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Human-AI Co-creation: Evaluating the Impact of Large-Scale Text-to-Image Generative Models on the Creative Process

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Abstract

Large-scale Text-to-image Generative Models (LTGMs) are a cutting-edge class of Artificial Intelligence (AI) algorithms specifically designed to generate images from natural language descriptions (prompts). These models have demonstrated impressive capabilities in creating high-quality images from a wide range of inputs, making them powerful tools for non-technical users to tap into their creativity. The field is advancing rapidly and we are witnessing the emergence of an increasing number of tools, such as DALL-E, MidJourney and StableDiffusion, that are leveraging LTGMs to support creative work across various domains. However, there is a lack of research on how the interaction with these tools might affect the users' creativity and their ability to control the generated outputs. In this paper, we investigate how the interaction with LTGMs-based tools might impact creativity by analyzing the feedback provided by groups of design students developing an architectural project with the help of LTGMs tools.

Keywords

- **Generative AI**
- **Creativity**
- **Human-AI**
- **AI-driven design process**

Notes

1. <https://stability.ai/blog/stable-diffusion-public-release>.
2. <https://nimblebox.ai/blog/stable-diffusion-ai>.
3. <https://www.grasshopper3d.com/>.
4. The author of the plugin started to develop and share the Toolkit in November 2022 and the current version is v1.1.6 (2023/02/06). The Main AI components are available from this GitHub page: <https://github.com/lucianoambrosini>.
5. The current version of the tool “LA_OpenAI-GHadv” is the build 111 and that one of the tool “LA_StabilityAI-GHadv” is the build 107.
6. This workshop focused only on text-to-image and image-to-image procedures, so all “masking” mode parameters have been skipped in this description.
7. The engines are different neural models that are developed by the use of a specific pre-trained set of images with different sizes. More info here: <https://stability.ai/blog/stable-diffusion-v2-release>.
8. Clip guidance mode (ClipG) works only with the “Ancestral Sampler” models, according to StabilityAI’s API documentation. Source, <https://platform.stability.ai/docs/getting-started/python-sdk>.

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