

The Role of Artificial Intelligence in Reshaping Visual Merchandising Strategies: An Exploratory Study

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Abstract

This research explores the transformative role of Artificial Intelligence (AI) in visual merchandising. AI technologies are revolutionizing merchandising strategies by enabling personalized recommendations and optimizing displays in physical and online stores. The global artificial intelligence in retail market size was estimated at USD 11.61 billion in 2024 and is projected to reach USD 40.74 billion by 2030, growing at a CAGR of 23.0% from 2025 to 2030 (Grand View research, 2025). According to the author's analysis, AI enhances purchasing decisions, store exploration and brand differentiation. This research highlights AI-driven techniques, including personalized recommendations, product display techniques in showrooms and windows, and demand prediction, which create efficient shopping environments. This research also examines innovative display techniques, such as virtual try-on technologies, to create interactive shopping experiences. This research suggests that the AI analysis data-driven approach enables informed decisions on product placement and store layout, enhancing visual merchandising strategies. The integration of AI with visual merchandising significantly impacts consumer behavior, encouraging merchandise exploration and purchase intention. This research hypothesizes that AI-powered visual merchandising helps retailers differentiate themselves in competitive markets. As AI advances, its role in visual merchandising will grow, offering opportunities to engage consumers in immersive, data-driven experiences. This research highlights the influence of artificial intelligence on visual merchandising and its potential to transform the future of retail by creating personalized shopping environments. The research also contributes to understanding how AI reshapes retail through visual merchandising, offering insights into the benefits and challenges of AI-driven strategies and highlighting the importance of embracing these technologies in the evolving retail landscape.

Keywords

Artificial intelligence, Visual merchandising, Generative Adversarial Networks (GANs), Creativity Support Tools (CSTs), Generative Pre-trained Transformers (GPTs)

Paper received June 9, 2025, Accepted July 29, 2025, Published online November 1, 2025

Introduction:

There is limited direct information about the influence of AI on retail from the art and design perspective, which represents the aspect of visual merchandising in our study. Although artificial intelligence (AI) is widely integrated into retail environments to support operational and data-driven merchandising strategies, there remains a notable gap in academic literature addressing its influence from an art and design perspective. While Zhang & Brunn (2022) emphasize AI's role in optimizing store layouts and enhancing consumer engagement through predictive analytics, they acknowledge the lack of research concerning the

visual, experiential, and aesthetic dimensions of AI-enabled merchandising. Similarly, Anantrasirichai and Bull (2021) argue that although AI has made significant progress as a tool that augments human creativity, its autonomous contributions to artistic processes—particularly in design-focused retail contexts—remain modest and underexplored. The synergistic potential of integrating AI-based predictive analytics with other emerging technologies in retail, such as augmented reality and virtual reality. This integration could create immersive and highly personalized shopping experiences that blur the lines between online and offline retail channels. (Jayadatta S.,2023)

CITATION

Dalia Ezzat, et al, (2025), The Role of Artificial Intelligence in Reshaping Visual Merchandising Strategies: An Exploratory Study, International Design Journal, Vol. 15 No. 6, (November 2025) pp 29-38

Research Hypothesis:

- AI is transforming traditional visual merchandising strategies in retail.
- AI enables personalized product recommendations and optimized displays, which make the visual merchandiser's task more focused and efficient.
- AI support enhances the ability to influence purchasing decisions and encourage store exploration, as well support creating more engaging and interactive shopping experiences.

Research Question:

- To what extent can AI create personalized and effective visual merchandising solutions that enhance consumer engagement and increase sales.
- What are the challenges and opportunities that AI brings to the traditional visual merchandising processes and how it is transforming these methods into more personalized and interactive experiences.

Research Objectives:

- Investigating how AI technologies are currently influencing visual merchandising strategies within the retail sector.
- Offer insights into benefits and challenges of implementing AI-driven visual merchandising strategies.

Research Methodology:

- This research employs a literature review which represents the theoretical framework. It examines case studies of AI implementation in visual merchandising across retail environments, and analysis of current industry practices both physical and online, which represents the practical framework.

Research Terms:

- Artificial intelligence: "The capability of a computer system to show humanlike intelligent behavior characterized by certain core competencies, including perception, understanding, action, and learning." Wirtz et al. (2019). It encompasses various subfields, including machine learning, deep learning, natural language processing, computer vision and robotics.

