SMART FASHION RECOMMENDER APPLICATION

A PROJECT REPORT

Submitted by

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In partial fulfillment for the award of degree of Bachelor of Technology (B.Tech) in Information Technology

ANNAI COLLEGE OF ENGINEERING AND TECHNOLOGY

ANNA UNIVERSITY NOVEMBER 2022

ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to our Faculty Mentor and Industry Mentor for their support and guidance in completing ourproject ontheSmartFashionRecommender Application.

We would like to extend our gratitude to providing us with all the facility that was required.

It was a great learning experience.We would like to take this opportunity to express our gratitude.

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DATE:

17/11/2022

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TITLE

ABSTRACT

In recent years, the huge amount of informaton and users of the internetservice, it is hard to know quickly and accurately what the user wants. This phenomenonleads to an extremely low utlizaton of informaton, also known as the informaton overloadproblem.Traditonally,keywordsareusedtoretrieveimages,butsuchmethodsrequirealotofannotatonsontheimagedata,whichwillleadtoseriousproblemssuchasinconsistent, inaccurate, and incomplete descriptons, and a huge amount of work. To solvethis problem, Content Based Informaton Retrieval (CBIR) has gradually become a researchhotspot. CBIR retrieves picture objects based entrely on the content. The content of animage needs to be represented by features that represent its uniqueness. Basically, anypictureobjectcanberepresentedbyitsspecifcshapes,colours,andtextures.Thesevisual characteristcs of the image are used as input conditons for the query system, and aresult the system will recommended nearest images and data set. This research designsand implements two-stage deep learning-based model that recommends a clothing fashionstyle. This model can use deep learning approach to extract various atributes from imageswith clothes to learn the user's clothing style and preferences. These atributes are providedto the correspondence model to retrieve the contguous related images for recommendaton.Based on data-driven, this thesis uses convolutonal neural network as a visual extractor ofimageobjects. Thisexperimental modelshowsandachievesbeterresultsthantheonesofthepreviousschemes.

Recommendation systems are the techniques that are used to predictthe rating one individual will give to an item or social entity. The items can includebooks,movies,restaurantsandthingsonwhichindividualshavedifferentpreferences. These preferences are being predicted using two approaches frstcontent-based approach which involves characteristics of an item and secondcollaborativeflteringapproacheswhichconsidersuser'spastbehaviourtoevaluate its choices. This thesis proposes a fashion recommendation systemwhich will recommend clothing images supported the style sort of the providedclothingimages.Inthiswork,wefocuson theimagesofupper bodyaswellas

the lower body clothing and with human model in the images. We have createdour own datasets through web scrapping of different ecommerce websites. In thispaper we have come up with an idea to build a content-based recommendationsystemusingResNet-50convolutionalneuralnetwork.

Keywords:ClothRecommendation,ConvolutionalNeuralNetwork,SimilarityMeasure.

Introduction

During the last years, online shopping has been growing. In 2013, the total turnover forecommerce in Europe expanded with 17% in contrast to the 12 months before and hugeorganizatons can have hundreds and hundreds of products or even more from which wecan select on websites. Both the customer and the business enterprise desire the client toeasily discover applicable products or items both throughout search and when they aresearching, and this is where recommender systems come into the picture. The greater part(62%) of US buyers with Web access presently shop on-line, to some degree, at least amonth,and1%saytheydonotbuyfrominternet,asindicatedbyacurrentreportbyWalkerSands.F romalltheclientslookingforitemsontheweb,63%ofthembuygarments(Burke,2002),thesebeing, quitepossibly,themostpurchaseditems.Theinformaton uncover that women are more likely tobuy on-line, with71%ofladies doingthis, contrasted with 52% of men. Studies on clothing are in a growing development ingeneral as a result of the tremendous market related to dress. In China, the serviceablemarket crushed 20 billion US dollars in 2016. Picture recovery can be depicted as theerrand of looking out for pics in a picture data set. This is present not an astute thought, inlight of everything. It has been explored on account of the way that the 1970s joinedinformatonalcollectonassociatonswithPCvision,lookingintotheissueasindicatedthrough two uncommon perspectves, the frst being text-based and the second one beingvisual-based. From the outset, the developments have been made only through informatonannotatons that have been saved in a database to work the retrieval step, however, whenthe dimension of the image collectons started to amplify the efort required to label themused to be as soon as unsustainable, to solve this issue, during the 1990s, content-basedphotographretrievalwasproposed.Startngnowmany searched for lines have seemed the use of one or the diferent isolated or combiningthem. Recommendaton systems make recommendatons based on the informaton theyare provided with and in the manner in which they are programmed. Going into details,mostoftheevaluatonappliedisindependentcomingupwithabrand-newrecommendatonalgorithm,system,ormodel.However,diferentresearchersusealready existng work as researchers use an already existng current piece of work tocome up with a new diagram or to truly improve the current one. The present analysismodel focuses on the use of a current algorithmic program and, consequently, the useofanewresearchconceptcomesupwitharecommendersystem.Existngresearchand fashions have given us some inspiratons of how to design fashion recommendatonsystems. Nevertheless, they also involve some common drawbacks. Therefore, in thisstudy, our aim to suggest a new method to assist personal choice making throughsupplyingimagesandgetsuggestonsbasedonprovidedcontents.

Thecontributonoftheresearcharefollows:

- To design and implement a web-based clothing fashion stylerecommendersystembasedondeeplearning;
- A scheme for improving a person’s clothing style by removing thefeatureshe/she doesn’tlike.
- Theseatributesservedtoasimilarmodeltoretrievesimilarimag esasrecommendatons.
- Combined with more common content-based recommendatonsystems, ourmodelcanhelpto extendrobustnessandperformance.

Literaturesurvey

Myntra-MatchingClothesRecommendation:

On selecting a particular item to buy, Myntra automatically suggests a fullsetofclothesthat arematchingtotheselecteditem.Forexample, onselectingaparticular t-shirt, the system automatically generates a combination of watches,shoes, pants, etc. that are matching to the selected t-shirt. This system does nottake into consideration private qualities of customers like skin color and existingclothes.Itwillonlysuggestclothesthatalreadyexistinitsdatabase.

YourCloset:

This is a mobile application that organizes the closet. The user interface isshown in. The application asks customer to input their clothes. It then matcheseach cloth with other clothes. For example, if there are 4 shirts and 4 pants, theapplicationmatcheseachshirtwitheach pantandthusprovides16possibilities.The application does not make matches of clothes depending upon patterns,colorandtextureofclothes.Italso does nothave arecommendationsystem.

YourClosetAppMagicCloset:

This system aims to retrieve clothes from online stores that arematching to the input clothes. These clothes must be ft to a particular occasion.In this system, the user takes a photo of them specifying if they want to use thetoporbottomclothesalongwiththeoccasiontheywantto useitfor.Thesystemwill search for clothing that matches the user query and satisfes the criterion ofwearingaestheticallyandwearing properly.

WhichClothestowearconfdently?:

The basic problem the system addresses is: From the two givenimages corresponding to a pair of clothes, we have to determine if the pair ofclothes matches or not. While there may be several aesthetics espoused bydierent individuals, it takes a simplistic approach in this problem. An example ofshirtsandtiesis used.Variousmachinelearningmethodsareusedtoclassify ifthe clothes are matching or not such as Ridge Regression, Standard NeuralNetworkandSiameseNeuralNetwork.

PersonalizedClothingRecommendationBasedonKnowledgeGraph:

This system attempts to exploit the knowledge graph for providingclothing recommendations to the user keeping the user context in mind. Therecommendation is done by calculating the similarity in the clothing ontologysimilar to users collection. Skin and Clothes matching seeded by Color SystemSelection: The main aim of the system is to suggest clothes to user based onskin color. The paper frst fnds out which color scheme is best suited torepresent skin colors and then tries to fnd a way to recommend if clothes andskincolormatch. An automatedsystemtodeterminethehighest levelsofcolor suitabilitybetweenskinandclothingwasmade.

DiscerningAdvisor:

