Fashion Recommender system

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.

Introduction

Humans are inevitably drawn towards something that is visually more attractive. 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. It 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 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.

Proposed methodology

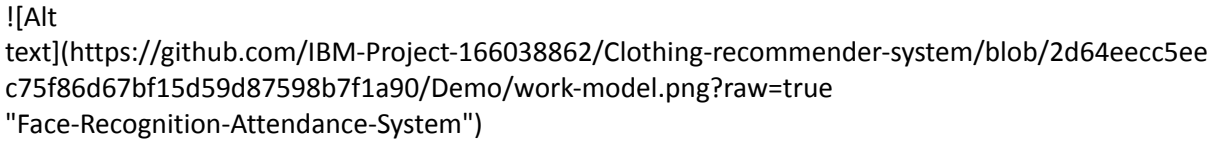
In this project, we propose a model that uses Convolutional Neural Network and the Nearest

neighbour backed recommender. As shown in the figure Initially, the neural networks are trained and then

an inventory is selected for generating recommendations and a database is created for the items in

inventory. The nearest neighbour's algorithm is used to find the most relevant products based on the

input image and recommendations are generated.



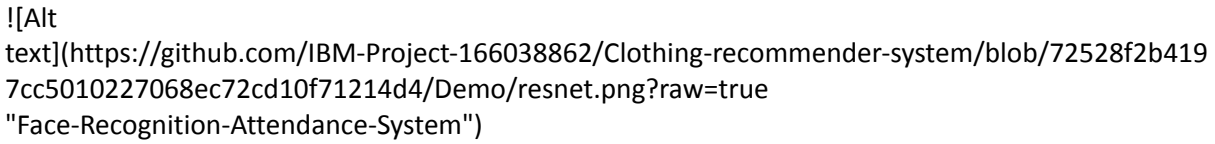
Training the neural networks

Once the data is pre-processed, the neural networks are trained, utilizing transfer learning

from ResNet50. More additional layers are added in the last layers that replace the architecture and

weights from ResNet50 in order to fine-tune the network model to serve the current issue. The figure

shows the ResNet50 architecture.



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The images from Kaggle Fashion Product Images Dataset. The

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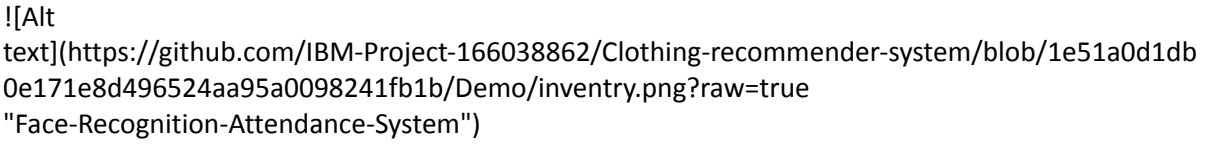

Recommendation generation

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](https://www.kaggle.com/paramaggarwal/fashion-product-images-dataset)

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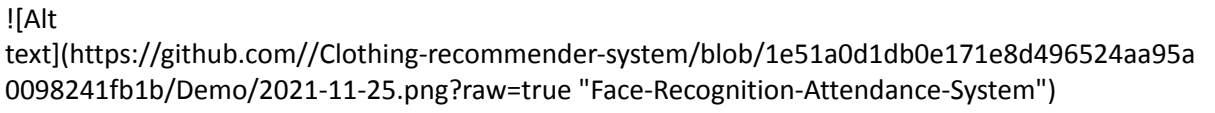
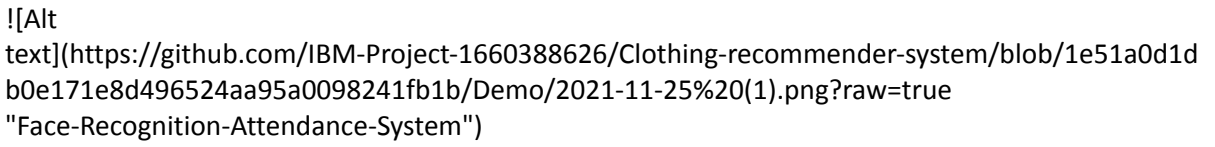
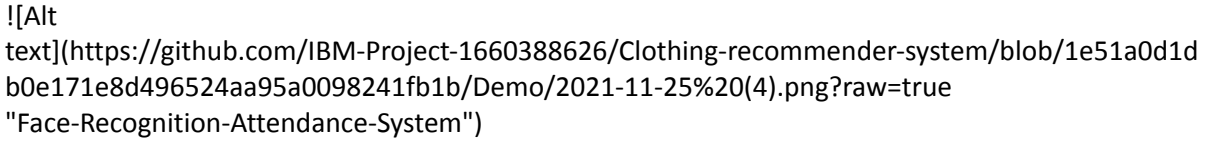
Screenshots

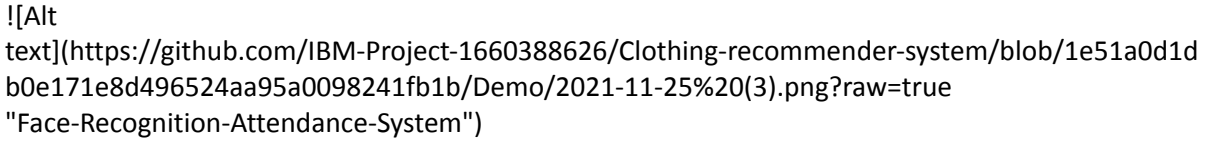
Simple App UI



Outfits generated by our approach for the given input image







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Use pip to install the requirements.

