

# A.I., FASHION AND RIGHTS

## THE RISE OF ARTIFICIAL INTELLIGENCE IN REDEFINING FASHION PARADIGMS

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Editorial

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Fashion Design, both in its theoretical foundation and practical application, is experiencing a significant cognitive transformation. This evolution is best interpreted not simply as a mere transition but as a continuous process of adaptation that affects professions, processes, and cultures (Anantrasirichai & Bull, 2022). This ongoing change necessitates a critical re-evaluation and recalibration of current ontological and epistemological frameworks (Dufva & Dufva, 2019; Kraus et al., 2021), emphasizing the need to redefine and reconsider the principles and methodologies in the Fashion Design field.

In this context, the emergence of artificial intelligence (AI) signifies the onset of an era of evolutions and revolutions in Fashion design thinking and practice, characterized by shifts, advancements, and radical changes (Ozmen Garibay et al., 2023). Fashion, traditionally reflective of societal, cultural, and economic dynamics, is now at a pivotal point due to the integration of AI into its processes. This transformation, both rapid and extensive, is reshaping the entire spectrum of the fashion industry, influencing various aspects such as design, production, customer purchasing experiences, and communication strategies (Särmäkari & Vänskä, 2022; Särmäkari, 2021).

This leads to a significant paradigmatic shift in the field of design: the evolution in the generation of images and forms, especially through the use of generative algorithms, facilitates the creation of high-quality and realistic content. This evolution expands creative possibilities (Wingström et al., 2023; Miller, 2020), while simultaneously introducing new ethical and methodological challenges (Siau, K., & Wang, W.; Luce, 2019). The arrival of these new tools is redefining the relationship between design and mathematics, between project and computational geometry, paving the way for an unprecedented interaction between different disciplines.

New directions in knowledge and methodology are fostering the development of innovative research paradigms, as AI stands as one of the most significant technological innovations of our time, deeply rooted in the data revolution (Tedeschi & Lombardi, 2017) and fundamentally based on mathematical and logical structures. These structures form the core of AI's ability to process, analyze, and interpret large volumes of data efficiently. Mathematics underpins the algorithms at the heart of AI, while machine learning and neural networks employ advanced calculations for continuous learning and improvement.

The shift fostered by AI includes data-centric decision making (Verganti et al., 2020), where AI's analysis of large datasets can inform and sometimes even influence design choices. AI can also intervene in creative abilities, enhancing them through generation tools and machine learning (Thompson et al., 2016). It simplifies problem solving with efficient computing and simulation capabilities and facilitates large-scale customization, allowing designs tailored to individual user preferences.

In the fashion design field, AI extends beyond personal consumer interactions, profoundly impacting the actual design processes (Särmäkari & Vänskä, 2022; Särmäkari, 2021; Luce, 2019). Designers, adapting to this AI-driven landscape, find their creative processes and problem-solving approaches being reshaped. The technology introduces a new paradigm in which design decisions are increasingly informed by data-driven insights. Consequently, the role of designers is evolving, requiring a harmonious blend of traditional creativity with AI's analytical capabilities, marking a significant evolution in both personal and professional realms influenced by AI.

On the one hand, the pervasive and nuanced integration of AI in daily activities marks a significant shift in how technology permeates everyday life. For individuals, this integration is evident in simple tasks, such as online shopping, where AI algorithms operate behind the scenes. By analyzing purchasing behaviors and personal preferences, these algorithms tailor experiences to individual needs, subtly guiding choices and shaping experiences (Andronie et al., 2021; Wong et al., 2013). This personalization raises significant questions about privacy and data management, highlighting the need to balance the benefits of customization with respect for individual privacy (Harrison et al., 2019; Xiong et al., 2019). On the other hand, the influence of AI in fashion exemplifies a broader paradigm shift where traditional processes are redefined by data-driven insights and innovative technological approaches. This shift in the fashion industry underscores how AI is not just a tool for efficiency but also a catalyst for reinventing creative and operational processes. In the fields of industry and manufacturing, the advancement of AI represents a critical transformation, marking its comprehensive integration into fundamental design and production processes (Gmenier et al., 2023). This development is a key aspect of the transition towards Industry 4.0 (Xiong et al., 2019), characterized by the integration of digital and intelligent technologies in manufactur-