Visual merchandising:

- Visual merchandising is a strategic retail practice that involves presenting and displaying products to enhance their appeal and stimulate consumer interest and purchases. It has evolved from a simple product-driven display function to a comprehensive approach

encompassing store-wide atmospherics and brand communication (Basu et al., 2022).

Generative Adversarial Networks (GANs):

Generative Adversarial Networks (GANs) represent an innovative category of deep generative models that have attracted considerable interest in artificial intelligence (Pan et al., 2019; Saxena & Cao, 2021). This is accomplished through competitive interactions between two networks, enabling the learning of deep representations without the need for extensively annotated training data (Creswell et al., 2017).

Creativity Support Tools (CSTs):

are interactive computing systems designed to enhance the creative capabilities of users, facilitating idea generation, exploration, and refinement across various domains such as design, art, music, and writing. These tools leverage human-computer collaboration to support divergent thinking, reduce cognitive load, and stimulate novel outputs. Shneiderman (2007)

Generative Pre-trained Transformers (GPTs) are a class of large language models based on the transformer architecture, designed to generate coherent and contextually appropriate text by predicting subsequent words in a sequence. These models are pre-trained on vast corpora of unlabelled text data to learn linguistic patterns, semantic relationships, and world knowledge, and can be fine-tuned for a wide range of natural language processing tasks (Brown et al., 2020)

Theoretical Frame Work:

Visual merchandising and Art correlation:

Visual merchandising and art share a close relationship, as both involve aesthetic elements and creative expression to evoke emotional responses and influence perceptions. Visual merchandising, particularly in retail environments, incorporates artistic principles to create visually appealing displays that attract consumers and communicate brand messages to them. According to (Park et al., 2014), visual merchandising can arouse consumers' in-store merchandise exploration, differentiate retail brands, and contribute to brand preference. In this study (Park et al., 2014) it was identified three dimensions of visual merchandising cognition: in-fashion, attractiveness, and function, which are closely related to artistic elements. Interestingly, the relationship between visual merchandising and art extends beyond aesthetics. In conclusion, visual merchandising can be considered an applied form of visual art that utilizes artistic principles and techniques to create engaging retail environments. The integration of artistic elements in visual

merchandising not only enhances aesthetic appeal but also influences consumer behavior and brand perceptions, making it a crucial aspect of modern retail strategy (Basu et al., 2022; Park et al., 2014).

An Overview of Artificial Intelligence from the Perspective of Arts and Design:

AI in art and design represents a transformative force that is revolutionizing creative processes across various domains. It serves as a powerful tool for enhancing productivity, fostering innovation, and personalizing user experiences in fields such as architecture, graphic design and product development (Agboola, 2024). In the visual arts, AI encompasses diverse applications, such as generative art through style transfer and Generative Adversarial Networks (GANs), enabling artists to produce novel compositions collaboratively with AI. It also extends to augmented and virtual reality, offering interactive and immersive experiences, while automated content creation tools assist artists with design tasks (Mousa Monser, 2023). AI's analytical capabilities contribute to art market analysis, authentication, and conservation efforts (Cetinic & She, 2022; Monser, 2023). Interestingly, while AI has made significant strides in visual arts and design, its application in art teaching remains limited (Kong, 2020).

How AI can directly influence visual merchandising as a creative design process:

AI can support the design creative process in various ways, enhancing efficiency, innovation, and the user experience. Generative machine learning models and large language models, such as GPT-3, can assist in the ideation, early prototyping, and sketching phases of design (Tholander & Jonsson, 2023). These tools can help designers extend, constrain, and blend ideas, thereby facilitating both divergent and convergent thinking (Jeon et al., 2021). AI-based creativity support tools (CSTs) can provide interactive visualization tools that aid in style exploration, trend analysis, and concept merging (Jeon et al., 2021). AI can be leveraged throughout the user experience (UX) design process, from understanding the context of use and uncovering user requirements to aiding solution design and design evaluation (Stige et al., 2023). Interestingly, AI serves as a creative collaborator, working with human users in real time to generate creative outcomes, performances, and artifacts (McCormack et al., 2020). From the author's

perspective, this collaboration has the capacity to improve design iterations, speed up prototyping, and make high-quality resources more accessible, thus making the design process both more inclusive and efficient.

In conclusion, AI can expand the creative process by helping designers overcome human limitations and inspire new approaches to creativity (Ali Elfa & Dawood, 2023). However, The author posits that the effective implementation necessitates a harmonious integration of technological proficiency and innovative design thinking, with human involvement remaining central to the process.

