

# **Literary Survey**

<b>Date</b>	<b>19 September 2022</b>
<b>Team ID</b>	<b>PNT2022TMID30875</b>
<b>Project Name</b>	<b>Smart Fashion Recommender Application</b>

## **1. Cost Efficient Virtual Trial Rooms**

### **Authors:**

M Malathi , R Induja , S Mubarak , T Lalitha

### **Abstract:**

The recent covid-19 restrictions like social distancing has limited physical human interaction. There were days when people wish to visit the physical shopping outlets and try the best-suited outfits in the trial rooms. In the post-pandemic era, people are now preferring the E-shopping zone to select the outfits. This type of virtual shopping has its own disadvantages like the suitability of outfits to the customer's preferences. Regardless of some applications that offer outfit suitability, there are some entrust issues with online stores. This research study analyzes many general customer related concerns like fit of the outfit; appearance; color suitability with the customer skin tone and proposes the possibility of implementing virtual trial rooms. The proposed model empowers the clients to evaluate their outfits based on their stature, shape, size, and wellness estimations by standing in front of the gadget.

### **Conclusion:**

Subsequent to applying the fabric model with the improved execution joint position, this application has turned into an adequate application to give a virtual fitting space to the client to use: Human estimation produced by the client body remains before the Kinect. A malleable and realistic-looking material model can be worn by the client. The user interface

is so simple and easy to comprehend that even a beginner can understand it; also, there are many exciting and useful features in the program

## **2. Smart Fashion: A Review of AI Applications in Virtual Try-On & Fashion Synthesis**

### **Authors:**

Seyed Omid Mohammadi , Ahmad Kalhor

### **Abstract:**

The rapid progress of computer vision, machine learning, and artificial intelligence combined with the current growing urge for online shopping systems opened an excellent opportunity for the fashion industry. As a result, many studies worldwide are dedicated to modern fashion- related applications such as virtual try-on and fashion synthesis. However, the accelerated evolution speed of the field makes it hard to track these many research branches in a structured framework. This paper presents an overview of the matter, categorizing 110 relevant articles into multiple sub-categories and varieties of these tasks. An easy-to-use yet informative tabular format is used for this purpose. Such hierarchical application-based multi-label classification of studies increases the visibility of current research, promotes the field, provides research directions, and facilitates access to related studies.

### **Conclusion:**

Recent advancements in machine learning and artificial intelligence are helping ease the fashion industry's transition from customary stores into modern online shops equipped with high-tech features such as virtual try-on and fashion synthesis systems. This article sheds some light on different applications related to these systems, tracked the research progress through the years, and illustrated the field's rapid growth. Although scientists have achieved significant milestones, still many unsolved matters remain. One main issue is the systems' performance compared to human abilities; another important factor is the applicability of methods regarding computational effort and energy efficiency. Another critical problem is the definition of a well-structured and uniform objective metric to assess the results. To conclude, this area of research is highly active and any research in this fast-growing field, whether improving one of the branches discussed here or introducing new

applications, will be precious and potentially profitable for fashion e-commerce.

### **3. A Review on Outfit Fashion Recommendation System**

#### **Authors:**

Bhagyshree Pravin Bhure, Pratiksha Tulshiram Bansod, Monali Shivram Amgaokar, Savita Pralhad Lodiwale, Anjali Pravin Orkey, Ashish Mohod

#### **Abstract:**

With the quick rise in living standards, people's shopping passion grew, and their desire for clothing grew as well. A growing number of people are interested in fashion these days. However, when confronted with a large number of garments, consumers are forced to try them on multiple times, which takes time and energy. As a result of the suggested Fashion Recommendation System, a variety of online fashion businesses and web applications allow buyers to view collages of stylish items that look nice together. Clients and sellers benefit from such recommendations. On the one hand, customers can make smarter shopping decisions and discover new articles of clothes that complement one other. Complex outfit recommendations, on the other hand, assist vendors in selling more products, which has an impact on their business. FashionNet is made up of two parts: a feature network for extracting features and a matching network for calculating compatibility. A deep convolutional network is used to achieve the former. For the latter, a multi-layer completely connected network topology is used. For FashionNet, you must create and compare three different architectures. To achieve individualized recommendations, a two-stage training technique was created.