ing. This evolution has led to the creation of advanced design software that interfaces with modern manufacturing technologies, such as additive manufacturing and the industrial Internet of Things (IoT). AI's role in these sectors extends beyond mere process automation, introducing new models of operational efficiency and multi-faceted collaboration that combine human creativity with algorithmic intelligence. Through predictive analysis and supply chain optimization, AI can contribute to reducing waste, promoting a more conscious and responsible consumption model (Van Wynsberghe, 2021). AI can anticipate trends and modulate production (Luce, 2019), thus encouraging more environmentally respectful practices.

AI tools today are equipped with predictive capabilities, enhancing forecasting and strategic planning. They provide deep analytical insights and tailor solutions to meet the specific requirements and contexts of design challenges. As a result, the field of design is experiencing an exploration of new areas, driven by data and AI's analytical power. The emerging synergy between human creativity and AI's computational power is reshaping the traditional limits of design, enabling designers to overcome previous constraints. This changing scenario presents a series of challenges and opportunities, requiring designers to navigate an ever-evolving environment and find a balance between creative intuition and the technical capabilities of AI.

A particularly complex area is that of intellectual property rights related to AI-generated designs (Lubart, 2005). Defining the ownership and authorship of a design created by an algorithm poses new legal challenges, necessitating updated and specific regulatory frameworks for the sector.

AI-driven automation in the fashion sector also raises important questions about social impact, particularly regarding the future of work (Wingström et al., 2023) and the role AI plays in the evolution of professional skills. It is crucial to consider how AI can both replace and enhance human labor, requiring careful consideration of the social and economic implications.

Another critical aspect is the risk of inherent bias in AI algorithms (Fujita, 2018; Ntoutsis et al., 2020), which could influence design and marketing choices in the fashion sector. Addressing these biases is essential to ensure that AI promotes inclusivity and diversity, rather than perpetuating existing stereotypes. Consequently, ethics in the use of AI becomes a central topic, requiring ongoing

reflection and careful regulation.

Looking to the future, the integration of emerging technologies like augmented and virtual reality, along with AI, promises to further transform the fashion industry, creating immersive and innovative shopping experiences. These developments open up a world of possibilities but also require a deep understanding of their potential ethical, social, and design implications.

Furthermore, as AI ingrains itself more profoundly in day-to-day activities, its influence permeates into the design sphere. Designers are progressively reconceptualizing AI as a "new design material" (Holmquist, 2017; Yildirim, 2022), perceiving it not merely as an auxiliary tool or technological adjunct but as an integral component of the creative process (Davis, 2013; Daniele & Song, 2019). This paradigm shift, while replete with intricacies and subtleties, demands a reevaluation of traditional design methodologies, beckoning designers to embrace AI as a collaborative partner in creativity. This novel approach unfurls a spectrum of unique possibilities and challenges, compelling designers to navigate an evolving landscape where the potential of AI is harmonized with human-centric design ethos.

The intersection between fashion and artificial intelligence is thus opening new creative and technological frontiers. It configures a scenario where fashion design increasingly characterizes itself in the design of rules, algorithms, and structures, even before the creation of imaginaries and forms, in search of convergence – or divergence – between artificial intelligence and human intelligence. However, these developments are not without challenges, opening up ethical and legal questions that must be addressed critically and reflectively to tackle central issues such as rights, ethics, and social responsibility.

The second issue of *Fashion Highlight Journal* situates itself within this evolving landscape, endeavoring to unravel and comprehend the multifaceted implications of integrating artificial intelligence in the realm of fashion design. Through the diverse perspectives and insights offered by its contributors, this issue aims to delve into the intricate ways AI is reshaping fashion design's traditional methodologies and creative processes. This issue particularly aims to encourage scholarly discussion regarding the interplay between fashion, artificial intelligence, and rights. It examines how the fashion sector, within a rapidly changing environment, is addressing key concerns related to pri-

vacy, intellectual property, inclusivity, skills development, and responsibility. A significant area of focus is exploring AI's potential to maintain diversity, function inclusively, and protect individual identities, highlighting its critical role in the context of contemporary fashion.

