# Textile Products Recommendation System in Online Using Deep Learning

[1]kalavena Ramya [2]P.Sathish

[12] Vaageswari College Of Engineering, karimnagar, Telangana, India

[1]ramyakalavena124@gmail.com [2]polu.sathish99@gmail.com

**ABSTRACT_** The popularity of recommendation systems has increased in recent years as a means of guaranteeing customer satisfaction and driving revenue growth. The goal of these technologies is to let customers make decisions more quickly. These recommendation systems are particularly important in the realm of online retail. This research proposes a Convolutional Neural Network-based deep learning online recommendation device (CNN). Users and designers of the CNN have collaborated to determine which classes of special patterns should be implemented inside the network's architecture. The in-depth learning model suggests color-balanced layouts for tangible goods. In order to train and test the proposed model, we used our own sample dataset consisting of 12000 images.

## 1.INTRODUCTION

Online shopping has been increasing in popularity recently because of the way internet technology is evolving. The majority of shoppers who purchase new products do so because they like the way the colour or sample looks with their existing inventory. Shopping online is convenient, but it can be time-consuming to look for similar items. Discovering the many patterns that clients are interested in can be expedited by using an automated advising structure. Suggestion systems are becoming popular because they allow shoppers to quickly sort through a wide range of available online products and zero down on the ones that best suit their needs [1]. Researchers have taken notice of recommendation structures, leading to the introduction of domain-specific recommendation structures in fields including film [2], video [3], music [4], fashion [5, 6, 7], and so on.

## 2.LITERATURE SURVEY

While the construction of recommendation systems is not new, there have been some previous works on the topic.

In order to recommend a cloth, we create a deep learning system that uses two inceptions-based convolutional neural networks for the prediction part and one feed forward neural network for the recommender. As a result of our research, we are able to predict colours with 98% precision, determine a person's gender and clothing pattern with 86% precision, and make fashion recommendations with 75% precision. However, the clothes vector frequently suggests items that do not match because of the mingled information of style and category. We propose a style feature extraction (SFE) layer to solve this issue by parsing the clothing vector into sub-vectors representing different styles and categories. We remove the category information from the clothing vector to get more precise fashion information, based on the fact that category information exhibits small variations within the same class while distinguishing between other classes..

## 4.PROPOSED SYSTEM

Referring to Fig. 1, we can see the overall structure of the proposed recommendation system. The image shows how a customer who wants to buy a matching throw pillow for their sofa would go about doing so. After a photo of the desired pillow purchase is uploaded to the system, the image is integrated with patterns from a database and then given to a deep learning algorithm. Images that have been merged with various patterns are analysed by a deep learning algorithm, and the ones that are most likely to be of interest to the user are returned to them.

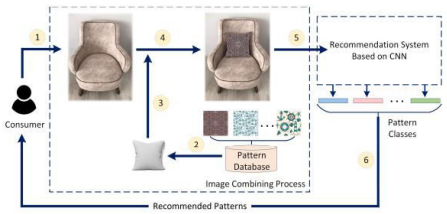



Fig. 1. The proposed recommendation system architecture.

## 5.PROPOSED ALGORITHM

1. Data Collection
2. DataPreparation:Data augmentaion.resize,
3. Model:CNN using traing data
4. Prediction on testing data

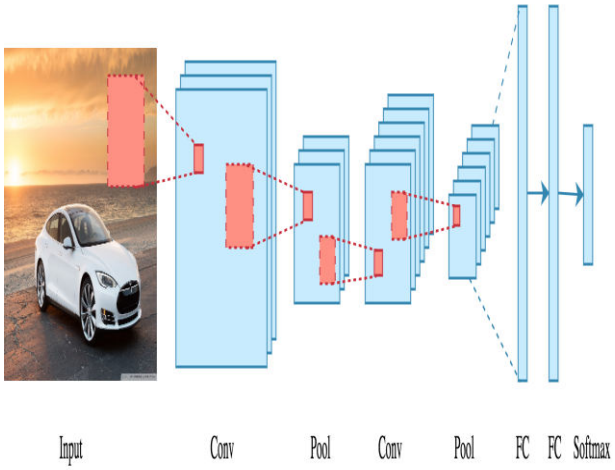
I can't get away from CNN. It's widely considered the gold standard of deep learning frameworks. It is largely due to the widespread use and proven success of convnets that deep learning has recently gained prominence. AlexNet sparked a renewed interest in CNN in 2012, and the field has only flourished from there. The development time between 8-layer AlexNet and 152-layer ResNet by researchers is just three years.