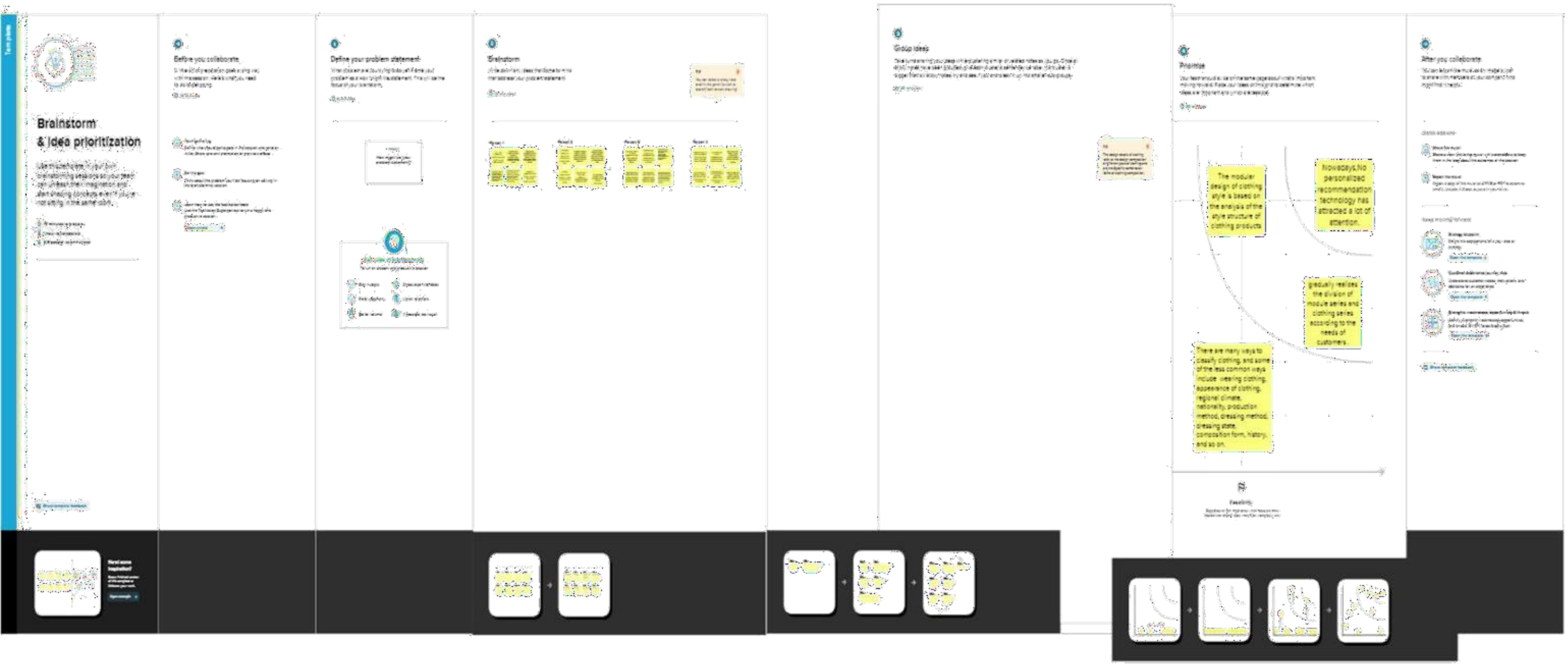
The system tries to recommend clothes based on skin olor of thecustomer. Using a neural network, frst the skin color is detected. Fuzzy logic isusedtomapaskincolortotheskincolor ofafashionmodel,andclothessuitedto that model are recommended. Garment Detectives: The garment detection isto detect the presence of clothes in images and somewhat locate their extents,where the localization can be defned from coarse (image) level to fne (pixel)level. A unifed system is proposed for detecting and recognizing clothes incustomerphotos.

IdentifyingCornersofClothesbyImageProcessing:

This system aims to fnd the edges of the clothes for clothesmanipulation. This system achieves this by fnding pixels that represent theclothes.Thissystemfrstacceptsuserimageandthenperformsseveralimageproc essing operations to improve the efciency of edge detection. It then usescertaincriteriontodecidewhetherapixelrepresentsanimageornot.

Real-timeClothingRecognitionfromSurveillanceVideos:

It is an analysis system of contents of video which is capable of taggingvariousclothesofdifferentpersonsiscreated.First,facedetection andtrackingis performed and each frame is aligned. The system then proceeds to clothingsegmentation using a variant of region growing method. Through this, clothes aredetected. The systemthen proceeds to clothing recognitionand indicates thetypeofclothing –skirt,t-shirt,etc.



Proposedsystemarchitecture

The system architecture defnes the hardware, sofware and networkenvironment of the structure. The system will be web-based meaning that the usersneed to run the URL in order to run the system. The system will run bothhorizontally and vertcally. The architecture used in the system is shown horizontallywhere the Model View Controller is explained as represented in Figure 1. The high-levelpartofthesystemislooked atusingthevertcalway.

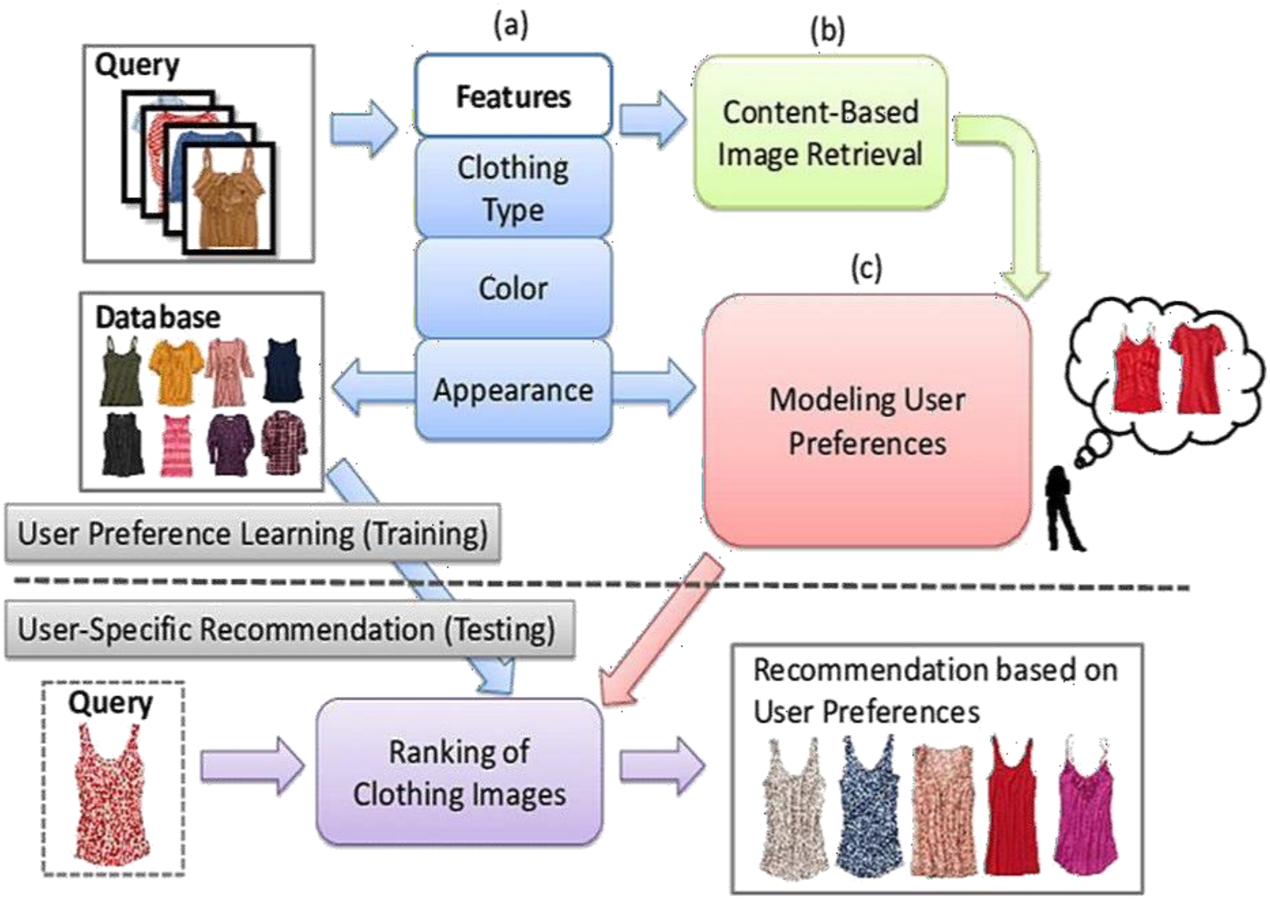


Figure1.**Systemarchitecture**.

The system comprises of the Client tre, which is the front end or View mode, middle terwhich is the system controller and the backend tre which is the model. The client side iswhere the users/customers log in in the system, browse for the system interface, provideinputqueryimagetothesystem,andgetrecommendatonaccordingtotheinput query. Themiddletrueisresponsibleforcommunicatonbetweenthefrontendandthebackend.Itreceives user requests and sends them to the back end and in turn accepts responses fromthe back end and sends them to the user. The internet works to provide access to the sitewithastrongsecuritycheck,providedbybothfrewallandpasswordprotectonpolicy.

Anyunauthorizedaccessisdetectedandpreventedbythefrewall.

a. Theverticalclassifcationsystemmodel

The recommendaton system works with the data set to track user input datafeatures and extracted features from data set upon which new predictons andrecommendatons are made. The recommendaton browses the dataset for userdata and available dataset features. Receives Recommendatons User Web ServerSendsresponsetouserDatabaseStoresUserinput dataStores datasetfeatures.

Data Recommender Makes Recommendatons Recommender AlgorithmDetermines the Similarity between cloths Figure 2. Vertcal architecture of the system.It uses the algorithm to go over the input user data and determine similarites betweenusers input data and stored dataset features. Finally, it makes recommendatons. Bylooking at Figure 1 and Figure 2, we realize that the recommender system does notinteract directly with the users at any point. When the repository stores data, therecommender flters the data it needs from the repository using the algorithm. When asignalis senttothe algorithmaboutwhat dataareneededforfltering,thealgorithm computes the similarity. The similarity results are then transferred to therecommendersystemwhichinturnsendsrecommendatonstothewebserverandf nallytotherespectveuser.

b. Datasetandclassifcation

In this project, we worked with the Deep Fashion dataset, which isgathered from researchers from the Chinese Hong Kong University. It hasoveronemilliondiversetrendpicsandwealthyannotatonswithadditonaldataab out landmarks, categories, pairs etc. The dataset consists of 5 distnct typesof predictngsubsetsthataretailor-madetowardstheirtasks.

