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A Survey on Fashion Prediction Analysis Using Artificial Intelligence

R.Jayakumar,

Ph.D. Research Scholar

Department of Computer Science

Sankara College of Science and Commerce

Saravanampatti, Coimbatore-35

jai.libero@gmail.com

Dr.A.Senthilkumar

Associate Professor

Department of Computer Science

Sankara College of Science and Commerce

Saravanampatti, Coimbatore-35.

senthask@gmail.com

ABSTRACT

Garments are inextricably linked to the evolution of human culture. The introduction of new technologies accelerates the garment design industry's progress. In the area of apparel, the impact of machines has increased in importance. The fashion industry gradually got used to being technical, automated and practical. Over the last few years, the fashion design sector has moved toward more technical platforms, such as computer design. This paper's primary focus is on how conventional fashion has evolved due to new media. It believes that human cognition is malleable, and design thinking is fluid, and where the style becomes. In the rare event that the organization begins manufacturing with an order received, the concept can't be actualized. The fashion trending has so many advantages: decreasing supply chain supply, avoiding delays in the supply chain, and maximizing profits due to inventory turnover. The purpose of this article is to examine different methods of predicting fashion sales. We also reviewed various retail forecasting techniques and evaluated their characteristics to determine which one will best fit our needs. We received synthetic data, pure mathematical models, artificial intelligence models, and AI-hybrid models from the checked literature.

Keywords: Artificial intelligence, Fast fashion, Fashion Prediction, Fashion analysis

Introduction

A person's physical appearance can have different effects, such as being pretty, cute. Society has grown to value personal image and outward appeal, which has made physical beauty a hot topic of research. Physical attractiveness is derived from evolutionary psychology and is directly proportional to [3]

Since the 21st century, the most amazing transformation has been the implementation of the LED architecture. This expression is commonly used to describe digital design's impact on

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society: "Digital life." In computers, modern and the internet, things can be designed, produced and even modeled and placed on a picture [4].

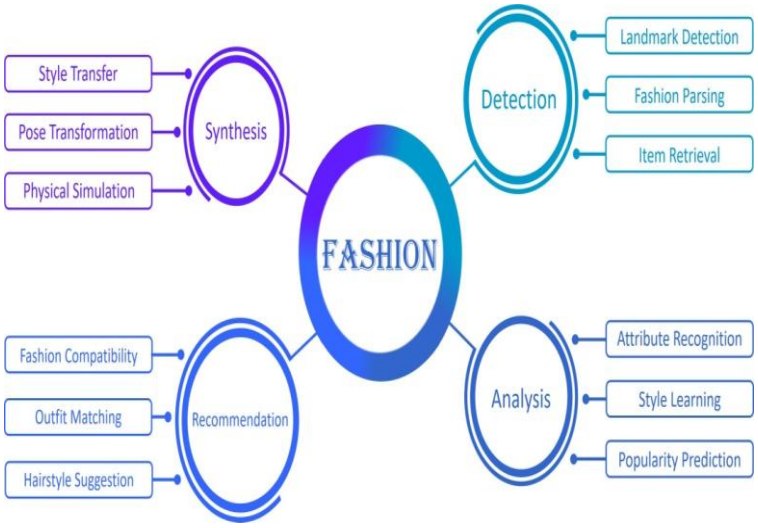

Figure 1: Intelligent fashion research topics

Compounding these effects is the significant growth in penetration in social networking and e-commerce, such as individual posts, fashion show trends, and rich, digital product information from e-commerce pages. As a result, harnessing large-scale cross-platform data through machine learning and computer vision is one of the critical technologies required to change the fashion industry fundamentally. In addition to communicating directly with customers through the internet, many well-known designers and retailers use leading social networks to gain insight into consumers' tastes, such as thoughts, views, reviews, and fashions [10].

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Figure 2. Applications of artificial intelligence in the fashion industry

The use of AI is worthwhile in the short term because it can alter fashion in various ways. Indeed, one of the industry's biggest concerns is the massive divide between architecture, production, and marketing. To improve fashion studies, the key issues include creating a large-scale data collection, figuring out a good feature representation of data, handling fashion appraisal, and bettering shopping experiences for customers; these three are the central concept [11].

However, limited meta-data has been studied to the extent that no analysis has been performed in conjunction with clothing photos. This framework will include several subsystems in both the design and decision-making to enable the designers to function as a little more effective tool. Some other methods focus on clustering, data processing, meta-data interpretation, and meta-searching to better aid them.