CNN has quickly become the standard approach for any kind of image processing work. When compared to rivals, they are miles ahead in terms of precision. It's also been successfully

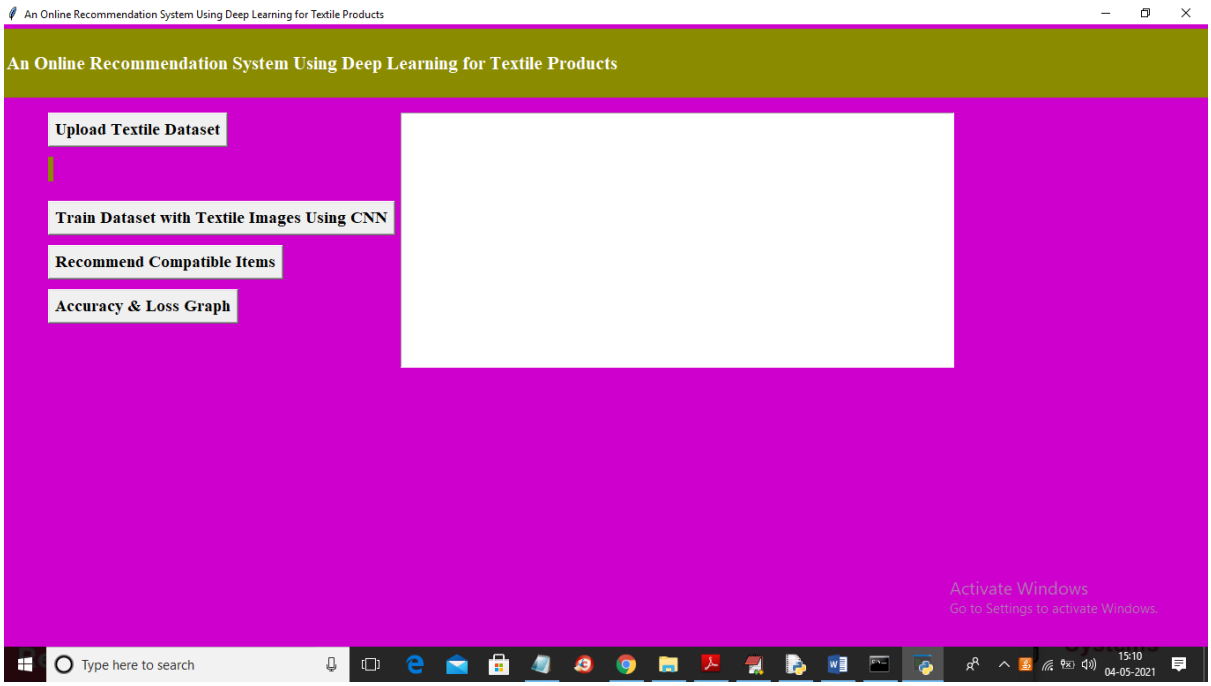
used in other contexts, like NLP and recommendation engines. CNN's key benefit over its forerunners is that it can recognise important elements automatically, without human intervention. When presented with several images of cats and dogs, for instance, it quickly picks up on the differences between the two classes.

Additionally, CNN has low computational costs. Unique convolution and pooling operations, as well as parameter sharing, are used. This makes it possible for CNN models to function on any device, increasing their appeal.

