

Approaching generative adversarial network systems for design in fashion

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Motivation

Fashion design, as a digitalizing design discipline, sees a surge in digital tools that are increasingly relying on what is called generative adversarial network systems (GAN). As a specific branch within artificial intelligence technology, GAN systems provide an image or text-based output based on data they have been trained on (Liu, 2019; Masukawa, 2023). Design-specific software such as Adobe Photoshop sees iterative implementations of GAN systems into the list of offered features (Adobe, 2023), online GAN systems such as Stable Diffusion and Midjourney are used to generate images based on text input, and three-dimensional computer-aided design software such as Blender is given add-ons that integrate online GAN systems into their list of features (Weatherbed, 2023). While the development of GAN-based technology for design is moving on quickly, fashion designers have expressed that they do not feel prepared and well-informed about its potential use in existing design processes (Luce, 2018). Design education in fashion needs to address this by being more considerate of GAN systems, their use in design, their potential, and the challenges that they pose.

Scope

The workshop aimed to introduce fashion design students to generative adversarial network (GAN) systems for design processes in fashion. Three GAN systems were introduced and contextualized with respect to the increasing digitalization of the fashion design field. The participants were encouraged to work with the presented GAN systems during the design stages of ideation and digital prototyping in order to develop skills and knowledge about their potential for fashion design. The workshop concluded with a presentation of each participant, showcasing their designs and reflecting on the potential and challenges of GAN systems as tools for their design practice.

Outcome

The design outcomes that were presented by the participants at the end of the workshop as well as their engagement during group discussions throughout the workshop suggested that GAN systems could serve as design tools in fashion that might be useful specifically during the ideation phase. However, the presented outcomes and verbal feedback of the participants also suggested that GAN systems, while useful for visualizing ideas, cannot support the translation from sketches into three-dimensional prototypes at the current stage of technological development. Moreover, concerns were raised about authorship when using such tools as they are trained on existing work without clearly referencing it. More research is needed to draw out the usefulness of GAN systems beyond the ideation phase in fashion design processes, as well as how their use can be done in ethically more considerate ways by being more transparent about the authorship of reference data.

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Included Technology

Dall-E2, Stable Diffusion, Midjourney, Blender, CLO3D

References

Adobe (2023). Neural Filters overview. Accessed on the 21st of August 2023:
<https://helpx.adobe.com/photoshop/using/neural-filters.html>

Liu L., Zhang H., Ji Y., and Wu J. (2019). "Toward AI fashion design: An Attribute-GAN model for clothing match". In *Neurocomputing* (341). PP. 156-167

Luce L. (2018). *Artificial Intelligence for Fashion – How AI is Revolutionizing the Fashion Industry*. Apress publishing.

Masukawa R., Haji S., Takagi T., Matsui T., Ishikawa., Fuchi M. & Yamaji K. (2023). "Gan-based Detailed Clothing Generation System". In *Letters on Informatics and Interdisciplinary Research* (3). PP. 1-12

Weatherbed J. (2023). "Stable Diffusion AI art generator now has an official Blender plug-in". In *The Verge* online magazine. Accessed on the 21st of August 2023:
<https://www.theverge.com/2023/3/3/23623473/blender-stable-diffusion-ai-plugin-3d-modeling-texture-render>