#### **Conclusion:**

As a result, finding a set of objective indicators, rather than subjective opinions, to evaluate the fashion level in clothing recommendation technology is critical and meaningful. This will pave the way for fashion multimedia mining in cyberspace. Our solution provides considerable convenience for customers in the fashion business by providing individualized and diverse fashion analyses and recommendations. On the one hand, it aids specialists in analyzing current trends in mass multimedia information. On the

other hand, it provides customers with expert advice on how to find their own particular fashion clothes match.

## **4. A Review of Modern Fashion Recommender Systems**

### **Author:**

Yashar Deldjoo, Fatemeh Nazary, Arnau Ramisa , Julian Mcauley, Giovanni Pellegrini, Alejandro Bellogin, Tommaso Di Noia,

### **Abstract:**

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.

### **Conclusion:**

In this survey, we have analyzed and classified the RS that function in a specific vertical market: clothes and fashion goods. In particular, we have introduced a taxonomy of fashion recommender systems, which categorizes them according to the task (e.g., item, outfit, size recommendation, explainability among others), and type of side information (users, items, context). We have also identified the most important evaluation goals (outfit generation, outfit recommendation, pair

recommendation, fill in the blank, and outfit compatibility prediction) and perspectives (evaluate the recommendation, the explanation, the generated images, or the social perspectives) exploited by the community, together with the most common datasets and evaluation metrics. This domain presents a unique collection of challenges and sub-problems pertinent to the development of successful recommender systems.

## **5. A Framework for Robust Feature Selection for Real-time Fashion Style Recommendation**

### **Authors:**

Xiaofei Chao, Mark J. Huiskes, Tommaso Gritti and Calina Ciuhu

### **Abstract:**

In this paper, we present the Smart Mirror system for fashion recommendation. The system uses intelligent vision technology to recognize clothing styles and supports real-time fashion recommendation. An important design challenge is to achieve sufficiently high style recognition accuracy while simultaneously offering robustness to input variations occurring in practice. We propose a framework for the selection of features that offer robust performance by assessing various evaluation measures under realistic deviations of optimal input data. The process is applied to a variety of low level features for clothing style description, including color histograms, local binary pattern (LBP) features and histogram of oriented gradient (HOG) features. We conclude the paper with an illustration of our results for web camera data and with a number of recommendations on how to move forward towards automatic.

### **Conclusion:**

In this paper we have proposed a framework for robust feature selection for real-time fashion style recommendation. For our smart mirror application, the approach has assisted us in selecting features that not only have better similarity discrimination but are also more robust to variations in the automatically selected region of interest. Since the approach is generic, we expect that the same procedures will be useful in future studies with features that target various fashion aspects more directly, e.g. based on explicit detection of body parts.

For different clothing classes, texture information determining the clothing style is distributed over different scales. If we use small block size then global information will be lost; if we use big block size some of the details are lost. Rather than relying on blocks of uniform size, we can use blocks of varying size, location, and aspect ratio. In future work we will address the combination of different features. Next to using feature weighting methods, we will also consider an Adaboost cascade to select feature blocks of different scales as.

Another possible extension that may improve the style discrimination rate is a weight map for the different ROI regions. For instance the upper central part of the ROI often contains the most crucial information (e.g. the opening of the chest area, and collar presence) for the style detection.

Currently, we only take into account the upper main body part. To determine the dressing style more accurately, we need to extend the system to include more body parts, i.e., the waist area, the neck (collar area), the arms (length of sleeve), and the presence of buttons. In this study we have focused on robust feature selection for fashion recommendation in the context of straightforward feature similarity measures. Naturally the availability of robust features for fashion recommendation would also be very promising in various other, more complex, interaction scenarios. One interesting possibility would be the addition of a relevance feedback interface that would extend the system by allowing the user to interactively guide it to provide truly personal recommendations.