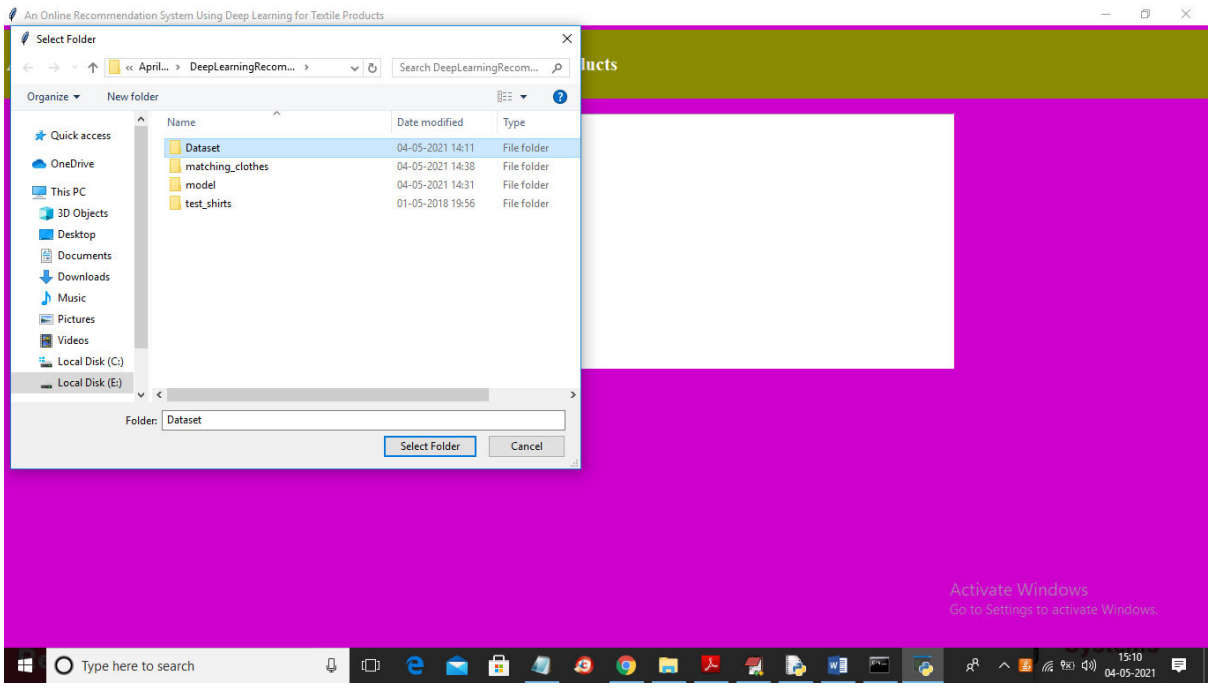
Everything about this appears magical. We have here a very potent and effective model that, by means of automatic feature extraction, achieves superhuman precision (yes CNN models now do image classification better than humans). With any luck, the information presented here will allow us to better understand this unique method..