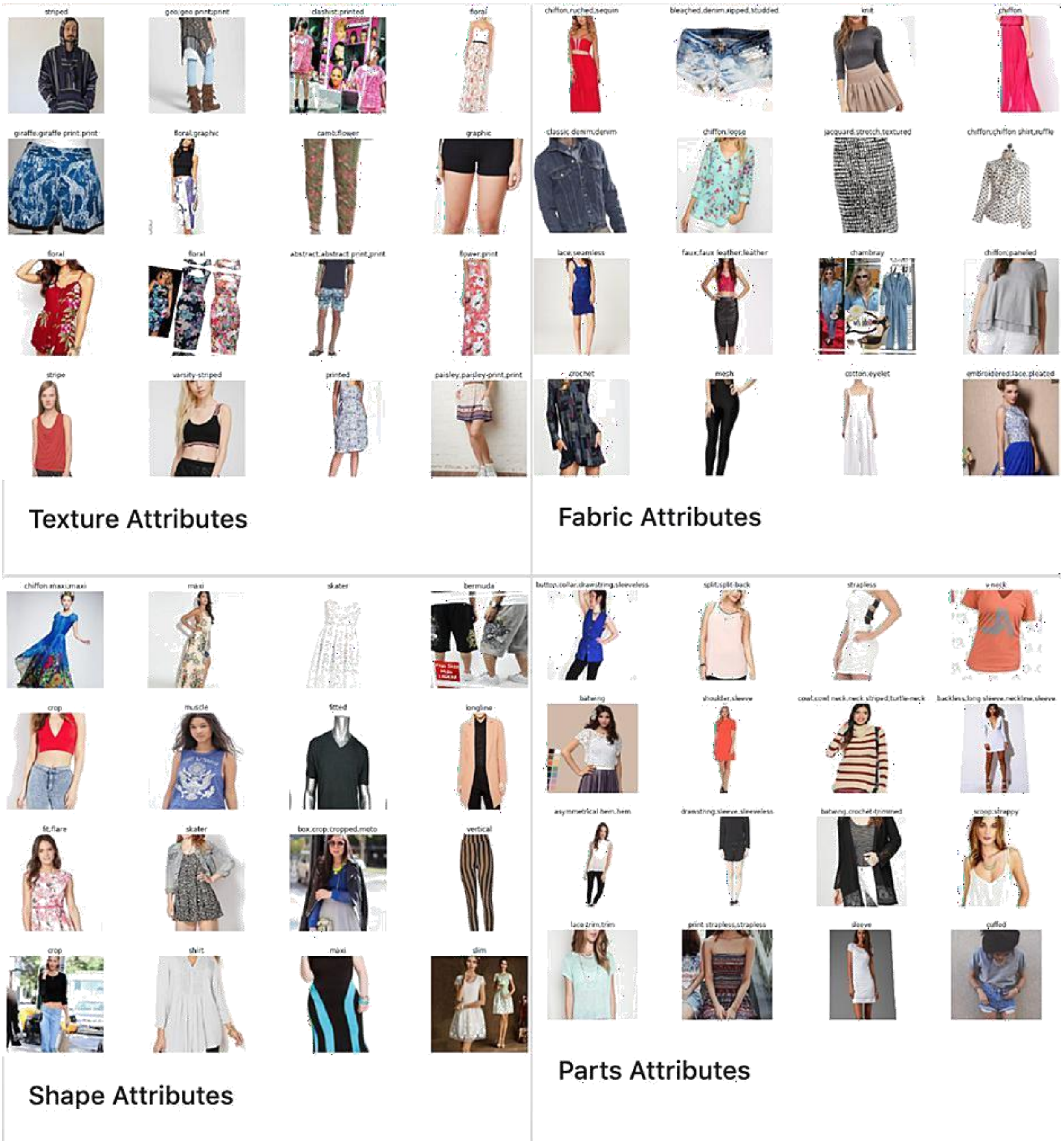
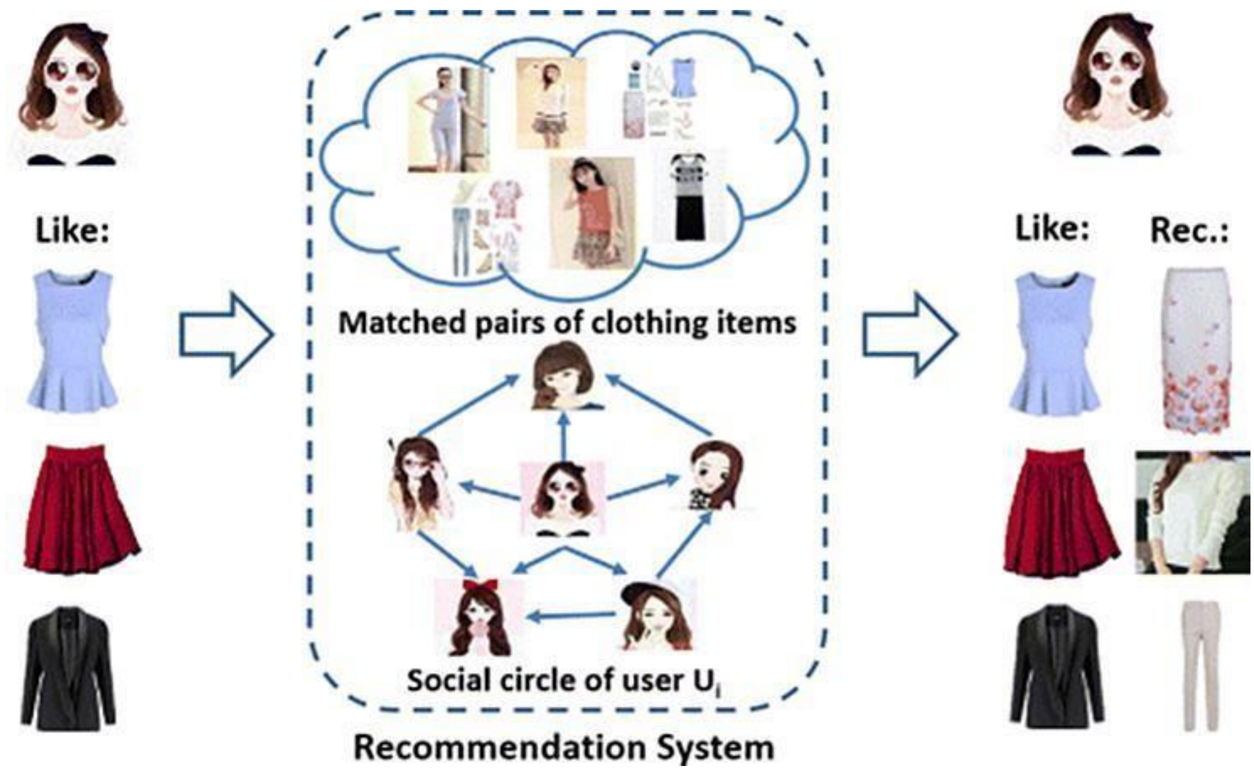


Figure 3. Fashion dataset One subset, known as Atribute Predicton, can beusedforapparelcategoryandatributepredicton.Fromalmost290,000photos of50 apparel categories and 1,000 apparel atributes, we randomly picked 18kimages from diferent categories and then we classifed them for training andtestng.Thedistributon oflabelsispresentedinFigure

c. Designofdeeplearningmodule

There are many classifcaton algorithms or classifers in use today. The mostnotablyandthemostimplementedclassifersandfeatureextractorareimplementedt o solve a problem of cloth / fashion recommendaton Design process. (1)are weightvectors, are fully connected output layers that actually perform classifcaton and aretheCNNwithoutthelastlayer.Theyareusedasafeatureextractors.



The core network of our model as shown in Figure 4. who presented aconvolutonal neural network in the paper “Very Deep Convolutonal NetworksforLarge-ScaleImageRecogniton”,attheUniversityofOxford.”.Thenmodelischeckedfortop-5accuracyonImageNet.

Results and Evaluation

This secton focuses on evaluatng our system and deciding the stage whichitisable tofulflthe purposeforwhichitwascreatedtheperformance ofthe systemis analysed in detail through several tests, from small scale to large scale. Firstly,the unit tests are done at the lower stages and then we proceed to the whole testsystem. In the training implementaton module, we are performing the movementthroughout the area, freeze the base layers of the organizaton i.e., the VGG16layers, and train the model on the dataset for 5 epochs. This trains the externallayers to fgure out how to characterize the pictures. We then unfreeze the lowerlayers and train the model for 5-7 epochs untl the approval exactness setles. Wekeep the best achievable loads (best on approval exactness) and use it for thesuggestonmodel.Thetrainingimplementatoncodeispresentedbelow.

Step1:Trainingthe wholenetworkfor5 epochsfrst
Step2:Checkpoint_callback=modelcheckpoint(‘,/model/vgg_weights_best_patern.hdf5’.**St ep.3**: Monitor=’val_acc’, verbose=0 save_best_only=true,save_weights_only=false,mode=auto’,period=1)
Step4:Tf_model.ft_generator(Train_generator,Samples_per_epoch=nb_train_sample,N b_epoch=10, Validaton data=validaton_generator,Nb_val_samples=nb_validaton_samples, Verbose=1, Inital_epoch=5,Callbacks=[checkpoint_callback]
Step 5: end

1.Visualrecommendationmoduleimplementation

To get proposals, we wished to construct a vault of pictures. This archivewould be a unique applicaton. If the suggeston was cultvated for shopping, the storehousewould have contained pictures from online retail locatons like Amazon, eBay, Pinterest,Instagram, etc. A subset of patern datasets was used to test our proposed approach. Atthat point, the informaton had already been cleared of unimportant photos. Then, thephotos were passed by means of the organizaton and design vector pictures have beencreated from eachphoto.Forthe getngthesuggeston,wefrstneededtobuildthe individual style profle. This is brought out by taking one or more noteworthy picturesoftheclient'sidealatre thingsasthey wereenteredandby making theirstylevector. These vectors are then blended to shape the framework of the individualstyleprofle.TheFigure5shownPaternrecommendatonwithsimilarityscore.