## **6. Fashion Recommendation Systems, Models and Methods: A Review**

### **Author:**

Seyed Omid Mohammadi , Ahmad Kalhor

### **Abstract:**

In recent years, the textile and fashion industries have witnessed an enormous amount of growth in fast fashion. On e-commerce platforms, where numerous choices are available, an efficient recommendation system is required to sort, order, and efficiently convey relevant product content or information to users. Image-based fashion recommendation systems (FRSs) have attracted a huge amount of attention from fast fashion retailers as they

provide a personalized shopping experience to consumers. With the technological advancements, this branch of artificial intelligence exhibits a tremendous amount of potential in image processing, parsing, classification, and segmentation.

Despite its huge potential, the number of academic articles on this topic is limited. The available studies do not provide a rigorous review of fashion recommendation systems and the corresponding filtering techniques. To the best of the authors' knowledge, this is the first scholarly article to review the state-of-the-art fashion recommendation systems and the corresponding filtering techniques. In addition, this review also explores various potential models that could be implemented to develop fashion recommendation systems in the future. This paper will help researchers, academics, and practitioners who are interested in machine learning, computer vision, and fashion retailing to understand the characteristics of the different fashion recommendation systems.

### **Conclusion:**

Recommendation systems have the potential to explore new opportunities for retailers by enabling them to provide customized recommendations to consumers based on information retrieved from the Internet. They help consumers to instantly find the products and services that closely match with their choices. Moreover, different state-of-the-art algorithms have been developed to recommend products based on users' interactions with their social groups. Therefore, research on embedding social media images within fashion recommendation systems has gained huge popularity in recent times. This paper presented a review of the fashion recommendation systems, algorithmic models and filtering techniques based on the academic articles related to this topic. The technical aspects, strengths and weaknesses of the filtering techniques have been discussed elaborately, which will help future researchers gain an in-depth understanding of fashion recommender systems. However, the proposed prototypes should be tested in commercial applications to understand their feasibility and accuracy in the retail market, because inaccurate recommendations can produce a negative impact on a customer. Moreover, future research should concentrate on including time series analysis and accurate categorization of product images based on the variation in color, trend and clothing style in order to develop an effective recommendation system. The proposed model will follow brand-specific personalization campaigns and hence it will ensure highly curated and tailored offerings for users. Hence, this research will be highly beneficial for researchers interested

in using augmented and virtual reality features to develop recommendation systems.

## **7. Smart Fashion: A Review of AI Applications in the Fashion & Apparel Industry**

### **Author:**

aJisha, R.; Jyotirindranath, A.; Kumary, L.S.: Iot based school bus tracking and arrival time prediction. In: International Conference on Advances in Computing, Communications and Informatics (ICACCI), pp.

### **Abstract:**

The fashion industry is on the verge of an unprecedented change. The implementation of machine learning, computer vision, and artificial intelligence (AI) in fashion applications is opening lots of new opportunities for this industry. This paper provides a comprehensive survey on this matter, categorizing more than 580 related articles into 22 well-defined fashion-related tasks. Such structured task-based multi-label classification of fashion research articles provides researchers with explicit research directions and facilitates their access to the related studies, improving the visibility of studies simultaneously. For each task, a time chart is provided to analyze the progress through the years. Furthermore, we provide a list of 86 public fashion datasets accompanied by a list of suggested applications and additional information for each.

### **Conclusion:**

All the research through the years led to the birth of these fantastic smart fashion technologies, and they still have a long way to fulfill their true potential. Leading fashion industry companies are beginning to see the many advantages of intelligent fashion and are focusing their attention on this research area; thus, the field is now so vast that a mere customary keyword search might not be enough to access related research articles. This fact highlights the importance of this unified fashion-related task-based survey to draw new researchers' attention to the subject and point them towards correct research directions and sources. This field is becoming enormous, we categorized more than 580 articles into multiple task-based groups, and there are still many more. The observed trends and growth speed guarantees that we will soon witness numerous significant improvements that close the human-machine gap.



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