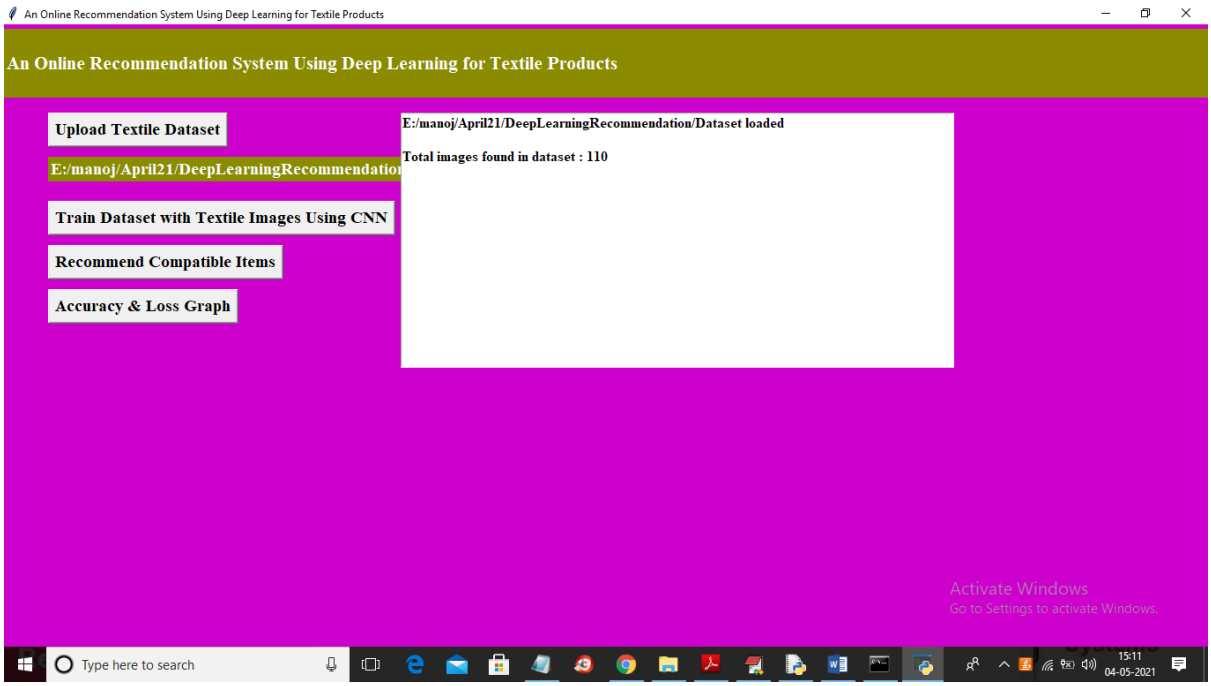

**4.RESULTS AND DISCUSSIONS**



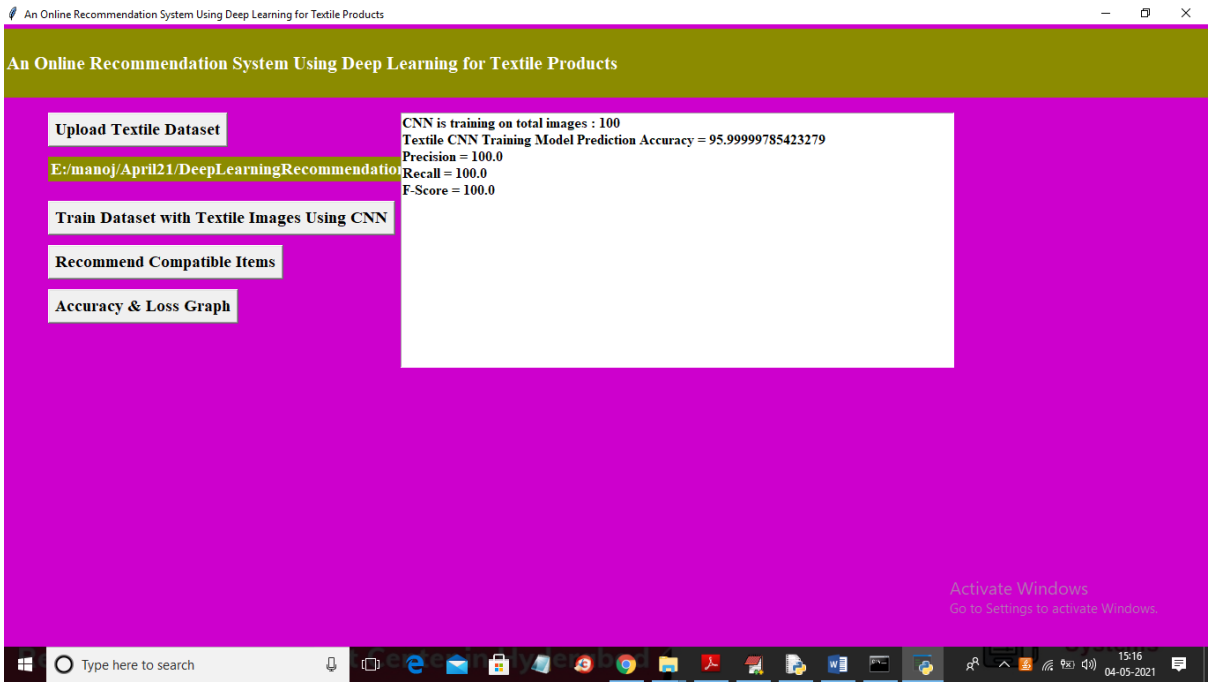

In above screen click on 'Upload Textile Dataset' button to upload dataset