Figure5.Paternrecommendatonwithsimilarityscore

The proposed scheme is further below, as follows: we will utlize a closenesscalculaton, which and the designvector of each picture in the vault with the style proflegrid.Thisgivesusascoredependent onthequanttyofcomponentcoordinates(i.e.,how greatisthedegreeofsimilarity ofapicturetotheindividual'sstyleprofle).

Step1:defsimilarity(feature_data,inp_feature_data):

Step2:nun_samp=inp_feature_data.size

Step3:print(unm_samp)Sim_score=[]foriinrange(1 en(feature_data)):score=0

Step4:show_sample(data_images[i])

Step5:print(feature_data[i])score_m=inp_feature_data-feature_data[i]

Step 6: print (Soore_ m) score= nun_samp-np. Count_nonzero (score_m)sim_score[i]=score

Step7:print(score)simScore

Step 8: end

i.Usermanagementservices:

Thesystemprovidesaplatormthroughwhichausercanvisitthesystemandprovidehis/herchoicesregardingthefashionimagesforbestrecommendaton.

ii. Fashionvectorforimagesinrepositoryandinputfashionvector:

The system is responsible for making fashion vectors for images intherepositoryandfashionvectorimagesprovidedbytheusertothesystem, for the similarity measures and for making recommendatons. Afermaking the fashion vector, some predictons are made, as illustrated Thesystem is responsible for making recommendatons to users based on theiruserdata.Theuserdatacompiledinthedatasetisflteredbytherecommender systemthroughtherecommenderalgorithm.

Step1: Def similarity (feature_data, inp_feature_data);
Num_samp=inp_feature_data.size**Step2:**print(num_samp)Sim_score=()Foriinrange(len(feature_data));score=0show_sample(data_images[i])print(feature_data[i])RomanianJournalofInformatonTechnology and Automatc Control, Vol. 31, No. 4, 123-136, 2021
131http://www.rria.ici.ro**Step3:**Score_minp_feature_data-feature_data[i]print(score_m)

Step4:Score=num_samp-np.count_nonzero(score_m)Sim_score[i]=scoreprint(score)

Step5:Returnsim_score

Step1:Similarites=similarity(feature_data,inp_feature_data)

step.2.items(),

key=operator.itemegter(1),
reverse=(true)
Num_reco=30
data=feature_data.size
For I in
range(num_reco)Ind=sorte
d_similarites[i][0]
print(sorted_similarites)

Print (“score:”,
sorted_similartes[i][1])Show_sample(
data_images[ind])

Step3:end

By accessing the system, users are able to access and view their content-based recommendatons. However, all the recommendatons are made based on thesimilaritybetweenuserinputsanduserinputs.Aslongasthereisalevelofsimilarity,wem akethe bestrecommendatons.

iv. Recommendertothequeryimages indataset:

We can see that our model can capture thebest matching style by including the length,shape, colour, fabric and patern of the cloths, as illustrated in three query images examples. Inthefrstexample,themodelcapturesdeepfeaturesincludingtheblousecategory,fabric,repeated foral patern and the regular ft style. As seen, the fve recommended images displaydiferentclothes. The second exampleshowsthat the model captures the wool fabrics,thecontrast colour sttches and the turtleneck. The third example shows that the model can capturethecotonfabricsandtheprintedleters.Therecommendatonscanbeseen inFigure.

DESCRIBING CLOTHES AND STYLE

CLASSY

Your style is elegant and, with clean, simple lines, softly tailored not usually mix and match. Never trendy, faddish or severe. Textures such as silk, soft woolen fabrics, cotton are among your favourites.

FUNKY ROCK

This look is edgy, a fashion style expressed by bold hair styles and colors, accessories, black leather jackets and shirts with funky designs.

ETNIC

The easiest way to wear the look is a print. If prints aren't your thing, then you can still indulge in the ethnic /tribal fashion trend by way of accessories.

GIRLY GLAM

Your outfits hug Your body tightly and are full of pink, loud and sparkly accessories, high stilettos and platforms. It is a style that exposes some of your body and brings out a flirty, feminine and sexy look.

BOHO CHIC

It a vintage inspired style with earthy tones, loose fitting clothes, and combining certain looks to appeal to an eclectic vibe. This trend is a mix of luxurious textures and contrasting fabrics, big purses, casual, long necklaces...

TRENDY

You love the big city and adore your uniform of all black with stiletto boots, pumps, or sandals. You love to dress up, be in all the latest trends. You know which pieces make the whole look appear expensive.

PREPPY/GIRLY

Polo shirts, or Oxford shirts, dresses and T shirts all either in pastel or bright colors. jeans, khakis, slacks, or Bermuda shorts. Oxford shoes, tennis shoes, ballet flats make the look.

CASUAL

A cute, sweat suit is your go-to outfit .If an evening activity is on the agenda, a quick change to slacks or jeans and a sweater or nice T-shirt does the trick. Your color navy, gray, and black

PUNK

A lot of punk clothing has a DIY (do it yourself) look to it. Flight jackets, skinny jeans, leather, studs, are the things to wear together with classic accessories like, arm warmers, bullet belts, and wristbands with pyramid studs, stars or spikes.

MOD

Dresses and skirts are A-line and either mid-thigh length or just below the knee. Go for crazy patterns or stripes with lines that pop. Typical colors are white and black, but you can incorporate others. Mod shoes are chunky knee- or ankle-high boots

SKATER

Their look is more put together and creative then you'd think. Strategic layers (long and short sleeve Tees) and smart yet accessories (necklaces, etc.) are the basis of this look.

HIPSTER

Wear skinny jeans, basically, the tighter, the better. Wear glasses and dress vintage. Hipster shoes include cowboy boots, Converse, and a range of flats. Wearing things that don't match together is also very hipster.

HOBO

Hobo's clothes must be either painfully small or comically large. Hobo Shoes can cover a wide range of styles, as long as they are beaten up and battered, fingerless gloves and hats give you the look too.

GOTH GLAM

Goth glam fashion is now a classy version of gothic. It still retains dark and gloomy colors like black, navy and burgundy.

ROMANTIC

You like to wear soft colors and fabrics like chiffon and silk that drape graciously on your body. You also go for ruffle or skirt and dresses with floral prints, lace, crocheted tops, cameos and antique jewelry.

EMO

Tight clothing is still your thing, though much of it has taken a more modern look now. Stripes are popular as stars, hearts, skulls, nautical stars, and sparrows. Hair still black.

As shown in Figure, our model can capture the style withhighaccuracy,meaningthatoursystemachievesitspurpose.Itcanbenotced that our system can perform for all the involved categories like patern,style, fabric etc. The highest similarity score shows that the input images andthe recommended ones are similar. This fgure also illustrates that the systemcan work best for patern recommendaton and recommend top similar imagesin diferentcolours,shapes,andstyles.

v.Recommendationstothequeryimagesoutsidethedataset:

It’s natural to ask if the model you made works with images which are not partofthedataset.Werandomlydownloadedthreeonlineimagesillustratngexpensi ve clothes. As shown in Figure 8, the model is stll able to capture thestyle, paternandfabricsoftheclothesandrecommendsimilarones.

The model is checked for diferent categories like patern, style, fabric.The highest score show that the image is more similar to the input query. So,ourmodelobtainshighsimilarityscorefor diferentcategories.