This research aims to discover new ways to apply artificial intelligence to clothes. The second part includes summarising previous works and fashion philosophy relevant to the current study. Before proceeding to methods, earlier implementation of AI is investigated and all of their significant problems are discussed in chapter 4. The last section is a discussion.

Background Study

As part of our analysis into fashion forecasting, we have read all of the existing literature. We also contrasted the various approaches for fashion forecasting, showing their main traits. Additionally, this study's articles provide practical implementations of fashion forecasting models in the modern world. We examined three summaries of pure statistical models, artificial intelligence (AI) models and mixed approaches (which include statistical models).

Chun-Sheng Wu, & Qiao-Ying Wu. [3] Aesthetics of body; otherwise, it is a superficial characteristic, no different from sound, smell, taste or other non-numerical aspects of personhood that have no bearing on a person's personality. The most recent study offers materials for researchers who work in textiles and clothes to explore female physical beauty, making them far more knowledgeable about various fashion strategies. This current project contributes to existing studies on the connection between human beings and nature and attractiveness and design to the definition of the actual human being. This thesis anticipates possible future uses of textiles and garment studies.

Dan-Dan, T., & Zhi-Qiang, W. [4] Clothing has been created to denote people's spiritual needs, and it has served as a sort of common resource for many cultures across the world. To become a suitable carrier for humans to show themselves, express human values, and spread history and culture.

Kuang, Z. et al. [6] The novel algorithm for hierarchical recognition was built by combining idea ontologies with hierarchical classifiers into end-to-end learning networks to learn classes. The proposed method may apply information transfer to complex problems due to frequent inter-class

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correlation. The experiments have confirmed our strategy. The Results showed that inter- also reveals the ability to distribute information among task networks can be improved by hierarchical distillation.

Liu, J. et al. [7] compatibility modeling between fashion products (e.g., lower body and upper body) (e.g., matching a pair of shoes for the given top and bottom). This network represented the preferences for various modes (i.e., fashion and textual items).

Shen, J., & Nicolaou, C. A. [9] Machine learning algorithms use modern AI algorithms, the plentiful supply of data and decentralized learning to have innovative new skills multi-tasking and federated knowledge. To put it another way, the writers want to highlight the value of similar benchmarking methods that measure the individual result. Without a proper reference point of contrast, every inference and comparison would be problematic.

Zhang, Y. et al. [12] A small write-up on recent fashion milestone research is offered, followed by the publication of some publicly available results. As far as we are aware, there was no well-documented survey that explored and evaluated the subject of milestone identification at this time. Handcrafted function-based approaches for activities in recent years, deep learning methods have become the preferred approach to feature detection.

Some Aspects in Fashion Analysis

We might argue that the classical works of art of the world's greatest treasures, and no matter how old they seem to us, they are among the most incredible world has ever seen. Yet, if modern art is presented to the 21st-century peoples. This occurrence is caused by the fact that their ancient views and visions are vastly different from contemporary people's thinking. To live in the metropolis every day, one has to be prepared to meet the many aspects of 21st-century urban life, including marketing, and so he says. Therefore, fashion designers are exposed to the effects of the new age on their artistic theory. Computer-generated images, multimedia cinemas, factories, all sorts of exotic computer graphics and an assortment of world-class industrial goods are only some of the things designers and makers are integrating into their designs and manufacturing processes today. New technology has increased at a steady pace since the year 2000.

- **Digital Design Tools**

Reflecting stunning fashions in a picture is undoubtedly beautiful. Thus, both input and output procedures are included for the computer-aided system. For example, consider a scanner and a digital camera will quickly scan drawings and images, enabling you to use it for image processing. We can work on the hand-painted canvas almost as soon as on the screen, and it is linked to the digital edition. If the designer's illustrations and style sketches can be printed at high resolution, they are great to carry and use. With modern cameras, fashion designers, images can be worked through at an astounding rate of speed. The current state-of-the-art hardware frees the creative designers to use new innovative approaches. The equipment's primary function is to have a unique and exclusive environment for creative people. Therefore, it is a dual enabler for both creativity and advancement. The modern method takes a short time and only a small amount of resources, allowing the older technique to come back.