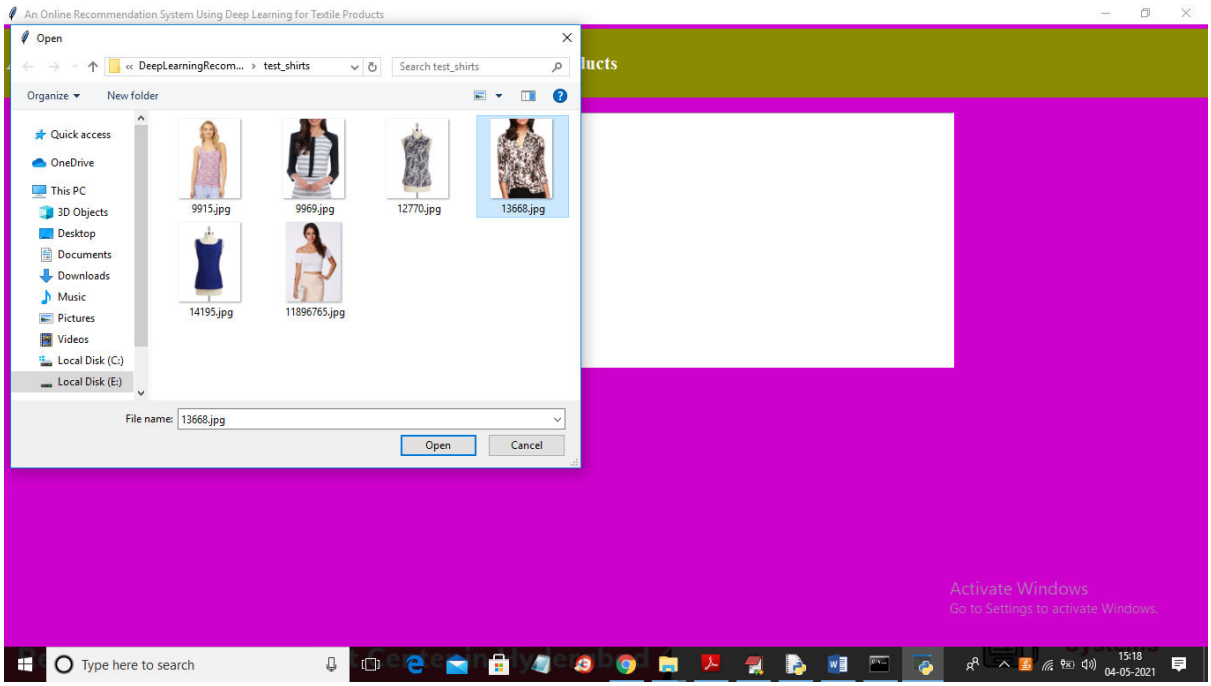

In above screen selecting and uploading 'Dataset' folder and then click on 'Select Folder' button to load all training images to application and to get below screen