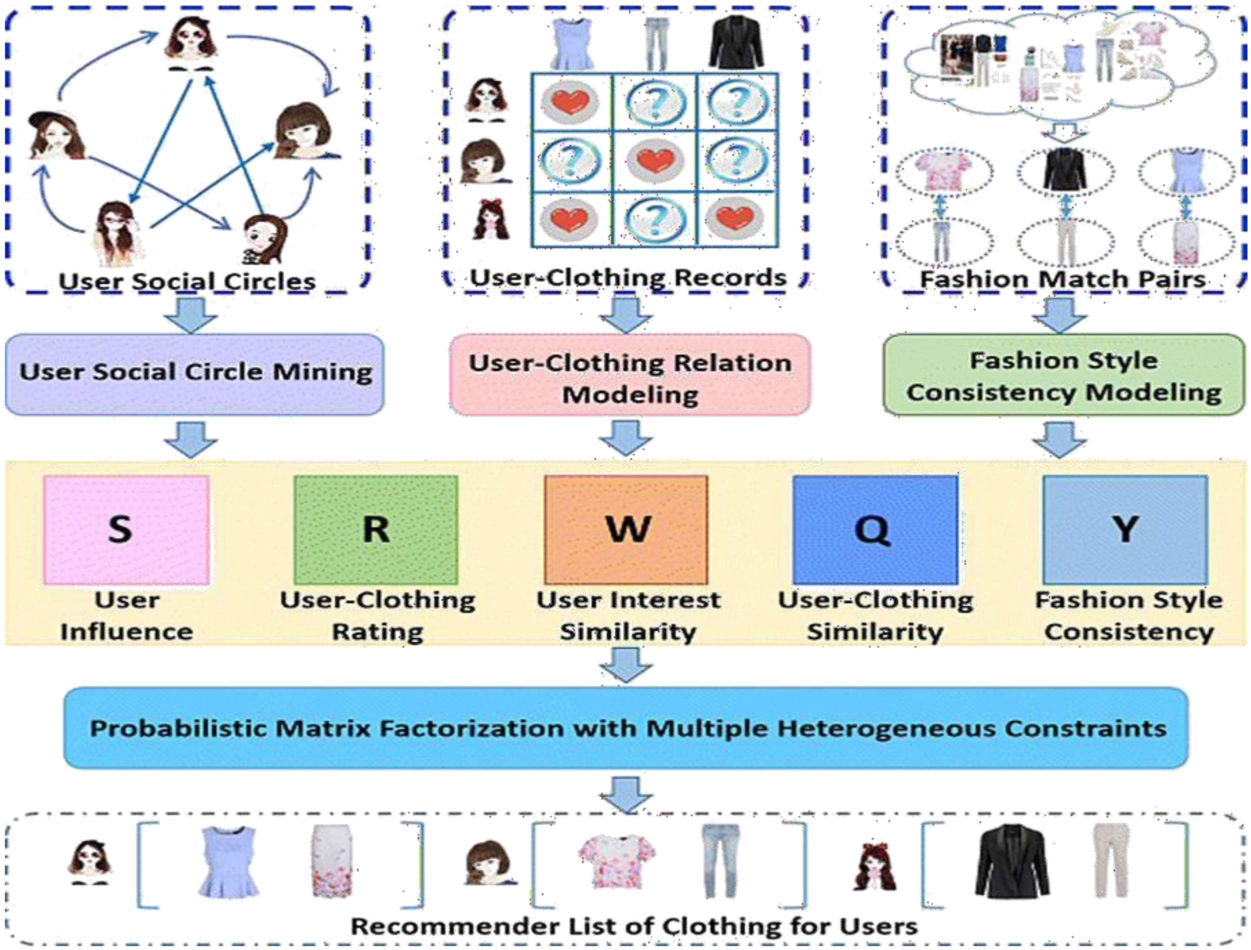


Figure:Outsiderecommendatondataset

Systemresultandaccuracy:

Finally, this subsecton evaluates the system and shows the testng resultsand the accuracy of our model. Afer adding the model on top of the convolutonal base,freezing the weights of all layers except of the top ones, and training the model for 5epochs,thefollowing accuracywasobtained,asshowninFigure.

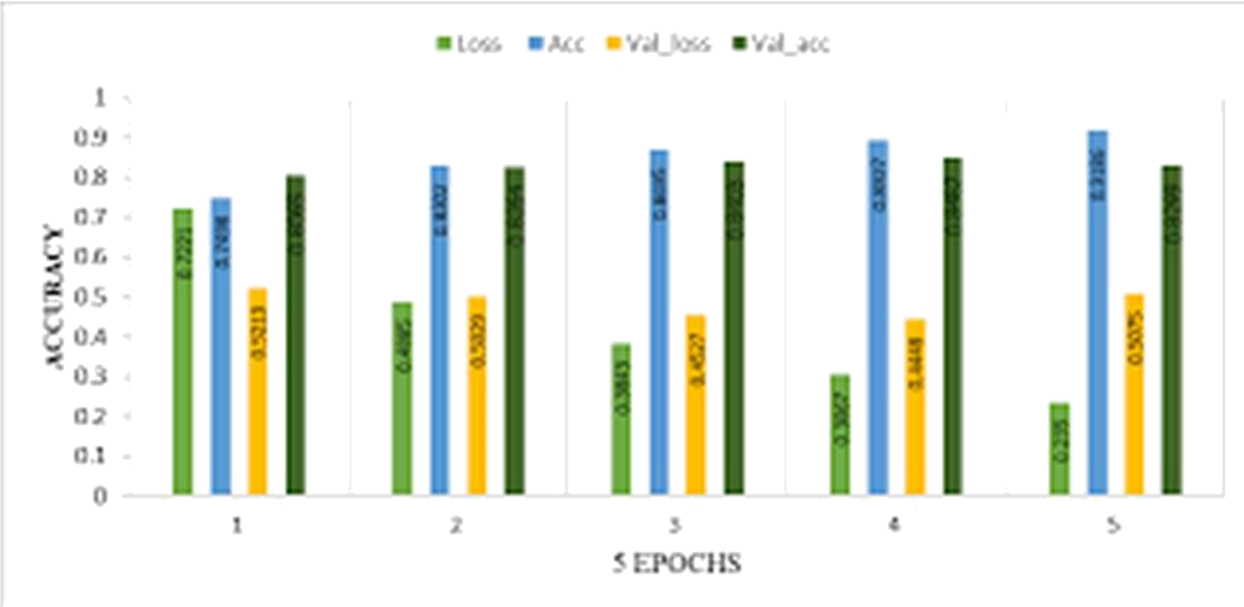


Figure9.Modelaccuracyaferfreezingthelayers for5epochs

Afercalculatngthemeanaccuracyfor5 epochs,theobtainedresultsareasfollows:

Validaton:accuracy=0.836000;loss=0.489109

This part of the sentence “Afer calculatng the mean accuracy for 5 epochs” ismentonedalsobelow,aferFigure 10,andthese valuesmentonedforaccuracy and loss (0.836000 and0.489109)arenotillustratedinFigure9, butinFigure.

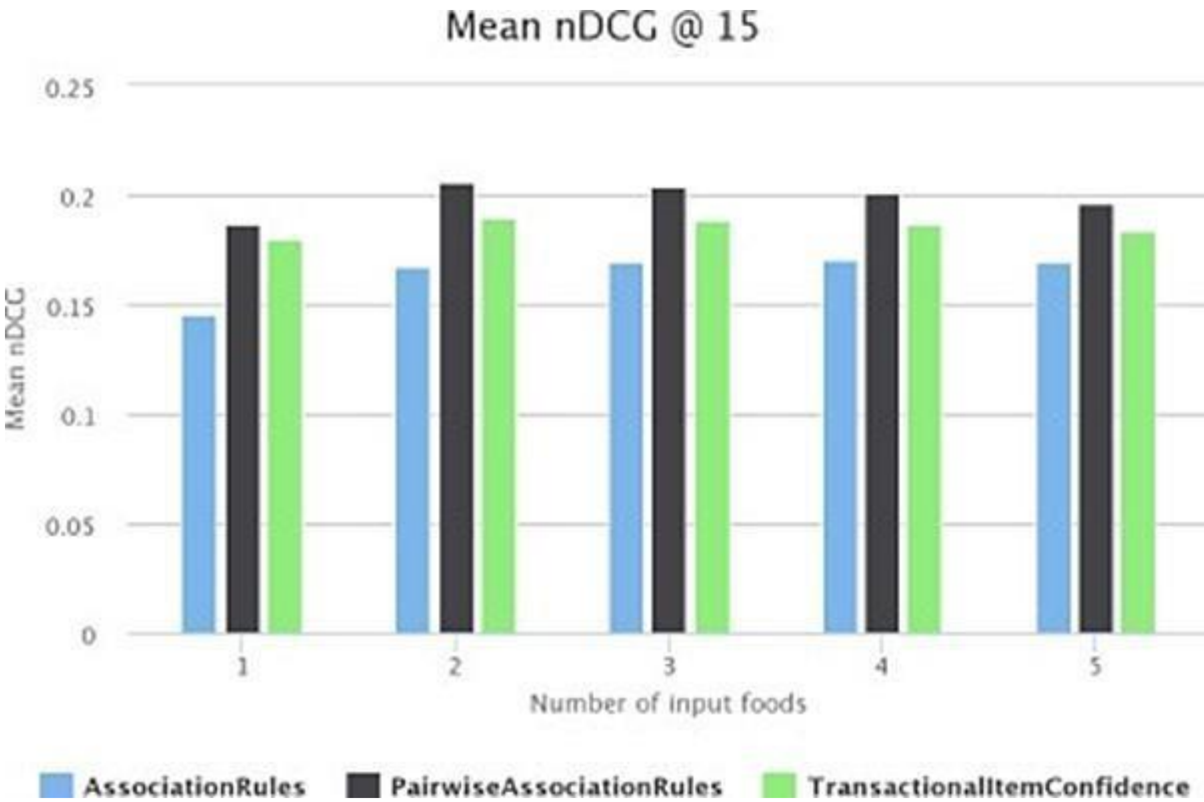


Figure10.Modelaccuracyfor5epochs

Afer calculatng the mean accuracy for 5 epochs, the fnal result are as follows:Validaton:accuracy=0.864750;loss=0.516400Thesevaluesmentonedforaccuracyand loss(0.864750and0.516400)arenotillustratedinFigure10.

The accuracy of our model was compared with the one of Alex Net model. It canbe clearly notced that our model gives a beter accuracy when compared toAlexNet,asshowninFigure11.

