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DATA-DRIVEN APPROACHES IN FASHION DESIGN: STYLE CREATION THROUGH ALGORITHMS

SUMMARY

This article explores the influence of modern technologies—particularly data-driven directions and artificial intelligence (AI)—on the fashion industry. While data-driven design is a growing global trend, it remains relatively underexplored in Azerbaijan. The main goal of the research is to examine the methods of style formation through algorithms and to evaluate the potential for implementing such technologies in the local fashion sector.

Within the research framework, the theoretical foundation of data-driven design and data identification methods in fashion (such as social media, customer behavior, and e-commerce analytics) have been studied. The study also analyzes the work of digital designers using AI tools such as DALLE, Midjourney, Vue.ai, and Fashwell, along with the styles they produce. In addition, personalized fashion experiences and possible future ethical challenges in this direction are examined.

Keywords: Data-driven design, artificial intelligence, fashion algorithms, personalized design, digital designers.

Relevance of the Research and Problem Statement. In recent years, the influence of technology on the fashion industry has grown rapidly. In particular, we are witnessing the emergence of modern methods in fashion design through the integration of artificial intelligence (AI) and data-driven applications.

Data-driven design has gained widespread relevance globally, playing a significant role in both the creation of fashion products and the presentation of personalized designs. However, in Azerbaijan, scientific research in this field has not yet reached the expected level, and studies in this area remain limited.

This research aims to explore the potential applications of data-driven approaches in fashion design and examine how algorithms can be used to create style, contributing to the advancement of this innovative field in our country.

One of the key problems addressed in the study is the lack of systematic scientific research on the implementation of existing digital technologies in Azerbaijan. As a result, the technological potential in this domain is largely underutilized.

Research Objectives and Tasks. The main objective of this research is to examine the significant role of modern technologies-particularly data analytics and artificial intelligence-in today's fashion industry, and to scientifically investigate the potential of data-driven design applications as well as the methods of style formation through algorithms.

The study reviews international examples and also explores the applicability of these approaches within the Azerbaijani fashion industry. To achieve these goals, several academic and practical tasks have been identified.

First, the concept of data-driven design is analyzed in detail from theoretical and conceptual perspectives. Then, technological fashion platforms operating with algorithms and their practical application models are examined within the research.

Research Methodology. This study employs various methods to explore the implementation of data-driven design in the creation of clothing styles within the fashion industry, as well as the style generation capabilities of artificial intelligence tools. The methods used include:

Technological Analysis Method. Within the research, a technological analysis method was applied to examine the artificial intelligence and data-driven systems used in fashion design. Platforms such as Fashwell, Vue.ai, DALL·E, and IBM Watson were studied in terms of their functionality and efficiency in style creation.

The analysis focused on the principles of operation of these tools, including their data collection methods, pattern recognition, and style generation mechanisms. The study systematically evaluates how these technologies process large volumes of user and market data to generate fashion outputs and enable personalized design experiences.

Qualitative and Visual Analysis Method. AI-generated fashion style samples were analyzed based on practical examples using qualitative and visual analysis methods. Designs created by various artificial intelligence models were evaluated according to key criteria such as functionality, aesthetic value, and personalization.

This method enabled a deeper understanding of how AI-based systems reflect user preferences, current trends, and visual harmony within the context of modern fashion design.

Contextual Analysis. The current state of the fashion industry in Azerbaijan, the existing technological infrastructure, and the effectiveness of local designers in utilizing digital platforms have been examined. This section of the article aims to evaluate the potential for local implementation in this area and to present practical recommendations.

By analyzing the regional context, the study identifies existing challenges and opportunities for integrating data-driven and AI-based design approaches into the Azerbaijani fashion sector.

What is Data-Driven Design?

Data-driven design refers to an approach where design is based on empirical information. This model focuses not on the individual taste or personal intuition of the designer, but on the behavior of the user and market trends, operating in real-time with available data. This approach is particularly significant in the fashion industry, where it is crucial to address the ever-changing consumer demands and the need for personalized design samples. Data-driven design is not only about collecting information; it also involves analyzing the data and transforming it into visual forms. The process includes using key tools such as artificial intelligence (AI), machine learning (ML), data analytics, and big data models. For example, e-commerce platforms analyze user preferences, such as the colors and styles of products they like, in order to predict future trends and create personalized fashion solutions.

İn the fashion industry, data collection methods are based on several different approaches. The most commonly used methods are as follows:

Customer Behavior: In fashion, brands have always studied customer behavior by tracking which products they prefer, which clothing items they choose, and within which price range they tend to prioritize. This information is crucial for creating new style collections that align with customer demands and helps in formulating effective sales strategies.

Social Media: As we know, social media platforms (Instagram, Facebook, Twitter, etc.) hold significant and crucial importance in the fashion industry. Here, users share their style choices on their social media accounts, as well as mention the brands they follow and like. They also contribute to the spread of information in the fashion world through comments

and reactions. This helps brands gather such information, allowing them to better address customer interests and create more effective strategies.