As AI continues to evolve, it promises to further revolutionize the design landscape by fostering collaborative human-machine interactions and pushing the boundaries of creativity. AI technologies offer designers unprecedented opportunities to push the creative boundaries and develop innovative solutions. These advancements enable the creation of designs that seamlessly blend functionality, aesthetic appeal and sustainability. By harnessing AI's capabilities, designers can analyze vast amounts of data, generate complex patterns, and optimize designs for various parameters simultaneously. This leads to the development of products and spaces that are not only visually striking but also environmentally conscious and socially responsible (Agboola, 2024).

In this context, the author suggests that artificial intelligence (AI) can assist in developing visual merchandising strategies that are adaptable to various retail scenarios. It can support every stage of the creative process if designers collaborate with it as a teammate, providing robust input to the model to achieve the most advantageous outputs. Furthermore, the primary advantage identified by researchers in the use of AI in the design process is its capacity to establish a highly efficient data network that highlights critical design aspects. This capability is particularly beneficial for visual merchandising, which plays a pivotal role in influencing retail businesses. For instance, when products are arranged using a specific display technique, AI can monitor their performance, identify challenges, propose enhancement actions if necessary, and subsequently test these improvements. This process significantly reduces the time and effort required.

The impact of artificial intelligence on visual merchandising strategies (online and offline)



Fig(1): 3D Hologram virtual try-on technology, as personalized solution for customers

Source: 3D Hologram Solutions for Retail & Sales | Holographic Technology - HYPERVSN

AI can potentially be used to optimize visual merchandising strategies by analyzing consumer behavior and preferences. For example, Muñoz-Leiva et al. (2023) mention that "virtual reality and augmented reality using neuroscientific methods will be applied to the e-merchandising context" in the future, suggesting that AI could play a role in creating more immersive and personalized visual merchandising experiences. As an example, Fig (2) shows a fully rendered, walk-through 3D store environment accessible via a browser, where users can explore products as though walking through a physical boutique. This type of virtual showroom emphasizes spatial design, lighting, and product placement—all customizable to reflect brand identity.



Fig(2): interactive Web-based virtual store.

Source: <https://liminastudios.com/>

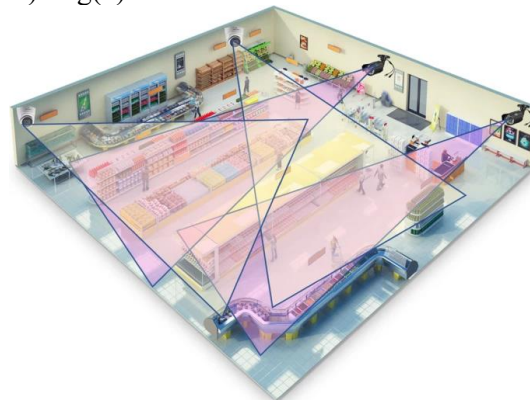
AI may contribute to the development of intelligent evaluation methods for visual merchandising. In the context of online visual merchandising, AI can be used to create customizable virtual stores. Wu et al. (2015) discusses "future development of customizable virtual stores for online retailing," where AI could potentially assist in generating personalized visual merchandising directives based on user preferences and behavior. Fig(3)



Fig(3): Augmented Reality (AR) Overlay

Source: <https://apviz.io/blog/virtual-shopping/>

AI may be employed to analyze and optimize various dimensions of visual merchandising, such as window displays, in-store form/mannequin displays, floor merchandising, and promotional signage, as mentioned by Mehta and Chugan (2013). This could lead to more data-driven decision-making in the field of visual merchandising. With this data, the Task of Visual merchandisers as creators is more definitive and efficient. A good example is the eye-tracking technology studies in virtual retail environments provide insights into consumer attention and emotional arousal, helping retailers design more engaging store layouts and displays (Kim and Lee, 2021). Fig(4)



Fig(4): Widely-employed security CCTV cameras in retail stores can provide in-store customer-behaviour insights to inform and improve store layout design

Source: When AI meets store layout design: a review | Artificial Intelligence Review

The integration of artificial intelligence (AI) provides a powerful digital transformation experience in retail stores. However, it is important to note that while AI can greatly assist in the design process, it may not fully replace human creativity. Architects and designers can leverage AI technologies to handle non-creative tasks efficiently, allowing them more time for innovative processes. From the author's perspective, AI can support within the creative process, idea

development, and achieving optimal results while presenting innovative designs. Accordingly, This research suggests that by combining AI capabilities with human creativity, retailers can create more engaging, efficient, and customer-centric store environments.