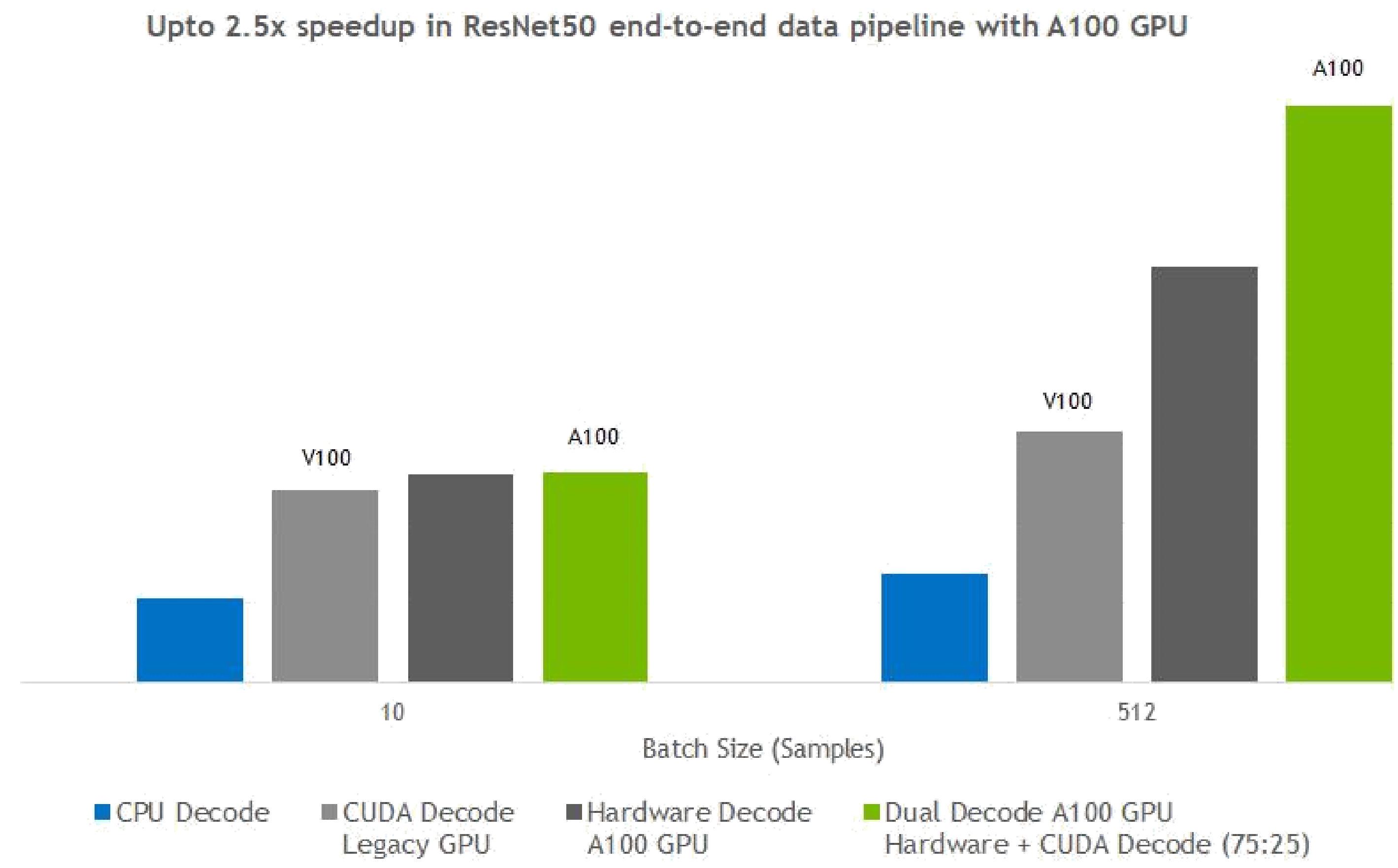


Figure11.Accuracyandloss

Recommender systems are stll developing and, as extra research is beingdone, extra areas and weaknesses that need greater study are also developing.Recommender systems have proved to be a great soluton to the overload of webdata, an important problem afectng the users. With the ever-growing records andchoices, recommender systems enable the customers to access the data they needwithin minutes, just by a mere mouse click or by a single key stroke. Table 2 showsthecomparisonwithothermodelsregardingthe accuracyand thelossvalues.

Source Code

fashion.html

```
<html>
   <head>
      <metaname="viewpoint"content="width=device-width,inital-scale=1.0">
      <ttle>FASHIONVIBE</ttle>
      <style>
       *{margi
   n:0;
   padding:0;
     font-family:"Century Gothic", CenturyGothic, AppleGothic, sans-
    serif,'CourierNew',Courier,monospace;
   box-sizing: border-
   box;background:fxed;

}

.footer
{
   width:100%;
   height:
   20%;display
   :fex;
   background:#121212;
   margin-top:5%;color:
   #7DE5ED;padding-
   lef:22%;
```

```
    align-items:
    center;text-
    align:center;

}
.hero{
    width:
    100%;height
    :auto;
    background-
    color:#8f8f8f;color:
    #525252;

}
nav{
    background:
    #7DE5ED;width:100%;
    padding:10px10%;
    display:fex;
    align-items:center;
    justfy-content:space-between;
    positon:fxed;

}
.logo{
```

width:200px;

```
    height:50px;
    text-
    decoraton:none;text-
    align:
    center;color:#00112
    8;
}
.user-
    pic{width:40
    px;
    border-radius:
    50%;cursor:
    pointer;margin-
    lef:30px;
}
navul{
    width:
    100%;text-align:
    right;font-
    weight:bold;
}
navulli{
    display: inline-
    block;list-style:
    none;margin:10px
    20px;
```

```
}
navullia{
    color:rgb(252,252,5);
    text-decoraton:none;
```

```
}
.Banner
{
    foat:lef;width
    :100%;
    height:400px;
    background-color:#121212;
    color:
    #7DE5ED;margi
    n-top:   10%;text-
    align:center;
}
.Bannerimg1
{
    foat:
    lef;width:50%;
    height:400px;
    background-color:#525252;
}
.Bannerimg2
{
    foat:
    right;width:50
    %;height:400
    px;
    background-color:#525252;
```

```
}
.Adcontent
{
   width:45%;heig
   ht:
   400px;margin-
   lef: 55%;color:
   #7DE5ED;text-
   align:center;pad
   ding:100px;
}
.Adcontent2
{
   width:45%;heig
   ht:
   400px;margin-
   lef: 5%;
   color:
   #7DE5ED;text-
   align:
   center;padding:
   100px;
}

.columnst
   {foat:lef;margi
```

n-lef:7%;

margin-top:10%;

```
width:230px;
height:400px;
background-color:transparent;
border: 2px solid
#74bde0;border-
color:transparent;

}
.column
{foat:lef;margi
n-lef:7%;
margin-top:
10%;width:230px
;height:400px;
background-
color:transparent;border: 2px
solid #74bde0;border-
color:transparent;
}
.columnend
{
foat:lef;margin
-lef:7%;
margin-top:10%;
margin-botom:
10%;width:230px;
```

```
    height:400px;
    background-
    color:transparent;border: 2px
    solid #74bde0;border-
    color:transparent;

}
.Botom
{
    height:50px;
    width:230px;
    text-align:
    center;margin-
    top:300;
    background:
    #000000e8;color:rgb(25
    2,252,5);padding:5%;
}
.depimg
{
    foat:lef;width:
    228px;height:
    300px;
    background-
    color:transparent;border: 2px
    solid #74bde0;border-
```

color:transparent;

```
}
.image
{
   width:100%;
   height:
   100%;object-
   ft:contain;
}
.search{
   width:
   330px;margin-
   lef: 40%;color:
   #7DE5ED;posito
   n:fxed;
}

.srch{
   width:
   200px;height
   :40px;
   background:#7DE5ED;
   border:2pxsolid#121212;
   margin-top:
   13px;margin-right:13px;
   color:#FCE700;
```

font-size:16px;

```
    align-items:
    center;padding:10
    px;
    border-botom-lef-radius:25px;
    border-top-lef-radius:
    25px;border-botom-right-
    radius:25px;border-top-right-
    radius:25px;

}

.btn{
    width:
    60px;height:
    40px;
    border: 2px solid
    #000000dd;background:#00
    0000dd;margin-top:13px;
    color: rgb(252, 252,
    5);align-items:
    center;font-size: 15px;
    border-botom-lef-radius:
    25px;border-top-lef-radius:
    25px;border-botom-right-radius:
    25px;border-top-right-
    radius:25px;
```

```
}
```

```
.btn:focus{outlin
   e:none;
}

.srch:focus{outli
   ne:none;
}
.sub-menu-
   wrap{positon:ab
   solute;top:100%;
   right:
   2%;width:32
   0px;
   max-
   height:0px;overfow:hidde
   n;transiton:max-
   height0.5s;


}
.sub-menu-wrap.open-menu{
   max-height:400px;
}
.sub-
   menu{background:rgb(252,
   252,5);padding:20px;
   margin:10px;
```

```
    border-radius: 8%;

}
.user-
    info{display
    :fex;
    align-items:center;
}
.user-info h3{
    font-weight:500;
}
.user-info
    img{width:6
    0px;
    border-radius:
    50%;margin-
    right:15px;
}
.sub-menu
    hr{border:
    0;height:
    1px;width:10
    0%;
    background:#525252;
    margin:15px010px;
}
```

