E-commerce Sites with Outfit Composition using Deep Learning Method

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Abstract: The fashion industry has developed in many fields and its growth is making an enormous promote in article of clothing company and e-commerce entity. The difficult task for IT industry in this field is designing the predictive system of data mining to model this. E-commerce uses electronic communication as well as information technology in many transactions for creating, transforming or for redefining the relationships between individuals and organizations. It simply means buying of products, services and information and selling them through computer network. It is totally changing the traditional approach of business. The main change in business is noticeable growth and it has many significant effects on environment as well. This is the reason why it is so preferred in business nowadays. The important part of the proposed system is to rate the fashionable outfit individual and it is considers appearances as well as meta-data. Our approach has first implemented a system of encoding visual characteristics with the help of deep convolution network for complicated contents because it is not possible to list or to label every attribute of a image. Secondly, we proposed a multi-model deep learning framework for rich contexts of fashion outfit. We propose a system which will recommend with review comments and which product should purchase and the system will display a rating of the product.

Keywords: Convolutional neural Network, outfit product images, data mining

I. INTRODUCTION:

E-commerce uses electronic communication as well as information technology in many transactions for creating, transforming or for redefining the relationships between individuals and organizations. It simply means buying of products, services and information and selling them through computer network. It is totally changing the traditional approach of business. The main change in business is noticeable growth and it has many significant effects on environment as well. This is the reason why it is so preferred in business nowadays.

E-commerce websites is an important cluster composition for finding a good collection composition of almost everything. Composing E-commerce websites involve bottomless thoughtful of e-commerce principles while incorporate resourcefulness for choosing several e-commerce objects (e.g. clothing, mobile, shoes).

1.1 Driving forces behind E commerce

Following are some factors responsible for the popularity of E-commerce:

- Availability of customers worldwide
- Foreign product demands
- Availability of Transnational as well as Multinational Corporations
- Foreign raw material usage

1.2 Factors Affecting E-commerce:

The important factors affecting the E-commerce are categorized as follows:

1.2.1. Technical Factors:

- Infrastructure of Telecommunication
- New technical developments and their access
- Availability of bandwidth
- Rates of internet

1.2.2. Political Involvement:

- The initiatives by government to support the implementation of new technology
- Demoralizing regulations of government
- The interest of government for adopting the new technologies

1.2.3. Social Factors:

- Count of literate people
- Internet user's count
- Interest of people to learn new technology

1.2.4. Economic Factors:

- Economical progress of country
- The average income of individuals
- Hardware and software cost
- Telecommunication infrastructure usage charges.

II. RELATED WORK:

2.1 Clothing Style and Heterogeneous Co-occurrences

A. Veit et al. [1] proposed a framework which was able to recover a space of style for cloths with the help of information of number of occurrences and category labels. The framework designed understands compatibility between various items of different categories so it extends the traditional way of metric with Siamese networks which concentrate on recovering correspondences. This paper also explained a retrieval method with nearest neighbor with greater label noise [1], [5].

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By combining the proposed framework and nearest neighbor retrieval, outfits are generates from various categories. But this system was not able to incorporate the preferences of users.

2.2 Matching Street Clothing Photos:

M. H. Kiapour et al. [2], proposed a system for shopping with a goal of matching garment item to online shop. Used dataset is new. Using that dataset they proposed three different methods considering the approaches of learning similarity measures [5] between the two. These methods provided beginning step for accurate retrieval from online retailers. But the retrieval performance was low.

2.3. Similar styles retrieval:

K. Yamaguchi et al. [3], proposed parsing method which considers fashion image retrieval. This system combined three models namely global parse, nearest neighbors and transferred parse predictions. The proposed method used similarity based retrieval technique [5]. Experimental results obtained were beneficial in finding the scenario. But this paper did not consider the mixed fashion tradition.

2.4. Cross-Scenario Clothing Retrieval:

S. Liu et al. in [4], addressed a problem in cross scenario if considered retrieval in clothing. This system proposed two step calculation methods for obtaining the similarities between photo of daily query and all photos of online shopping. This paper did not consider the mixed fashion tradition like our does. The auxiliary sets are obtained by reconstruction of sparse and with the help of many to many similarity matrixes.