Practical Framework:

I-Case study: Successful practices of AI in Visual merchandising strategies:

Nike – Adaptive Retail Design with AI (Nike’s Air for Athletes campaign the House of Innovation.)

Location: Paris Strategy: Nike Paris transformed its flagship into an immersive Air-centric experience, spanning four floors and integrating interactive art and tech. The takeover was centered around Air Max Dn and Air Max Pulse launches, merging athlete storytelling, AI visuals, and digital art.

Reasons for this case study selection:

The rationale for selecting this case study lies in its representation of an immersive and interactive retail design, wherein artificial intelligence is regarded as a co-creator of spatial and visual art, rather than merely a technological layer. It provides a contemporary, high-profile, real-world application from a global brand, exploring new paradigms in emotive visual merchandising beyond mere automation.

Key features and Innovations by AI:

AI-Generated Interactive Installations:

1- “Feeling of Air” Remix Station

At the entrance, visitors could play with a touch interface to generate DALL·E 2-powered visuals based on their personal sentiment of “air.” These visuals evolved dynamically with background music, offering a playful, generative-art experience. Fig(10)



Fig(10):“Feeling of Air” Remix Station,Nike’s Air for Athletes campaign at the House of Innovation.

Source: jordivanderoord.com

2. Holographic 3D Sneaker Display:

Fig (11) represents the new Air Max Dn via holographic displays, allowing shoppers to inspect shoe construction in 3D and interact with the

products. This combined hyper-real visuals with narrative depth, informing on performance tech while feeling sculptural.



Fig.(11): HYPERVSN’s Hologram 360 stations, Nike “House of Innovation” in Paris.

Source: HYPERVSN X Nike's House of Innovation
- The Luxury Report

3. Air Arena: Experiential Art & Visual Merchandising:

As illustrated in Fig(12), the ground floor was transformed into a theatrical stadium, featuring vibrant bleachers, floating mannequin displays showcasing Air technology, and a sensory floor that responded to movement and sound.



Fig(12): Stadium-style Air Arena,Nike’s Air for Athletes campaign the House of Innovation

Source:

bureau.coolparisontheground.com+8random.studio
+8random.studio+8.

4. Custom Air Studio & Athlete Worlds

In Fig (13), it is shown the interactive Customization hub with giant digital screens that acts as a main influencer for the store atmosphere and that includes all its entities and blend them together, Visitors could personalize their own Air designs in a dynamic studio, surrounded by digital screens and an emotive atmosphere, moreover Upper floors were dedicated to Nike athletes—Mbappé, Kipchoge, Richardson—immersing visitors in their journeys via visuals, gear, and narrative art. Fig(14)



Fig(13)Interactive Customization Hub,Nike's Air for Athletes campaign the House of Innovation
Source:

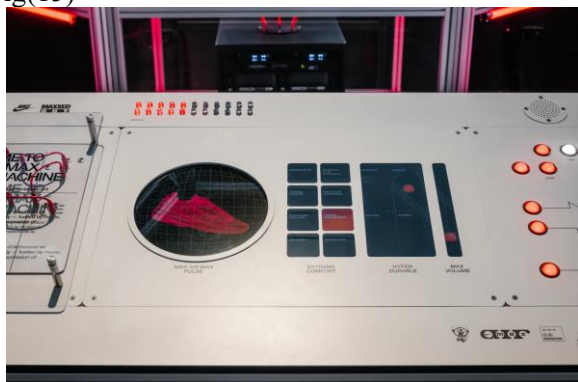
random.studio+1random.studio+1about.nike.com



Fig(14): Athlete Story Zones,Nike's Air for Athletes campaign the House of Innovation
Source: Courtesy of Nike

5. AI Visuals Amplifying Booth & Activation Response

This represents a Visual art reacting in real time to ambient sound and user input—supporting the immersive mood of Air Max Pulse experiences. Fig(15)



Fig(15): Audio-Reactive AI Installations
Source:

reddit.com+7bureau.cool+7jordivanderoord.com+7

Data-driven Digital Content:

Generative visuals were displayed on LED pillars and walls, adapting based on user interactions and showcasing sneaker tech in a constantly evolving visual stream.