Greta Rizzi and Daria Casciani open the discourse with an article providing a comprehensive understanding of AI's evolution and its integration into fashion processes. Their work navigates through the stages of research, design, development, and manufacturing, tackling the ambiguity of AI terminology and highlighting the need for technological transformation toward sustainable fashion evolution.

Benedetta Giovanola, Simona Tiribelli, Emanuele Frontoni, and Marina Paolanti then take us through the complex data webs of the fashion domain. Their paper explores the powerful efficiency of AI in data interpretation, juxtaposing this technological breakthrough with the ethical challenges emerging in this digital evolution, emphasizing the need for robust frameworks for responsible AI use.

Barbara Pasa offers a three-dimensional exploration of AI in fashion design, considering complexity, education, training, and the 'Made in Italy' concept. Her essay is a reflective journey addressing socio-economic and cultural aspects, emphasizing the role of designers as co-regulators and rule-makers in the AI era, beyond the creation of mere forms and imaginaries.

Monica Titton critically examines contemporary fashion design through the lens of generative AI, using Demna Gvasalia's work at Balenciaga as a case study. She discusses the accelerated design process driven by market demands and proposes strategies to break the cycle of self-reference and copying prevalent in fashion design.

Patrizia Marti explores the impact of AI across the fashion lifecycle, addressing operational efficiency and personalization, while highlighting biases in AI systems. Her paper introduces feminist design principles as a means to envision more inclusive, equitable, and unbiased fashion discourse, advocating for AI-powered fashion that aligns with these principles.

Chiara Scarpitti, Arrarita Bianco, and Raffaele La

Marca reflect on the transformation of data mining into life mining, fed by the proliferation of electronic devices and wearables. They present fashion and jewelry design projects that subvert the surveillance system, charting new spaces of design thinking that challenge the prevailing logic in AI.

Victoria Rodriguez Schon and Chiara Colombi critically review AI's role in trend research within fashion. They scrutinize AI's ethical and nuanced analysis capabilities amid industry reliance on its speed and neutrality, urging for a responsible AI utilization that respects cultural nuances and social equities.

Moreover, Arrigo Bertacchini and Pietro Salvatore Pantano's study navigates the intersection of AI with the fashion industry. They emphasize the need for structured approaches to deploy AI in fashion, exploring its capacity to enhance and expand human creativity. The study also confronts the ethical quandaries posed by AI, particularly when trained on culturally specific data, potentially embedding biases, and the necessity for explainability in AI's decision-making processes.

Complementing this, Niccolò Musmeci and Pietro Salvatore Pantano's work delves into the intricate issues surrounding AI, such as originality, intellectual property, and the inherent biases in machine learning models. Their analysis pivots around the dual aspects of AI: the risks associated with its unchecked expansion, notably the undermining of human cognitive supremacy, and the prospects of creating a harmonious relationship between human intelligence and AI.

In the intricate system of fashion, scientific research is often the product of interrelationships and connections between different disciplinary areas, and Fashion Highlight aspires to serve as a space for open, transdisciplinary and intersectoral dialogue. The study of the interaction between fashion and Artificial Intelligence (AI) fits perfectly with the Fashion Highlight journal's scope: a sector deeply intertwined with social, cultural and economic dynamics, requires understanding from various perspectives including technological complexity, creative implications, marketing strategies, ethical concerns, legal and regulatory challenges, sustainability issues and human-computer interaction. As AI reshapes everything from design and

manufacturing to consumer experiences and communication strategies in fashion, it's clear that navigating this space requires a synthesis of different skills and points of view. This confluence of disciplines highlights the importance of collaborative and interdisciplinary discourse to fully grasp and exploit the transformative power of artificial intelligence in fashion and beyond.

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