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Usage

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

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Built With

- [OpenCV]() - Open Source Computer Vision and Machine Learning software library

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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

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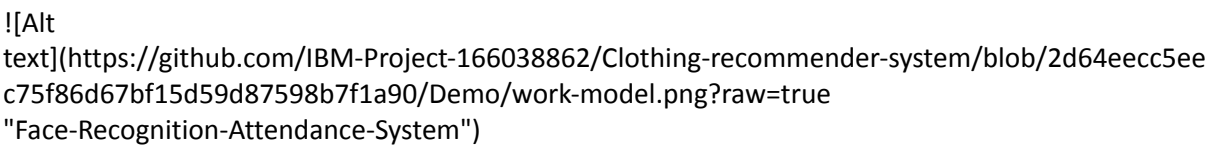

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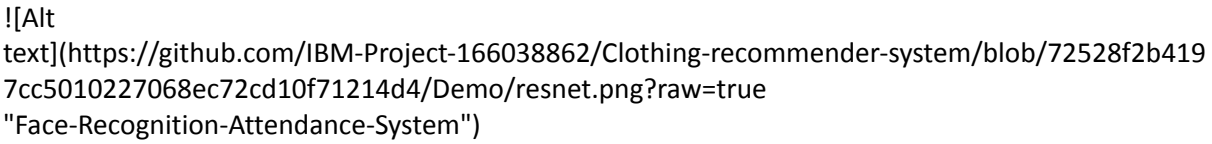

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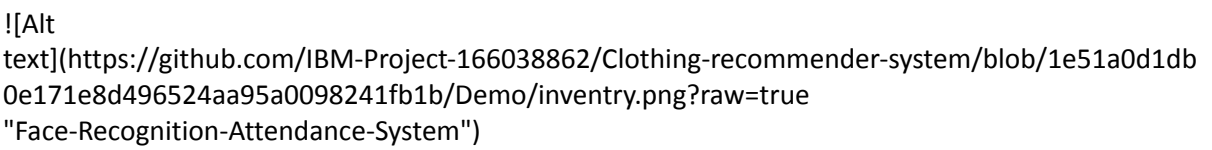

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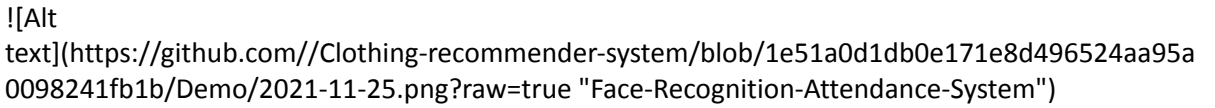

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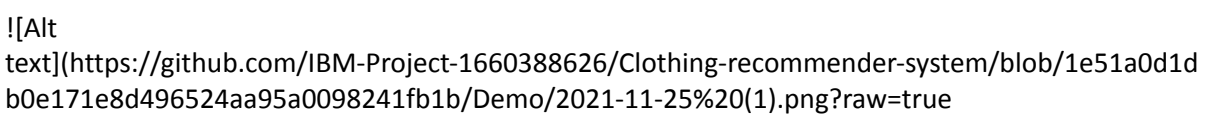

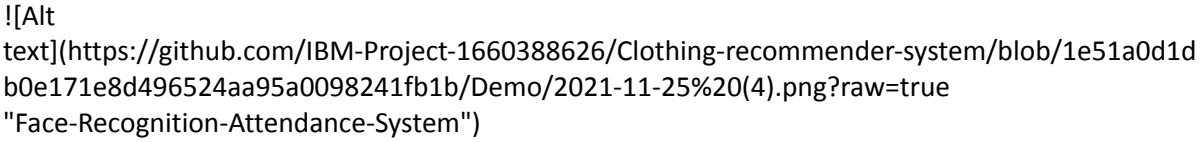

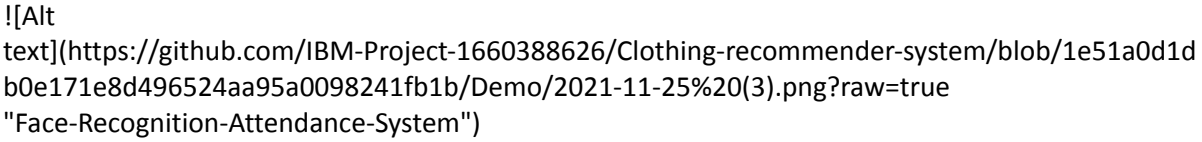

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