E-Commerce Analytics: It is well known that online shopping uses various tools to track customer activity and enhance shopping habits. This includes collecting data on which products users view the most, which items they frequently add to their carts, and which ones they purchase most often. Based on this information, personalized offers can be presented to individual customers. Such methods help brands make more effective and accurate decisions while providing better and more efficient experiences in the digital environment.

Digital Designers and AI Models (DALL·E, MidJourney Fashion version, Fashwell, Vue.ai). As we know, digital designers nowadays are increasingly leveraging artificial intelligence technologies, which have become relevant in almost every field, to shape innovative approaches in fashion design. These systems primarily analyze visual information and generate new styles tailored to customer demands, thereby accelerating the overall design process.

DALL·E - is an artificial intelligence model developed by OpenAI. It primarily generates visual images based on textual descriptions, and this feature is widely used in fashion design. For example, it can create clothing sketches from specific descriptions provided by the user.

Consumer-Oriented Design: Personalized Fashion Experience. Consumer-oriented design is an approach focused on creating fashion items based on individual customer demands and preferences. This method uses artificial intelligence and data analytics to analyze each buyer's behavior and choices, offering them personalized clothing suggestions. In turn, this not only increases user satisfaction but also strengthens brands' competitive advantage in the market.

Future Opportunities and Ethical Challenges. If we focus on the future, it is undeniable that data-driven and AI-powered fashion design will become even more personalized, faster, and more efficient. However, alongside this advancement, issues such as copyright, the balance between human creativity and modern technology, as well as ethical concerns, will also come to the forefront and require careful consideration.

It is widely recognized that data-driven design holds great potential in the fields of fashion and apparel. In Azerbaijan, the implementation of this method requires the advancement of modern technological infrastructure and increased access to digital tools.

Young fashion designers are strongly encouraged to explore, apply, and learn modern technologies such as artificial intelligence and data analytics in order to enhance their creative processes and remain competitive in the evolving fashion industry.

In conclusion, as we know, the application of data-driven methods in the design process enables fashion designers to analyze market changes more deeply and create products that meet consumer needs and demands. Moreover, establishing new collaborations between design specialists working in the field of technology and fashion education institutions can further promote the practical implementation of data-driven design. Government-level support and targeted investments in this area can provide opportunities for young designers to acquire essential digital skills.

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MODA DİZAYNINDA DATA ƏSASLI YANAŞMALAR: ALQORİTMLƏR İLƏ ÜSLÜBUN YARADILMASI

XÜLASƏ

Bu məqalə müasir texnologiyaların, xüsusilə də data əsaslı yanaşmaların və süni intellektin (AL) moda sənayesine təsirini araşdırır. Data əsaslı dizayn dünya miqyasında artan bir tendensiya olsa da, Azərbaycanda hələ də nisbətən az tədqiq olunmuşdur. Tədqiqatın əsas məqsədi alqoritmlər vasitəsilə stilin formalaşdırılması metodlarını araşdırmaq və bu cür texnologiyaların yerli moda sahəsində tətbiqi potensialını qiymətləndirməkdir.

Tədqiqat çərçivəsində, moda sahəsində data əsaslı dizaynın nəzəri əsasları və data müəyyənləşdirmə üsulları (sosial media, müştəri davranışı, e-ticarət analitikası kimi) araşdırılmışdır. Eyni zamanda, DALLE, Midjourney, Vue.ai, Fashwell kimi süni intellekt alətlərini istifadə edən rəqəmsal dizaynerlərin fəaliyyəti və onların yaratdığı stillər təhlil edilmişdir. Bununla yanaşı, fərdiləşdirilmiş moda təcrübələri və bu istiqamətdə gələcəkdə qarşıya çıxa biləcək etik problemlər də tədqiq olunmuşdur.

Açar sözlər: Data əsaslı dizayn, süni intellekt, moda alqoritmləri, fərdiləşdirilmiş dizayn, rəqəmsal dizaynerlər.

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ПОДХОДЫ, ОРИЕНТИРОВАННЫЕ НА ДАННЫЕ В ДИЗАЙНЕ МОДЫ: СОЗДАНИЕ СТИЛЯ С ПОМОЩЬЮ АЛГОРИТМОВ

РЕЗЮМЕ

Данная статья исследует влияние современных технологий, в частности, основанных на данных подходов и искусственного интеллекта (ИИ), на модную индустрию. Несмотря на то, что дизайн, основанный на данных, является растущей глобальной тенденцией, в Азербайджане эта тема остается относительно малоизученной. Основная цель исследования - изучить методы формирования стиля через алгоритмы и оценить потенциал применения таких технологий в местном модном секторе.

В рамках исследования были изучены теоретические основы данных, а также методы сбора данных в модной отрасли (такие как социальные сети, поведение клиентов и аналитика электронной торговли). Также в исследовании анализируется работа цифровых дизайнеров с использованием ИИ-инструментов, таких как DALLE, Midjourney, Vue.ai и Fashwell, а также стили, которые они создают. Дополнительно рассматриваются персонализированные модные решения и возможные этические проблемы в будущем в этой области.

Ключевые слова: Дизайн на основе данных, искусственный интеллект, модные алгоритмы, персонализированный дизайн, цифровые дизайнеры.

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