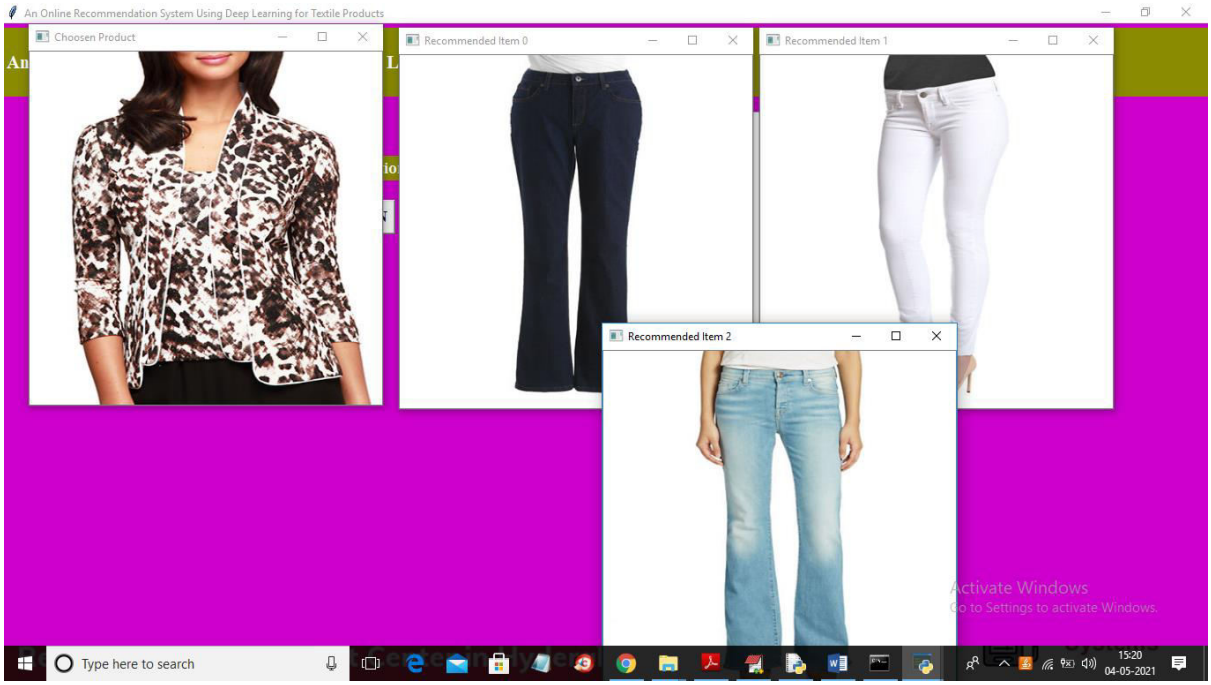

In above screen dataset loaded and this dataset contains total 110 images and now click on 'Train Dataset with Textile Images Using CNN' button to train CNN with above images and then calculate its prediction accuracy on test data