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- **Low-level fashion recognition**

Fashion utilities pixel-level computing for clothes and landmarks. It's also suitable for determining pixel-wise attributes (e.g., hair, upper clothing, pants and hats). Semantic regions will further split the human anatomy into things to identify with clothes and something that can be worn. Clothing is difficult due to the extensive range of clothing pieces, layering possibilities, and obstructing items.

- **Middle-level fashion understanding**

Clothing is an effective and precise means of identifying individuals. Apart from color and design, cons involve materials, collars, lengths, cuts and fasteners. End-user innovative features may be used for fashion design retrieval, review as well as fashion recommendations. Types of clothes, on the other hands, are expressions of an individual's character and personal style.

- **High-level fashion applications**

In fashion identification, the low-level and the middle-level approaches support the high-level implementations, including Fashion retrieval begins by retrieving objects from an image database based on a question about the style's visual characteristics. Usage note: "Style advice" is described as offering clothing recommendations on certain situations or for a specific place or person (i.e., where, where, and to whom)." Often known as cross-style matching, this term refers to how much two different pieces complement each other.

Comparative Analysis of Survey

Table 1: Evaluation of various authors' views.

Author Name	Methodology	Limitations
Bin Shen, et al. [1]	Compare the impacts of apparel industry pricing and e-on-line social power.	It is seen as a comparatively new product or service in the industry using acceptance intentions as a replacement strategy.

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Baek, E., & Oh, G.-E. [2]	Based on the extent to which one is concerned with their clothing's health and aesthetics, fashion rental values are different.	This study is bound to have limits. Using a US study calls for potential experiments to provide generalizability and calls for confirmation with separate panel participants.
Dan-Dan, T., & Zhi-Qiang, W. [5]	According to the reports, if VR use is widely adopted, it would be particularly effective for those who anticipate a heavy VR embodiment and the absence of virtual existence.	While the German customer survey offers a broad description of how sales can be measured, it's only possible to study people who possess the devices limiting the study to those that can be more precise and targeted.
Kuang, Z. et al. [6]	Our innovative method for hierarchical concept recognition was built using hierarchical classifiers and deep networks to learn end-to-to-end concept trees.	The performance improvement in hierarchical recognition is contributed to the efficient fashion node and classifier functionality in various layers of our conceptual ontology.
Morisada, M. et al. [8]	The various behavioral patterns of their participants help members explain the variability of profitability among the different customers.	According to research, it is essential to understand consumers' lifestyle and psychographic characteristics while making segmentation decisions for fashion items.

Discussion

Human apparel helps express the spiritual desires of humans and becomes a symbol of societal wealth. It's serving as a good host for people, conveying human sentiments and passing around tradition and culture. Fashion enables you to explore yourself while providing self-esteem and worth, to assume that with the help of computers, contemporary fashion can illuminate new perspectives for the masses and unleash the designer's People's interests would be served. The new state-of-the-art information technology is becoming more prevalent in manufacturing—the latest fashion industry switches from hand-painted, digital, technical and powerful to contemporary knowledge design. In the garment business, clothes and apparel design, fashion is constantly changing. It will represent new digital trends and movements, following or staying with the speed of the times.

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- ***New Visual Perception***

At last, there will be a modern approach to graphic design when a picture is worth a thousand words with the power of a screen, no? Those computer-generated fashions offer the senses of humanity new possibilities to modern technologies; now, we use machines to fabricate variously and generate several fascinating results. Whether we use cotton, silk, weave, yarn or lattice-patterned cloth, we can turn it into fashion designs in software. Thus, digital visualization takes one into the physical world. The new three-dimensional fitting tech will still be a fad, but it will benefit both the customer and the manufacturer.

Conclusion

Artificial intelligence is essential to the apparel and garment industry, enabling them to move to the modern era. It's having a profound effect on many issues in the real world, including consumer buying habits, the impact of price levels on demand forecasts. This area of study is valuable. Before conducting this report, we examined recent articles for their ability to do a variety of similar activities. When it comes to studying fashion magazines, the use of artificial intelligence is applied. The publication information was obtained from the Scopus database using a key phrase question, which is essential for the research. This report's findings are controversial. Applying previous knowledge in related new investigations would serve the researchers well. On an overview of artificial intelligence usage, it was observed that the popularity of using artificial intelligence for fashion assessment increased over the past five years. There is space for much more investigation of this discipline. A keyword analysis is beneficial in determining the trend, for instance. Also, in non-fashion intellectual disciplines, research shows that it's significant in other fields such as material science, arts and humanities, and creative and vocational pursuits.

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