.sub-menu-link{

```
   display:fex;
   align-items:
   center;text-
   decoraton:
   none;color:
   #525252;margin:12p
   x0;
}
.sub-menu-linkp{
   width:100%;
}
.sub-menu-link
   img{width:
   40px;background:
   #e5e5e5;border-
   radius:
   50%;padding:8px;
   margin-right:15px;
}
.sub-menu-link
   span{font-size:
   22px;
   transiton:transform0.5s;
}
.sub-menu-link:hoverspan{
   transform:translateX(5px);
```

```
}
.sub-menu-link:hoverp{
```

```
   font-weight:600;
}
.hello{
   margin-botom:
   200px;text-align:
   lef;positon:absolute;ri
   ght: 10px;

}

      </style>
   </head>

   <body>

         <nav>
            <aclass="logo"href="MadFinalhome.html"><h2>FASHION
            VIBE</h2></a><ul>
               <li><inputclass="srch"type="search"name=""placeholder="TYPETOSEARCH">
              <ahref="#"><butonclass="btn">SEARCH</buton></a></li>
              <li><ahref="#">HOME</a></li><li><ah
              ref="#">FEATURES</a></li>
              <li><ahref="#">ABOUT</a></li>
```

```
</ul>
<imgsrc="https://storagedemo-madzh.s3.jp-tok.cloud-object-storage.appdomain.cloud/images/profle.jpeg" class="user-pic"onclick="toggleMenu()">

<divclass="sub-menu-wrap"id="subMenu">
 <divclass="sub-menu">
  <divclass="user-info">
   <img src="https://storagedemo-madzh.s3.jp-tok.cloud-object-storage.appdomain.cloud/images/profle.jpeg">
   <h2>NAME</h2>
  </div>
  <hr>

  <ahref="#"class="sub-menu-link">
   <img src="https://storagedemo-madzh.s3.jp-tok.cloud-object-storage.appdomain.cloud/images/profle.jpeg">
   <p>EDITPROFILE</p>

  </a>

  <ahref="#"class="sub-menu-link">
   <img src="https://storagedemo-madzh.s3.jp-tok.cloud-object-storage.appdomain.cloud/images/setngs.jpeg">
```

```
<p>SETTING&PRIVACY</p>

</a>

<ahref="#"class="sub-menu-link">
<img src="https://storagedemo-madzh.s3.jp-tok.cloud-
object-storage.appdomain.cloud/images/help.jpeg">
<p>HELP</p>

</a>

<ahref="/Login"class="sub-menu-link">
<img src="https://cdn-icons-
png.fatcon.com/512/56/56805.png"><p>LOGOUT</p>

</a>
</div>
</div>

</nav>

<divclass="Banner">
<divclass="Bannerimg1"><imgimgclass="image"
src="fashionimagebanner.webp"></div>
```

```
<divclass="Adcontent">
<h1><br>THEJOYOFDRESSINGISANART.</br></h1>
<br>Let'shave alook on it ------- ></br>
</div>
</div>

<divclass="rowstart">
<divclass="columnst"><divclass="depimg"><imgclass="image"sr
c="sarees.webp"></div><divclass="Botom">WEDDINGSAREES</div></div>

<divclass="columnst"><divclass="depimg"><imgclass="image"src="Salwarka
meez.webp"></div><divclass="Botom">SALWARKAMEEZ</div></div>

<divclass="columnst"><divclass="depimg"><imgclass="image"sr
c="Kurts.webp"></div><divclass="Botom">CASUALKURTIS</div></div>

<divclass="columnst"><divclass="depimg"><imgclass="image"src="bridalleh
enga.webp"> </div><div class="Botom">BRIDAL LEHENGA</div></div>
</div>

<divclass="Banner">
<divclass="Bannerimg2"><imgimgclass="image"
src="lovablekidsatre.webp"></div>
<divclass="Adcontent2">
<h1class="kids"><br>LOVABLEKIDSATTIRE</br></h1>
```

```
        <br>-------Smilesare alwaysinFASHION ---------</br>
      </div>
    </div>

    <divclass="row">

            <div class="column"> <div class="depimg"><img
class="image"src="Modernvibe.webp"></div><divclass="Botom">MODERNVIBE<
/div></div>

                        <div class="column"> <div class="depimg"><img
class="image"src="festvemood.webp"></div><divclass="Botom">FESTIVEMOOD
</div></div>

              <div class="column"> <div class="depimg"><img
class="image"src="skinnydress.webp"></div><divclass="Botom">SKINNYDRESS<
/div></div>

               <div class="column"> <div class="depimg"><img
class="image"src="Maxgirls.webp"></div><divclass="Botom">MAXGIRLS</
div></div>
    </div>

    <divclass="Banner">
                                   <divclass="Bannerimg1"><imgimgclass="image"
src="mensfashion.webp"></div>
      <divclass="Adcontent">
        <h1><br>HANDSOMEMENATTIRE</br></h1>
        <br>AlwaysDRESSwell,KeepitSIMPLEbutSIGNIFICANT ..........</br>
```

```
    </div>
  </div>

  <divclass="row">
        <divclass="column"><divclass="depimg"><imgclass="image"src="polotshir
ts.webp"></div><divclass="Botom">POLOT-SHIRTS</div></div>

                <div class="column"> <div class="depimg"><img
class="image"src="menhoodies.webp"></div><divclass="Botom">HOODIES</di
v></div>

         <divclass="column"><divclass="depimg"><imgclass="image"src="menca
suals.webp"> </div><divclass="Botom">MENCASUALS</div></div>

        <divclass="column"><divclass="depimg"><imgclass="image"src="formalshi
rts.webp"></div> <divclass="Botom">FORMAL SHIRTS</div></div>
  </div>

  <divclass="Banner">
    <divclass="Bannerimg2"><imgclass="image"src="adornments.webp"></div>
    <divclass="Adcontent2">
      <h1><br>PERSONALADORNMENTS</br></h1>
      <br>ADORNMENTis neveranything exceptaREFLECTIONoftheHEART!!!</br>
    </div>
  </div>
```

```
<divclass="rowend">
<divclass="columnend"><divclass="depimg"><imgclass="image"src="womenor
nmanets.webp"></div><divclass="Botom">JEWELLERY</div></div>

<div class="columnend"> <div class="depimg"><img
class="image"src="watch.jpg"></div><divclass="Botom">WATCHES</di
v></div>

<div class="columnend"> <div
class="depimg"><imgclass="image"
src="https://5.imimg.com/data5/TQ/NK/MY-45888708/men-belts-
500x500.jpg"></div><divclass="Botom">BELTS</div></div>

<div class="columnend"> <div class="depimg"><img
class="image"src="https://encrypted-
tbn0.gstatc.com/images?q=tbn:ANd9GcQSWDKgpQeZ-3VNR7-
9SfaVGVvqOawrkZiLdNfSpjNNQJNI6hl8cJg0Qs_DZfpJtzUst0&usqp=CAU"></div>
<divclass="Botom">HANDBAGS&CLUTCHES</div></div>

</div>

<script>
letsubMenu=document.getElementById("subMenu");fu
nctontoggleMenu(){
subMenu.classList.toggle("open-menu");
}
window.watsonAssistantChatOptons={
integratonID:"1a8c11c0-839e-4442-8b03-59f7c12ce5f5",//TheIDofthis
```

```
integraton.
    region: "au-syd", // The region your integraton is hosted
     in.serviceInstanceID:"bada3725-51e6-42fe-bccc-3e2603433478",//TheID
ofyourserviceinstance.
    onLoad:functon(instance){instance.render();}
  };
  setTimeout(functon(){
    constt=document.createElement('script');
        t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/"
+(window.watsonAssistantChatOptons.clientVersion || 'latest')
+"/WatsonAssistantChatEntry.js";
    document.head.appendChild(t);
  });
</script>
</body>
<footer>
  <divclass="footer">
    <divclass="hello">
      <ahref="Feedback.html">feedback</a>
    </div>
    <div>
      <H1>THANKYOUFORPURCHASING. ....... WELCOMEAGAIN!!!!</H1>
    </div>
  </div>
</footer>
```

</html>

server.py

```
from fask import Flask,
render_template,request importos



appFlask=Flask(___name__)
picFolder =
os.path.join('statc','images')appFlask.confg['UPL
OAD_FOLDER']=picFolder



@appFlask.route('/')@
appFlask.route('/out')d
ef index():
   returnrender_template("login.html")


@appFlask.route('/login',methods=['POST','GET'])
defmy_forum_post():
   returnrender_template('FashionVibe.html')


@appFlask.route('/index',methods=['POST','GET'])
```

```
defmy_forum_posts():
    returnrender_template('index.html')


@appFlask.route('/Feed',methods=['POST','GET'])d
efmy_forum_posts1():
    returnrender_template('Feedback.html')



 if__name__== "__main__":
 appFlask.run(debug=True)
```

fashion.css

```
{
    margin:0;
    padding:0;
      font-family:"Century Gothic", CenturyGothic, AppleGothic, sans-
     serif,'CourierNew',Courier,monospace;
    box-sizing: border-
    box;background:fxed;


}


.footer
{
```

```
    width:100%;
    height:
    20%;display
    :fex;
    background:#121212;
    margin-top:5%;color:
    #7DE5ED;padding-
    lef: 22%;align-items:
    center;text-
    align:center;


}
.hero{
    width:
    100%;height
    :auto;
    background-color:#8f8f8f;
    color:#525252;


}
nav{
    background:
    #7DE5ED;width:100%;
    padding: 10px
    10%;display:fex;
```

```
    align-items:center;
    justfy-content:space-between;
    positon:fxed;


}
.logo{


    width:200px;
    height:50px;
    text-
    decoraton:none;text-
    align:
    center;color:#00112
    8;
}
.user-
    pic{width:40
    px;
    border-radius:
    50%;cursor:
    pointer;margin-
    lef:30px;
}
navul{
    width:
    100%;text-align:
```

