IDEATION PHASE

LITERATURE SURVEY FOR SMART FASHION RECOMMENDER APPLICATION :

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A recommendation system is a system that is programmed to predict future preferable items from a large set of collections. A recommendation system works either by using user preferences or by using the items most preferred by all users. The main challenge in building a fashion recommendation system is that it is a very dynamic industry. It changes very often when it comes to seasons, festivals, pandemic conditions like coronavirus and many more.

Unlike other areas, fashion recommendations shouldn't be based solely on personal taste and past activity of the customer. There are many external factors (many of which are emotional) that make creating a fashion recommendation system all the more complex. Public perceptions must be taken into account, as well as fashion rules, dress rules and current trends.

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The textile and apparel industries have grown tremendously over the last years. Customers no longer have to visit many stores, stand in long queues, or try on garments in dressing rooms as millions of products are now available in online catalogs. However, given the plethora of options available, an effective recommendation system is necessary to properly sort, order, and communicate relevant product material or information to users. Effective fashion RS can have a noticeable impact on billions of customers' shopping experiences and increase sales and revenues on the provider-side.

The goal of this survey is to provide a review of recommender systems that operate in the specific vertical domain of garment and fashion products. We have identified the most pressing challenges in fashion RS research and created a taxonomy that

categorizes the literature according to the objective they are trying to accomplish (e.g., item or outfit recommendation, size recommendation, explainability, among others) and type of side-information (users, items, context). We have also identified the most important evaluation goals and perspectives (outfit generation, outfit recommendation, pairing recommendation, and fill-in-the-blank outfit compatibility prediction) and the most commonly used datasets and evaluation metrics.

Fashion Recommendation System (FRS), Algorithmic Models and Filtering Techniques;

FRS can be defined as a means of feature matching between fashion products and users or consumers under specific matching criteria. Different research addressed apparel attributes such as the formulation of colors, clothing shapes, outfit or styles, patterns or prints and fabric structures or textures [10][58][66][67]. Guan et al. studied these features using image recognition, product attribute extraction and feature encoding. Researchers have also considered user features such as facial features, body shapes, personal choice or preference, locations and wearing occasions in predicting users' fashion interests [31][67][68][69][70]. A well-defined user profile can differentiate a more personalized or customized recommendation system from a conventional system [28][71]. Various research projects on apparel recommendation systems with personalized styling guideline and intelligent recommendation engines have been conducted based on similarity recommendation and expert advisor recommendation systems [10][58][72]. Image processing, image parsing, sensory engineering, computational algorithms, and computer vision techniques have been extensively employed to support these systems [32][73][74][75][76][77].

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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 development of 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 paper, 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 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 DeepFashion dataset and a nearest neighbour backed recommender to generate the final recommendations.

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Recommendation systems based on machine learning are very important both customers and sellers in our daily life. Many recommendation systems need user's previous shopping activities and digital footprints to make best recommendation purpose for next item shopping. In this study, we develop a cloth recommendation system with using only single photo of user with scalable embedded system. This study lead to important results and give new opportunities for clothing companies and advertisements. In this study, we show that how our system recommends a cloth options without user's previous shopping act data with embedded system and machine learning. In order to recommend a cloth, we develop two inception based convolutional neural networks as prediction part and one feed forward neural network as recommender. In this study, we reach to 98% accuracy on color prediction, 86% accuracy on gender and cloth's pattern predictions and 75% accuracy on clothing recommendation.

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AbstractDressing appropriately is very important when going out in the real world. Wearing clothes properly that show some level of style and wearing them such that they adhere to the norms of social standards uplifts the confidence of the person and creates a very good impression. The study focuses on helping the user to find optimized matching pair of clothes taking into account intricate details like style, patterns, colors, textures, etc. also keeping in mind users attributes like age, skin tone, favorite color etc. It aims to help the user choose clothes that are fashionable and organize their closet. It tries to help the user to wear clothes that are suitable to occasions and helps user to buy clothes that would suit their style. In this paper, an in depth study is performed of various systems that are developed for the various features that must be kept in mind for making a robust system that finds matching clothes of the user as well as makes recommendations. Systems developed to make recommendations of clothes using various approaches have been studied and their merits and demerits high-lighted. Systems that are used for clothes detection have also been studied to make the system user- friendly while the user provides input.

Myntra-Matching Clothes Recommendation:

On selecting a particular item to buy, Myntra automatically suggests a full set of clothes that are matching to the selected item. For example, on selecting a particular t-shirt, the system automatically generates a combination of watches, shoes, pants, etc. that are matching to the selected t-shirt. This system does not take into consideration private qualities of customers like skin color and existing clothes. It will only suggest clothes that already exist in its database.

Your Closet:

This is a mobile application that organizes the closet. The user interface is shown in Fig. 1. The application asks customer to input their clothes. It then matches each cloth with other clothes. For example, if there are 4 shirts and 4 pants, the application matches each shirt with each pant and thus provides 16 possibilities. The application does not make matches of clothes depending upon patterns, color and texture of clothes. It also does not have a recommendation system.

Magic Closet:

This system aims to retrieve clothes from online stores that are matching to the input clothes. These clothes must be fit to a particular occasion. In this system, the user takes a photo of them specifying if they want to use the top or bottom clothes along with the occasion they want to use it for. The system will search for clothing that matches the user query and satisfies the criterion of wearing aesthetically and wearing properly [1].

Which Clothes to wear confidently?

The basic problem the system addresses is: From the two given images corresponding to a pair of clothes, we have to determine if the pair of clothes matches or not. While there may be several aesthetics espoused by dierent individuals, it takes a simplistic approach in this problem. An example of shirts and ties is used. Various machine learning methods are used to classify if the clothes are matching or not such as Ridge Regression, Standard Neural Network and Siamese Neural Network [2].

Personalized Clothing Recommendation Based on Knowledge Graph:

This system attempts to exploit the knowledge graph for providing clothing recommendations to the user keeping the user context in mind. The recommendation is done by calculating the similarity in the clothing ontology similar to users collection [8].

Skin and Clothes matching seeded by Color System Selection:

The main aim of the system is to suggest clothes to user based on skin color. The paper first finds out which color scheme is best suited to represent skin colors and then tries to find a way to recommend if clothes and skin color match. An automated system to determine the highest levels of color suitability between skin and clothing was made [3]. The new

approach offered in this research was: the connectivity between the fuzzy membership functions of skin color and clothing [3].

Discerning Advisor:

The system tries to recommend clothes based on skin olor of the customer. Using a neural network, first the skin color is detected. Fuzzy logic is used to map a skin color to the skin color of a fashion model, and clothes suited to that model are recommended [4].

Garment Detectives:

The garment detection is to detect the presence of clothes in images and somewhat locate their extents, where the localization can be defined from coarse (image) level to fine (pixel) level [5]. A unified system is proposed for detecting and recognizing clothes in customer photos.

Identifying Corners of Clothes by Image Processing: This system aims to find the edges of the clothes for clothes manipulation. This system achieves this by finding pixels that represent the clothes. This system first accepts user image and then performs several image processing operations to improve the efficiency of edge detection. It then uses certain criterion to decide whether a pixel represents an image or not [6].

Real-time Clothing Recognition from Surveillance Videos [7]:

It is an analysis system of contents of video which is capable of tagging various clothes of different persons is created. First, face detection and tracking is performed and each frame is aligned. The system then proceeds to clothing segmentation using a variant of region growing method. Through this, clothes are detected. The system then proceeds to clothing recognition and indicates the type of clothing – skirt, t-shirt, etc. [7].