2.5. Magic Closet:

T. Zhang et al. in [6] explained a magic closet system which gives suggestions for suitable pairing provided user specifies the occasion. This paper used SVM based recommendation model for incorporating the matching rules. For implementing this model, they have used large clothing of clothing with full attributes. But this was limited by the current performance of human detector; some clothing in the user's clothing photo album may be misdirected.

III. PROPOSED METHODOLOGY:

We have used the deep learning technique to compose the whole outfit for the user. This task is done using various image processing techniques. Initially the user will be provided with all the images of various products belonging to different categories. The convolutional Neural Network (CNN) algorithm is being used in our project.

Figure 1 shows the detailed flow of composition. This architecture diagram gives us the flow of the algorithm and overall functionality of the system. The user of the system selects one product after which the process starts.
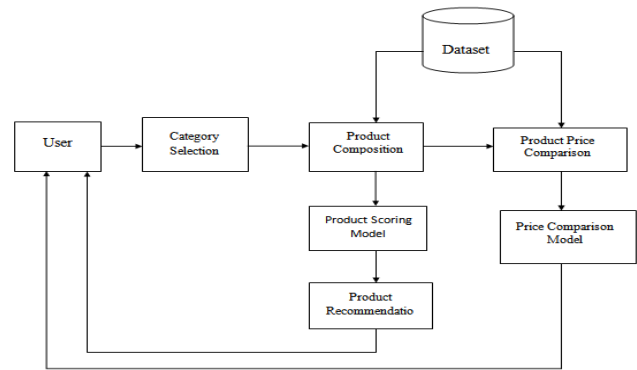

Fig1: System Architecture

The system architecture is divided into following models:

- **Product Categories:** This model is responsible to let user to select category.
- **Recommendation Model:** This model will provide recommendations to user according to selected categories.
- **Price Comparison Model:** This model will provide the price of a product from different websites.

3.1 Design of the Study:

Proposed Algorithm steps:

- **Step 1:** User registration
- **Step 2:** User login
- **Step 3:** Display all available products
- **Step 4:** User selects a particular product out of all the available (e.g. top)
- **Step 5:** CNN algorithm for feature extraction and classification
- **Step 6:** Complete outfit prediction

3.2 Convolutional Neural Network (CNN):

Convolutional neural networks are artificial neural networks which are mainly used for classifying images and then forming clusters by considering the similarities and also object recognition within the scenes is done. These are the algorithms which identifies faces as well as other symbols like street signs, tumors etc

Steps in CNN:

1. Convolution Layer- In this layer we apply filter (3*3) on image.

2. Pooling layer

3. Fully Connected layer- It is the fully connected layer of neurons at the end of CNN.
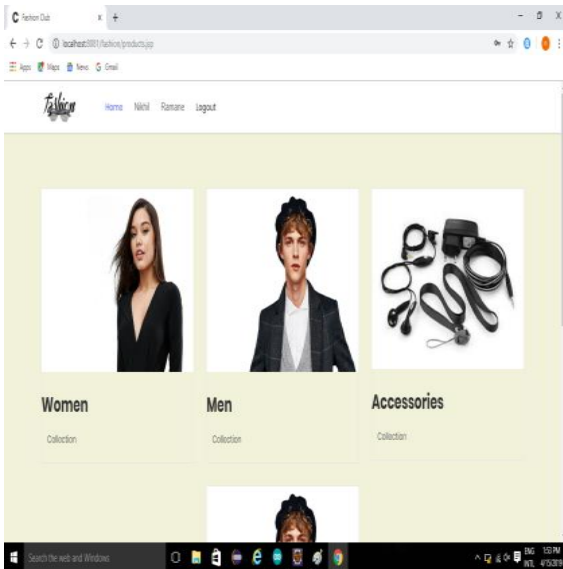
IV. RESULT SCREENSHOTS:
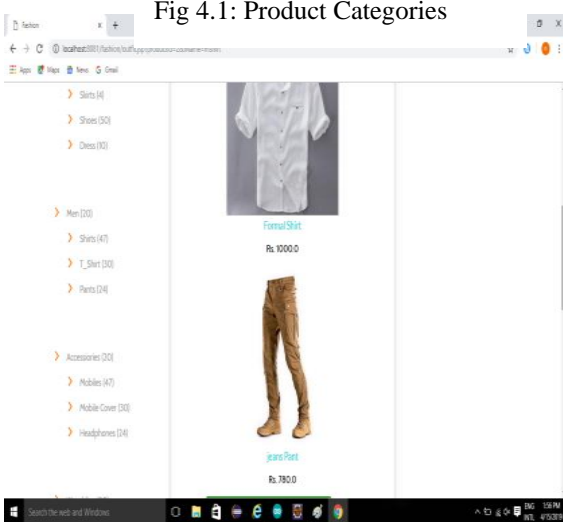

