Smart Fashion Recommender Application

Abstract:

In recent years,the textile and fashion industries have witnessed an enormous amount of growth in fast fashion.With an increase in the standard of living, peoples' attention gradually moved towards fashion that is concerned to be a popular aesthetic expression. Humans are inevitably drawn towards something that is visually more attractive. This tendency of humans has led to the development of the fashion industry over the course of time. However, given too many options of garments on the e-commerce websites, has presented new challenges to the customers in identifying their correct outfit. Thus, in this project, we proposed a personalized Fashion Recommender system that generates recommendations for the user based on an input given. Unlike the conventional systems that rely on the user's previous purchases and history, this project aims at using an image of a product given as input by the user to generate recommendations since many-a-time people see something that they are interested in and tend to look for products that are similar to that. We use neural networks to process the images from Fashion Product Images Dataset and the Nearest neighbour backed recommender to generate the final recommendations.

Keywords: fashion recommendation system, e-commerce,filtering techniques,algorithmic models,performance.

Introduction:

Humans are inevitably drawn towards something that is visually more attractive.Clothing is a kind of symbols that represents people's internal perceptions through their outer appearance.It conveys information about their choices,faith,personality,profession,social status and attitude towards life.Therefore,clothing is believed to be a non-verbal way of communicating and a major part of people's outer appearance.Recent technological advancements have enabled consumers to track current fashion trends around the globe,which influence their choices. This tendency of humans has led to development of fashion industry over the course of time. With introduction of recommender systems in multiple domains, retail industries are coming forward with investments in latest technology to improve their business. Fashion has been in existence since centuries and will be prevalent in the coming days as well. Women are more correlated with fashion and style, and they have a larger product base to deal with making it difficult to take decisions. Therefore, e-commerce has become the predominant channel for shopping in recent years. The ability of recommendation systems to provide personalized recommendations and respond quickly to the consumer's choices has contributed significantly to the expansion of e-commerce sales . According to different studies, e-commerce retailers, such as Amazon, eBay, and Shopstyle, and social networking sites, such as Pinterest, Snapchat, Instagram, Facebook, Chictopia, and Lookbook, are now regarded as the most popular media for fashion advice and recommendations . Research on textual content, such as posts and comments , emotion and information diffusion and images has attracted the attention of modern-day researchers, as it can help to predict fashion trends and facilitate the development of effective recommendation systems . An effective recommendation system is a crucial tool for successfully conducting an e-commerce business. Fashion recommendation systems (FRSs) generally provide specific recommendations to the consumer based on their browsing and previous purchase history. Social-network-based FRSs consider the user's social circle, fashion product attributes, image parsing, fashion trends, and consistency in fashion styles as important factors since they impact upon the user's purchasing decisions . FRSs have the ability to reduce transaction costs for consumers and increase revenue for retailers. With the exception of a single study from 2016 that focuses only on apparel recommendation systemsIt has become an important aspect of life for modern families since a person is more often than not judged based on his attire. Moreover, apparel providers need their customers to explore their entire product line so they can choose what they like the most which is not possible by simply going into a cloth store.

Related work:

In the online internet era, the idea of Recommendation technology was initially introduced in the mid-90s. Proposed CRESA that combined visual features, textual

l attributes and visual attention of the user to build the clothes profile and generate recommendations. Utilized fashion magazines photographs to generate recommendations. Multiple features from the images were extracted to learn the contents like fabric, collar, sleeves, etc., to produce recommendations. In order to meet the diverse needs of different users, an intelligent Fashion recommender system is studied based on the principles of fashion and aesthetics. To generate garment recommendations, customer ratings and clothing were utilized in The history of clothes and accessories, weather conditions were considered in to generate recommendations.

Getting the inventory:

The images from Kaggle Fashion Product Images Dataset. The inventory is then run through the neural networks to classify

and generate embeddings and the output is then used to generate recommendations. The Figure shows a sample set of inventory data

Figure 3. Sample inventory data

Recommendation generation:

To generate recommendations, our proposed approach uses Sklearn Nearest neighbours Oh Yeah. This allows us to find the nearest neighbours for the given input image. The similarity measure used in this Project is the Cosine Similarity measure. The top 5 recommendations are extracted from the database and their images are displayed.

Experiment and results:

The concept of Transfer learning is used to overcome the issues of the small size Fashion dataset. Therefore we pre-train the classification models on the DeepFashion dataset that consists of 44,441 garment images. The networks are trained and validated on the dataset taken. The training results show a great accuracy of the model with low error, loss and good f-score.
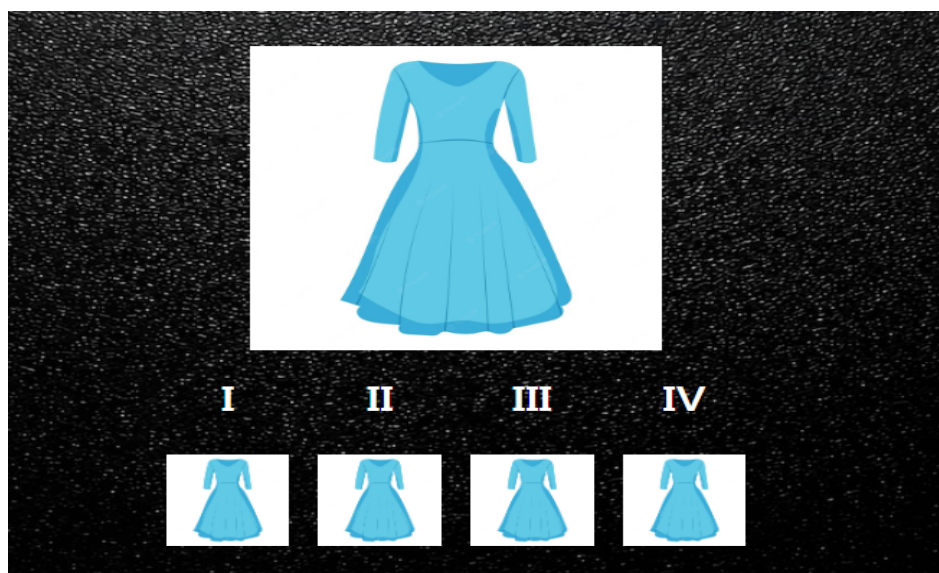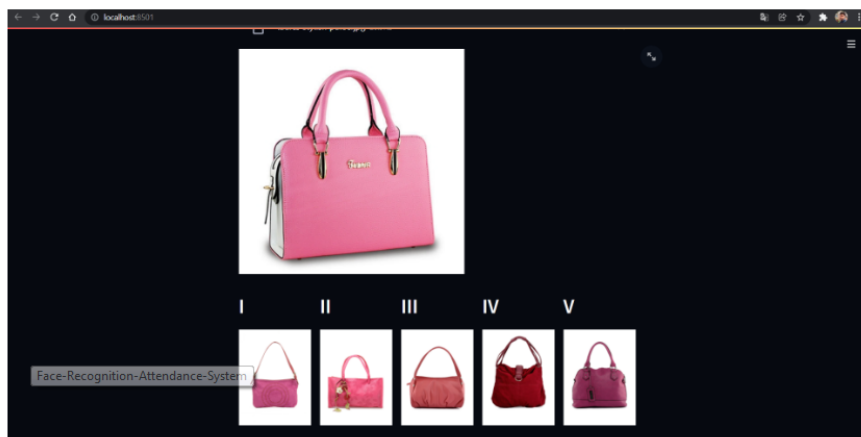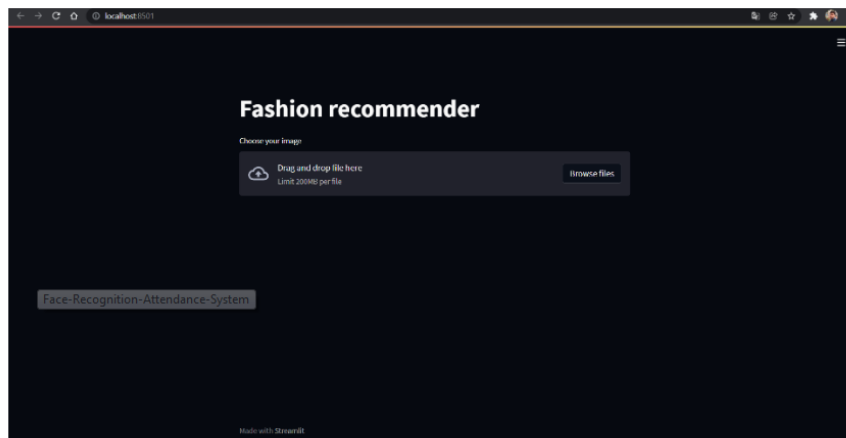
Dataset Link:

Kaggle Dataset Big size 15 GB

Kaggle Dataset Small size 572 MB

Screenshots:

Simple App UI

Outfits generated by our approach for the given input image

Installation:

Use pip to install the requirements.

pip install -r requirements.txt

Usage:

To run the web server, simply execute streamlit with the main recommender app:

streamlit run main.py

Built With:

- [OpenCV](#) - Open Source Computer Vision and Machine Learning software library
- [Tensorflow](#) - TensorFlow is an end-to-end open source platform for machine learning.
- [Tqdm](#) - tqdm is a Python library that allows you to output a smart progress bar by wrapping around any iterable.
- [streamlit](#) - Streamlit is an open-source app framework for Machine Learning and Data Science teams. Create beautiful data apps in hours, not weeks.
- [pandas](#) - pandas is a fast, powerful, flexible and easy to use open source data analysis and manipulation tool, built on top of the Python programming language.
- [Pillow](#) - PIL is the Python Imaging Library by Fredrik Lundh and Contributors.
- [scikit-learn](#) - Scikit-learn is a free software machine learning library for the Python programming language.
- [opencv-python](#) - OpenCV is a huge open-source library for computer vision, machine learning, and image processing.

Conclusion:

In this project, we have presented a novel framework for fashion recommendation that is driven by data, visually related and simple effective recommendation systems for generating fashion product images. The proposed approach uses a two-stage phase. Initially, our proposed approach extracts the features of the image using CNN classifier ie., for instance allowing the customers to upload any random fashion image from any E-commerce website and later generating similar images to the uploaded image based on the features and texture of the input image. It is imperative that such research goes forward to facilitate greater recommendation accuracy and improve the overall experience of fashion exploration for direct and indirect consumers alike.