Outcome and impact:

Elevated Engagement: Participants spent more time in the store engaging with generative art stations and athlete zones.

Conversion Effect: Interactive tech correlated with increased try-ons and purchases.

Brand Perception: Reinforced Nike's image as a tech-forward, art-driven innovator in retail.

Omnichannel Integration: AI visuals connected physical activity (movement/music) with digital narratives, supporting Nike's seamless ecosystem.

II-Self practice:

The author conducted an experiment involving AI models using a straightforward case study to assess the results. The researcher introduced a room design from an IKEA store to Chat GPT, giving it some information about the IKEA Room settings Matrix, criteria, and the challenges. The AI was then given the task to analyze, evaluate, and suggest opportunities for improvement.

The room in the first bedroom cluster represents the first impression for the bedroom area, it is a smart room in international modern style.



Fig(5): Real photo for a bedroom in IKEA Karlsruhe store, given for chat GPT to analyze, evaluate and propose opportunities.

Source: Taken by the author from IKEA Karlsruhe Store-Germany

The following was the standard version of Chat GPT output for this room setting:

"Thank you for sharing these images. The room setting you've designed is clean, calming, and well-composed—a strong example of IKEA's current Scandinavian modern aesthetic."

"Here's how we can build from this to shape a novel AI- and art-inspired visual merchandising methodology that enhances physical store engagement, solves conversion challenges, and integrates cost-efficiency".

1. What This Room Shows Us

• Current Strengths:

- Harmonious color palette (cool tones with navy accents).

- Clear story and function (bedroom with a relaxing seating corner).
- Balanced lighting and texture usage (pendant lights, soft rugs, plush textiles).
- Wall message: "Ein Raum, der aus deinen Routinen Rituale macht" supports emotional connection. a German text because ChatGPT knows that the room is in germany

• Opportunities for Evolution

- Static experience: No interaction or layered storytelling experience.
- Passive product engagement: Customers view but do not immerse or experiment.
- Limited narrative depth: It does not yet provoke curiosity or emotional exploration beyond function.

Feature	Description
Sound zone	Play gentle morning city sounds or a custom Spotify playlist related to the room's persona.
Interactive QR code	Scan to: "Change this room!" → Try lighting modes, swap cushions, and reveal hidden storage.
Persona Story Tag	"Nina, 34, lives in a 49m ² flat, meditates at 6AM, writes poems. This is her sanctuary."
AI Feedback Loop	Visitors rate the vibe ("Love it / Meh / Confused"), feeding AI to refine future setups.

Table (1): Recommendations for improvement suggested by Chat GPT

Source: ChatGPT

The author then asked Chat GPT for a prototype proposal to enhance this room, and the results were as follows:

Case study findings:

- The AI description was quite good; however, the AI failed to recognize the room style, which is international modern, not Scandinavian modern, which means that the input given was not sufficient to give an accurate output at this point.
- AI was able to detect the features of the design in the photo, even from a wide deep perspective, and not a high-quality JPEG.
- The opportunities for evolution were to the point and aligned with the main task that AI was asked to do.
- The visual output from ChatGPT wasn't meeting the evolution data it recommended, and it was very poor visual output from the author's perspective.
- There is a good potential for good visual generative images from Image generator GPT, that was able to reflect the data driven by ChatGPT into a better visual evolution for the same given room.

Artificial Intelligence: Exploring the Benefits and Challenges of AI-Driven Visual Merchandising Design

AI in art and design is a multifaceted phenomenon that spans creative collaboration and analytical tools, reshaping traditional practices and opening new avenues for artistic expression. As AI continues to evolve, it promises to further redefine the boundaries of creativity, offering both opportunities and challenges for artists, designers, and educators (Egon et al., 2023).

From another perspective, Ed Newton-REX (2025) sees that although AI can support artists and designers to be more creative, it represents a risk that threatens the creators' professions. In March 2025, in a TED talk, Ed Newton-Rex raised the topic of how Generative AI steals creative work and what to do about it. He explained that AI companies invest heavily in the first two key resources of AI, which are people and computing, and do not invest in data, which is the third key factor. He said, "They often use unlicensed creative work as training data without permission or payment, a practice that pits AI against the very creators it relies on." He stated that the only fair way to keep the rights of creators is through licensing. He critically examined the negative aspects of contemporary AI models and proposed a strategy to ensure the mutual prosperity of AI companies and creators.