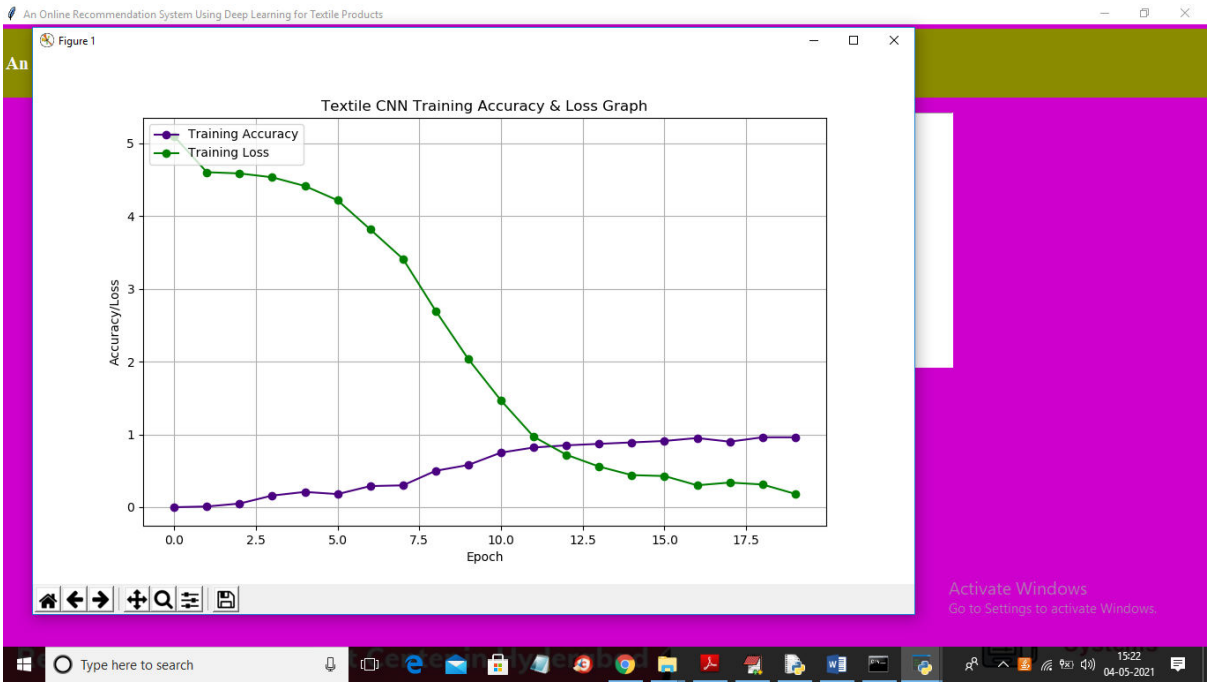

In above screen we got CNN accuracy on textile dataset as 95% and precision, recall and FScore as 100%. Now model is ready and now click on 'Recommend Compatible Items' button to upload test image and then CNN will recommend matching patterns PANTS




In above screen I am uploading '13668.jpg' file and then click on 'Open' button to get below recommendation list




In above screen first image is the user selected image and then next 3 images are the pattern matching recommendation list for user selected shirt. Now close above images and similarly you can upload other images and test. Now click on 'Accuracy & Loss Graph' button to get below graph




In above graph x-axis represent Epoch and I took 20 epoch/iterations and y-axis represents accuracy and loss values and in above graph green line represents CNN MODEL LOSS and blue line represents accuracy and in above graph we can see with each increasing epoch CNN LOSS is reduce and accuracy gets increase which means generated model is accurate in prediction

## 6.CONCLUSION

To help designers choose complementary hues while creating new items, we've developed a tool based on the principles of convolutional neural networks (CNNs). When learning and testing the CNN model, we relied on our own sample dataset consisting of 12000 images. Conventional criteria such as accuracy, precision, recall, and the f1 rating were used to evaluate the proposed model. The final results included a f1-score of 82.30%, an accuracy rate of 82.08%, a precision rate of 82.00%, a recall rate of 83.50%, and an accuracy rate of 82.08%. Even though photographs are quickly categorised based on the preferences of the consumers and designers rather than the attribute similarities of the images, guidelines appear to offer appropriate patterns. Consumers' product purchases and rankings might be interpreted as input to the recommendation system because they reveal consumers' tastes. The suggestion device is trained again and again with the help of the feedback it receives during specific

time intervals. Feeding the feedback into the advice system will improve its overall performance.

**REFERENCES**

[1] W. Zhou, P. Y. Mok, Y. Zhou, Y. Zhou, J. Shen, Q. Qu, and K. P. Chau, "Fashion recommendations through cross-media information retrieval," J. Visual Commun. Image Represent., vol. 61, pp. 112– 120, 2019.

[2] L. Zhao, Z. Lu, S. J. Pan, and Q. Yang, "Matrix factorization+ for movie recommendation," In IJCAI, pp. 3945–3951, July 2016.

[3] P. Covington, J. Adams, and E. Sargin, "Deep neural networks for youtube recommendations," In Proceedings of the 10th ACM conference on recommender systems, pp. 191–198, September 2016.

[4] X. Wang, and Y. Wang, "Improving content-based and hybrid music recommendation using deep learning," In Proceedings of the 22nd ACM international conference on Multimedia, pp. 627–636, November 2014.

[5] Y. Guan, Q. Wei, and G. Chen, "Deep learning based personalized recommendation with multi-view information integration," Decision Support Systems, vol. 118, pp. 58–69, 2019.

[6] Q. Liu, S. Wu, and L. Wang, "DeepStyle: Learning user preferences for visual recommendation," In Proceedings of the 40th International ACM SIGIR Conference on Research and Development in Information Retrieval, pp. 841–844, August 2017.