



Unleashing the Potential:

Exploring the Impact of Artificial Intelligence on Fashion Design Using Midjourney

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Introduction The rapid advancement of Artificial Intelligence (AI) has had a profound impact on diverse industries and individuals' daily routines (Jaruga-Rozdolska, 2022). For instance, ChatGPT, an advanced conversational AI tool, achieved a staggering user base of over 1 million within a mere five days of its launch in 2022, surpassing the time taken by Facebook (10 months) and Instagram (2 months) to reach the same milestone (Boymamatovich, 2023). In that same year, Midjourney, an esteemed AI image-generation program based on diffusion modeling, garnered intensive attention for its ability to produce high-quality visual effects based on textual descriptions. This recognition was further exemplified when the Colorado State Fair's annual art competition awarded a prize to a new artist whose submission was created with the assistance of Midjourney (Roose, 2022).

AI, which imitates human intelligence to perform complex tasks like data analysis, information processing, and object and sound recognition, enables autonomous problem-solving and creative capabilities (Jaruga-Rozdolska, 2022). Its utilization spans various domains, including natural language processing and autonomous vehicles, with expectations of further proliferation (Boymamatovich, 2023). AI-powered tools, such as Midjourney, can generate high aesthetic visual effects and might have a significant impact on the future of the fashion industry, particularly fashion design. Several recent studies have investigated the impact of using Midjourney on art and design creation. For instance, Jaruga-Rozdolska (2022) explored Midjourney's potential in architectural design, while Ruskov (2023) explored its assistance in generating fairytale illustrations. However, there is still a dearth of research on the influence of AI on fashion design. Thus, this study aims to investigate the potential and limitations of using Midjourney in developing fashion design, using an action research approach.

Method Scholars have employed action research as a means of developing both products and new theories in software engineering by engaging in specific projects as practitioners (Staron, 2020). Since AI-assisted fashion design is still in its infancy, this study utilized exploratory operational action research which includes a series of steps of planning, acting, observing, and reflection. Midjourney was chosen as the tool for this study due to its acknowledged high-quality visual effects compared to other AI text-to-image tools (Jaruga-Rozdolska, 2022). Based on the literature regarding prompt engineering which refers to refining text inputs to achieve improved results (Oppenlaender, 2022), this study's acting process mainly involved three stages: inputting initial design ideas with

keywords, refining the input using keywords, images, parameters, and the variation function, and upscaling the outcomes. The whole process is iterative and spiral. To unleash the potential of the ideation process of fashion design that AI empowers, we investigated how to transfer a rough initial idea to a well-organized and detailed fashion design concept. Our design idea is to reveal modern females' confidence, talents, elegance, and rich life experiences. The initial themes and styles generated for the fashion design in the planning step include "Metamorphosis", female dress, iridescent fabric, structured bodice, and a skirt with billowing layers. Three satisfactory outcomes of this conceptual fashion design generated with Midjourney are presented in Figure 1.

Observations and Reflections In this study, the potential and limitations of the AI-powered tool Midjourney for fashion design were explored and examined. Through the evaluation of the creation process and digital image outcomes, it was found that artificial intelligence could be a valuable tool in facilitating the generation and development of fashion design concepts, with the potential to contribute significantly to the creative thinking process. One of the main advantages of using Midjourney is the ability to create high-quality and aesthetically pleasing digital fashion images, presenting many details, such as varying constructions, flat patterns, fabrics, and coloration, among others. Another advantage is the speed of creation, which is much faster than commonly used design software, thereby empowering designers to rapidly conduct digital experiments and explore different design directions. In addition, Midjourney exhibits human-like thought processes, allowing for a more intuitive inputting of keywords without needing to consider the specific sequence. It is worth noting that this AI-powered image generator provides certain valuable parameters that can not only translate images into textual information but also help designers maintain some degree of consistency among image outcomes.

Despite AI-powered image generation systems such as Midjourney have displayed apparent potential in facilitating fashion design, there are still some limitations. This AI tool needs the high-level involvement of users; for instance, the user needs to develop initial ideas and keywords, constantly analyze and evaluate outputs, and refine inputs to achieve desired results. Although Midjourney can generate high-quality and visually appealing digital images, to date, it mainly helps designers in the early stages of fashion design, particularly in the concept generation and development stages before physical prototyping and production. It is important to note that randomness exists in the creation process, as Midjourney randomly selects relevant images from the Internet or a predesignated image dataset as the basis to create variations in the outputs. Despite the presence of several existing constraints, it is believed that the AI-powered text-to-images tool is a promising and valuable way to facilitate and speed up the ideation process of fashion design that cannot be fulfilled with traditional fashion design.



Figure 1: Images generated with Midjourney

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