In an interview with Jeremy Utley (2025) about AI powered creativity, he suggested that the best way to empower creativity is to deal with AI as a teammate not as a tool, so that designers should coach it give it feedback and get it to ask them questions that bring inspiration to the model, also bringing Techniques and perspective, he also stated that Creativity definition is still the same even after AI "it is just that the human's ability or inability to arrive at a creative state is affected not only by Technology but also by their stated or unstated objectives in collaborating with it." (Jeremy Utley, 2025) . Reflecting on Jermey's perspective, and after conducting several trials, the author finds this viewpoint highly valid. It is suggested that designers embrace this partnership with technology to explore the limitless possibilities it offers. This

endeavor requires numerous trials and errors, as well as extensive practice, enabling designers to discern the stages of the creative process where technology can assist in achieving these boundless possibilities.

Although the potential of artificial intelligence in design is substantial, its effective integration necessitates a nuanced approach. Designers must carefully consider the ethical implications, potential biases, and limitations of AI systems when designing them. Striking a balance between human creativity and machine-driven processes is essential to harness AI's full potential while maintaining the human touch that is often crucial in design. Additionally, designers must develop new skills to collaborate effectively with AI tools and interpret their outputs. By addressing these challenges and embracing the opportunities presented by AI, designers can create innovative, efficient, and impactful solutions that cater to the evolving needs of society and the environment (Adeyeye & Akanbi, 2024).

In conclusion, critical AI design requires a comprehensive approach that considers ethical implications throughout the development process. The Ethics by Design for AI (EbD-AI) approach, adopted by the European Commission, offers a systematic and comprehensive method for including ethical considerations in the design and development of AI systems (Brey & Dainow, 2023). This approach, along with others mentioned, emphasizes the importance of addressing ethical challenges to ensure responsible and beneficial AI implementation across sectors.

Research Conclusion:

The incorporation of artificial intelligence into store design and visual merchandising has revolutionized the shopping experience. Initiatives such as Nike's personalization efforts exemplify how technology can facilitate personalized and engaging customer interactions. As AI continues to advance, further innovations are anticipated to emerge, integrating technology with retail design to create more intelligent shopping environments tailored to the specific needs of consumers.

We can categorize the role of artificial intelligence in visual merchandising strategies into two primary streams:

- **Data-Driven Insights:** Artificial intelligence (AI) facilitates the analysis of customer data, sales trends, and shopping behaviors to inform visual merchandising strategies, thereby ensuring that displays effectively engage target audiences. For instance, an online retailer employs AI to examine browsing and purchase histories and subsequently recommends

optimal product placements on the homepage.

- **Automated Design:** AI-powered tools can automate the creation of visual displays, ranging from digital mockups to in-store displays, thereby ensuring consistency and efficiency in design. For example, a department store utilizes AI to generate visual-display designs that correspond with seasonal themes and promotional campaigns.

As investigated in the practical section, the integration of AI techniques with traditional visual merchandising techniques arouse in-store merchandise exploration, differentiating retail brands, and encouraging purchase intentions was analyzed. The research also considers the potential future developments of AI in visual merchandising and its implications for the retail industry. Artificial intelligence (AI) is revolutionizing visual merchandising techniques in the retail sector, shaping the future of consumer experiences. AI-powered technologies enable personalized product recommendations based on consumer behavior and optimize product displays and arrangements in both physical and online stores. AI's capacity to analyze vast amounts of data allows for more effective inventory management and demand prediction, further improving visual merchandising strategies. This study also examines how AI facilitates innovative display techniques, such as virtual try-on technologies, to create more engaging and interactive shopping experiences. As AI continues to advance, its role in visual merchandising is expected to expand, offering retailers new opportunities to engage consumers and drive sales using data-driven, personalized approaches. This research highlights the transformative impact of AI on visual merchandising and its potential to shape the future of retail by creating tailored, efficient, and compelling shopping environments.

Research Recommendations:

- This research suggests for designers to learn the AI algorithms and machine learning language to be able to get the best benefits out of AI in arts and design.
- The research also implies the consideration of AI in formulating visual merchandising strategies to achieve more efficient outcomes.
- It is advisable to establish more explicit rules and regulations concerning ethical constraints to protect the copyrights of novel creators.
- It is recommended to explore different GPTs to use the suitable ones for the right purpose, to work efficiently with good results.

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