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Industrial Design and the Wizarding World of AI

How aligning semantics among designers helps them use AI tools more effectively

This graduation project explores the use cases of image-based AI in the industrial design process. Several tools were tested in collaboration with designers at Royal Gazelle leading to several key opportunities and limitations.

- Image-based AI can immensely speed up and broaden inspiration.
- Image-based AI lacks control when ideas become complex because designers cannot textually explain the image they want to create.

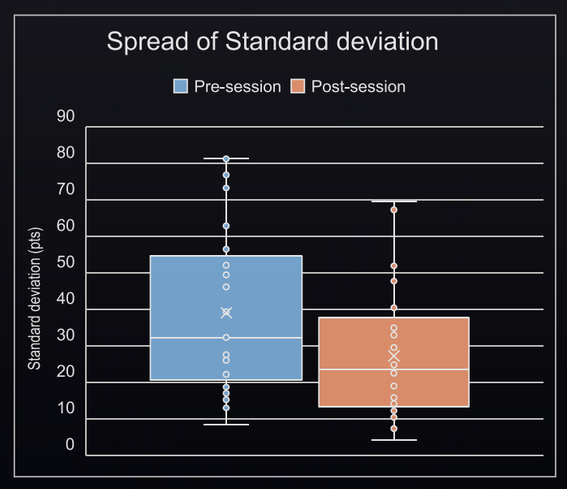
The lack of control stems from the lack of textual capabilities to capture visual detail and the misaligned semantics between designers and AI.

Designers use more nuance and domain-specific terminology to describe their vision, than AI models understand because AI models are trained on generic image-text datasets. Additionally, designers perceive and articulate their perception similarly, therefore an image-text dataset can never naturally match everyone's vibe.

To align the vibe between designers and between designers and AI, a design team did a co-creative image labelling session for a low-rank adaptation model (LoRA), a small AI model that functions within a bigger one. Collectively labelling a dataset forces the designers in the team to align their perception and articulation of perception before training the model. During the session, participants started focussing on more of the same features and used similar vocabulary to describe them.

The participants ranked 25 form study images between "fragile" and "powerful" to validate the alignment of perception before and after the session. The average standard deviation per image dropped by 30.8% when comparing the post- to pre-session rankings.

Additionally, the generated output aligned better with the designer's expectations, hence self-trained LoRA models show potential to externalise tacit design knowledge.



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