16 model was designed. The designed model has 0 trainable parameters, 14,714,688. 0 trainable parameters means that the weights in the model are not trainable, i.e. they will not be updated during training. This is often the case when we are using a pre-trained model (in this case VGG16) and we want to freeze the weights of that model. Freezing the weights of the model ensures that the weights of the lower layers of the model are not updated during training. This is often used in combination with a technique called feature extraction.

The extracted features are too high dimensional to be given as input to the KNN algorithm. PCA was used for dimensionality reduction. PCA is often used to reduce high-dimensional data sets to lower dimensions. This makes the data easier to visualize and also allows some machine learning algorithms to run faster. In our study, we set the PCA algorithm to create two main components (or dimensions), which reduces the number of features in the dataset to two. Our aim here is to reduce the noise in the dataset and preserve the most important features, based on what we know from the literature.

The final version of the dataset was fed into the KNN algorithm to show several other products similar to a product, a few examples are shown Figure 1.



Figure 1: Recommended Products

In the coming week, we aim to carry out detailed studies on the algorithms and model layers in the developed recommendation system. The process of developing the recommendation system can be found on Github source [1].

## References

- [1] Github Source: <https://github.com/ogulcanakcaa/Fashion-Recommendation-System/blob/main/Codes/pca-knn-vgg16.ipynb>