Fig 4.1: Product Categories
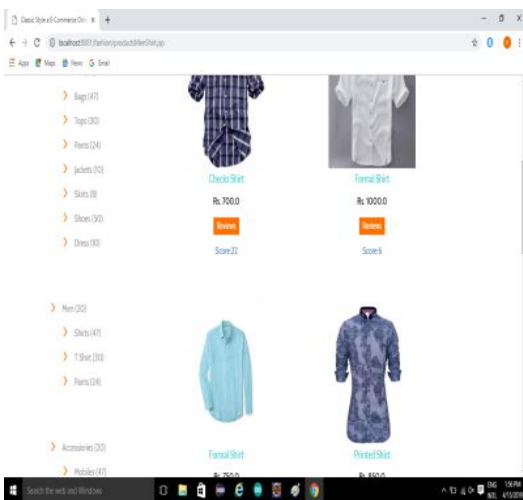

Fig 4.2: Product Recommendation
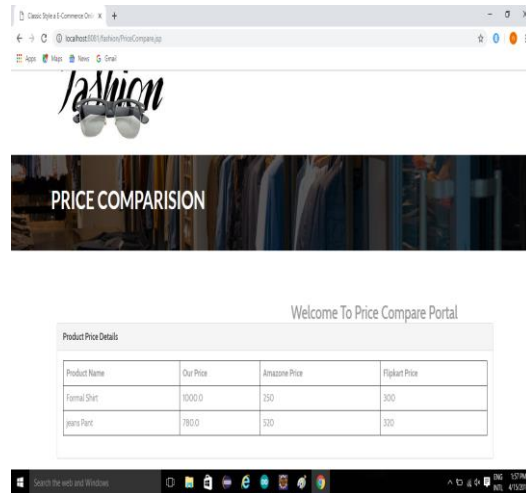

Fig 4.3: Product Reviews
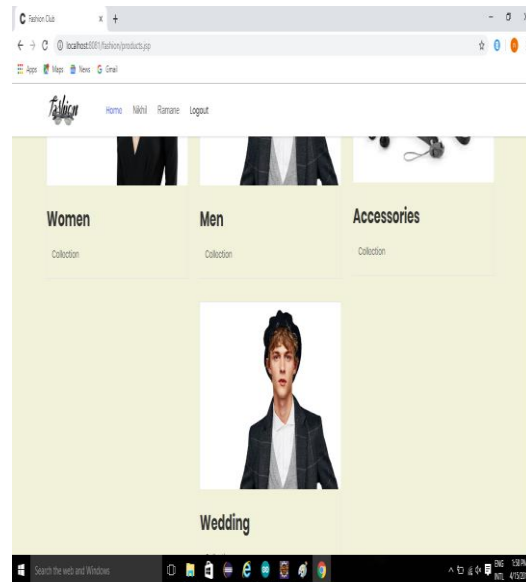

Fig 4.4: Price Comparison

Fig 4.5: Event Categories

V. CONCLUSION:

E-commerce uses electronic communication as well as information technology in many transactions for creating, transforming or for redefining the relationships between individuals and organizations. The proposed system recommend product to user in negligible time. It saves user's time and review comments and rating. The important thing is it compares the prices for product from different sites.

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