right;font-

weight:bold;

```
}
navulli{
   display: inline-
   block;list-style:
   none;margin:10px
   20px;
}
navullia{
   color: rgb(252, 252,
   5);text-
   decoraton:none;
}
.Banner
{
   foat:lef;width
   :100%;
   height:400px;
   background-color:#121212;
   color:
   #7DE5ED;margi
   n-top:   10%;text-
   align:center;
}
.Bannerimg1
{
   foat:
```

lef;width:5

0%;

```
    height:400px;
    background-color:#525252;
}
.Bannerimg2
{
    foat:
    right;width:50
    %;height:400
    px;
    background-color:#525252;
}
.Adcontent
{
    width:45%;height
    : 400px;margin-
    lef: 55%;color:
    #7DE5ED;text-
    align:
    center;padding:1
    00px;
}
.Adcontent2
{
    width:45%;hei
    ght:
    400px;margin-
```

lef:5%;

```
    color:
    #7DE5ED;text-
    align:
    center;padding:1
    00px;
}

.columnst
    {foat:lef;margi
    n-lef:7%;
    margin-top:10%;
    width:230px;
    height:400px;
    background-color:transparent;
    border: 2px solid
    #74bde0;border-
    color:transparent;


}
.column
    {foat:lef;margi
    n-lef:7%;
    margin-top:
    10%;width:230px
    ;height:400px;
    background-color:transparent;
```

```
    border: 2px solid
    #74bde0;border-
    color:transparent;
}
.columnend
{
    foat:lef;margin
    -lef:7%;
    margin-top:10%;
    margin-botom:
    10%;width:230px;he
    ight:400px;
    background-color:transparent;
    border: 2px solid
    #74bde0;border-
    color:transparent;

}
.Botom
{
    height:50px;
    width:230px;
    text-align:
    center;margin-
    top:300;
    background:#000000e8;
```

color:rgb(252,252,5);

```
  padding:5%;
}
.depimg
{
  foat:lef;width:
  228px;height:
  300px;
  background-
  color:transparent;border: 2px
  solid #74bde0;border-
  color:transparent;

}
.image
{
  width:100%;
  height:
  100%;object-
  ft:contain;
}
.search{
  width:
  330px;margin-
  lef: 40%;color:
  #7DE5ED;posito
  n:fxed;
```

```
}
```

```
.srch{
  width:
  200px;height
  :40px;
  background:
  #7DE5ED;border: 2px
  solid #121212;margin-
  top:13px;
  margin-right:13px
  ;color:
  #FCE700;font-
  size: 16px;align-
  items:
  center;padding:10
  px;
  border-botom-lef-radius:
  25px;border-top-lef-radius:
  25px;border-botom-right-radius:
  25px;border-top-right-
  radius:25px;


}


.btn{
  width:
```

60px;height:

40px;

border:2pxsolid#000000dd;

```
    background:#000000dd;
    margin-top:13px;
    color:rgb(252, 252,5);
    align-items:
    center;font-size:
    15px;
    border-botom-lef-radius:25px;
    border-top-lef-radius:
    25px;border-botom-right-
    radius:25px;border-top-right-
    radius:25px;
}

.btn:focus{outlin
    e:none;
}

.srch:focus{outli
    ne:none;
}
.sub-menu-
    wrap{positon:ab
    solute;top:100%;
    right:
    2%;width:32
    0px;
```

```
max-
height:0px;overfow:hidde
n;transiton:max-
height0.5s;


}
.sub-menu-wrap.open-menu{
max-height:400px;
}
.sub-
menu{background:rgb(252,
252,5);padding:20px;
margin:10px;
border-radius: 8%;


}
.user-
info{display
:fex;
align-items:center;
}
.user-info h3{
font-weight:500;
}
.user-infoimg{
```

```
width:60px;
border-radius:
50%;margin-
right:15px;
}
.sub-menu
hr{border:
0;height:
1px;width:10
0%;
background:#525252;
margin:15px010px;
}

.sub-menu-
link{display:f
ex;
align-items:center;
text-
decoraton:none;colo
r:
#525252;margin:12
px0;
}
.sub-menu-linkp{
width:100%;
```

```
}
.sub-menu-link
  img{width:40px;
```

```
    background:
    #e5e5e5;border-
    radius:
    50%;padding:8px;
    margin-right:15px;
}
.sub-menu-link
    span{font-size:
    22px;
    transiton:transform0.5s;
}
.sub-menu-link:hoverspan{
    transform:translateX(5px);
}
.sub-menu-link:hover
    p{font-weight:600;
}
.hello{
    margin-botom:
    200px;text-align:
    lef;positon:absolute;ri
    ght: 10px;


}
```

test.js

```
<script>
    letsubMenu=document.getElementById("subMenu");fu
    nctontoggleMenu(){
      subMenu.classList.toggle("open-menu");
    }
    window.watsonAssistantChatOptons={
           integratonID: "1a8c11c0-839e-4442-8b03-59f7c12ce5f5", // The ID
   ofthisintegraton.
      region:"au-syd",//Theregionyourintegratonis hostedin.
       serviceInstanceID: "bada3725-51e6-42fe-bccc-3e2603433478", // The
   IDofyourserviceinstance.
      onLoad:functon(instance){instance.render();}
    };
    setTimeout(functon(){
      constt=document.createElement('script');
         t.src="https://web-
   chat.global.assistant.watson.appdomain.cloud/versions/"+(window.watsonAssista
   ntChatOptons.clientVersion || 'latest') +"/WatsonAssistantChatEntry.js";
      document.head.appendChild(t);
    });
  </script>
```

chat.js

```
<script>
    let subMenu =
    document.getElementById("subMenu");functontoggle
    Menu(){
```

```
    subMenu.classList.toggle("open-menu");
  }
  window.watsonAssistantChatOptons={
        integratonID:"1a8c11c0-839e-4442-8b03-
 59f7c12ce5f5",//TheIDofthisintegraton.
    region:"au-syd",//Theregionyourintegratonis hostedin.
     serviceInstanceID:"bada3725-51e6-42fe-bccc-
 3e2603433478",//TheIDofyourserviceinstance.
    onLoad:functon(instance){instance.render();}
  };
  setTimeout(functon(){
    constt=document.createElement('script');
       t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/"
 +(window.watsonAssistantChatOptons.clientVersion    ||    'latest')
                                                      +"/WatsonAssistantC
 hatEntry.js";
    document.head.appendChild(t);
  });
</script>
```

DISCUSSION

This scholarly artcle has provided a comprehensive review of the methods,algorithmicmodelsandflteringtechniquesusedintherecentfashionrecommendaton-based research papers. However, this review paper has somelimitatons too. Primarily, the focus of this comprehensive review paper was toexplorefashionrecommendaton-basedartclespublishedinlastdecadethat explicitlydescribedtheirframeworks,algorithms,andflteringtechniques.Toachieve this goal, the artcles were searched using keywords relevant to the topicttle instead of using the PRISMA technique. However, it did not afect the artcleextractonmethodology,becausetheauthorsincludedandstudiedalltheresearch papers relevant to the research focus. However, future researcherscould conduct a systematc literature review on the same topic. The inital keywordsearching did not include “garment” and “outit”; however, this did not infuence thesearch results because we also studied the fashion recommendaton artcles thatcontained these keywords. The future research can also conduct a review of thedatasets that have been used in fashion recommendaton-based research artcles.Additonally, further reviews of fashion recommendaton systems can apply ourproposed potental algorithms to any of the available fashion image datasets toevaluatetheperformance ofthe recommendersystems.

CONCLUSION

Recommendaton systems have the potental to explore new opportunites forretailers by enabling them to provide customized recommendatons to consumersbasedoninformatonretrievedfromtheInternet.Theyhelpconsumerstoinstantl yfndtheproductsandservicesthatcloselymatchwiththeirchoices.Moreover,diferentstat-of-the-artalgorithmshavebeendevelopedtorecommendproductsbasedonusers’interactonswit htheirsocialgroups.Therefore,researchonembedding social media images within fashion recommendaton systems has gainedhugepopularityinrecenttmes.Thispaperpresentedareviewofthefashionrecomm endaton systems, algorithmic models and fltering techniques based on theacademicartclesrelatedtothistopic.Thetechnicalaspects,strengthsandweaknesses of the fltering techniques have been discussed elaborately, which willhelp future researchers gain an in- depth understanding of fashion recommendersystems.However,theproposedprototypesshouldbetestedincommercial applicatons to understand their feasibility and accuracy in the retail market, becauseinaccuraterecommendatonscanproduceanegatveimpactonacustomer.Moreo ver, future research should concentrate on including tme series analysis andaccuratecategorizatonofproduct imagesbased onthevariatonincolor,trendand clothingstyle inorder to developanefectverecommendatonsystem.

FUTURE SCOPE

Online selling and purchasing ofer innumerable benefts to both sellersand buyers, and these advantages are also the reasons for the rising scope ofeCommerceWell, to put it bluntly, the scope of e-business in the near future looksto be ever-increasing and growing, because the trend has really caught on here.E-commerce giant Amazon is keen to conquer the Indian market and has alreadyinvesteda greatdeal,especiallywith its49% stakeintheFutureGroup.

Indian online retail giant Flipkart has already opened a few ofine storesand plans more stores in smaller cites. They plan to combine online and ofinestores to maximize their selling potental.Google and Tata Trust have launched ajoint program ‘Saathi’ to increase internet and mobile penetraton among ruralwomen.The Government of India is also making a huge push for Ecommerce byproviding numerous sops to startups, cyberparks, and so on through its DigitalIndia program.As of now, there are close to 20,000 E-commerce companies inIndia,withmany moreexpectedtojoin thebandwagon everymonth.

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