From Sketch to Reality

A Collaborative Approach to Design and Generative AI in Fashion

Research Questions

1. How can AI technologies, such as Stable Diffusion combined with ControlNet and inpainting techniques, be leveraged to enhance the creative processes and workflows of independent designers while preserving their distinct styles and artistic visions?

2. In what ways can the integration of AI architectures into the design process help small designers and clients make more sustainable choices by reducing the need for physical prototypes, thus minimising waste in the production process?

3. Is the use of small and ethically sourced data a viable approach for fostering creative collaboration between AI developers and fashion designers, particularly in the production of bespoke, individual fashion projects?

Designer Sketches

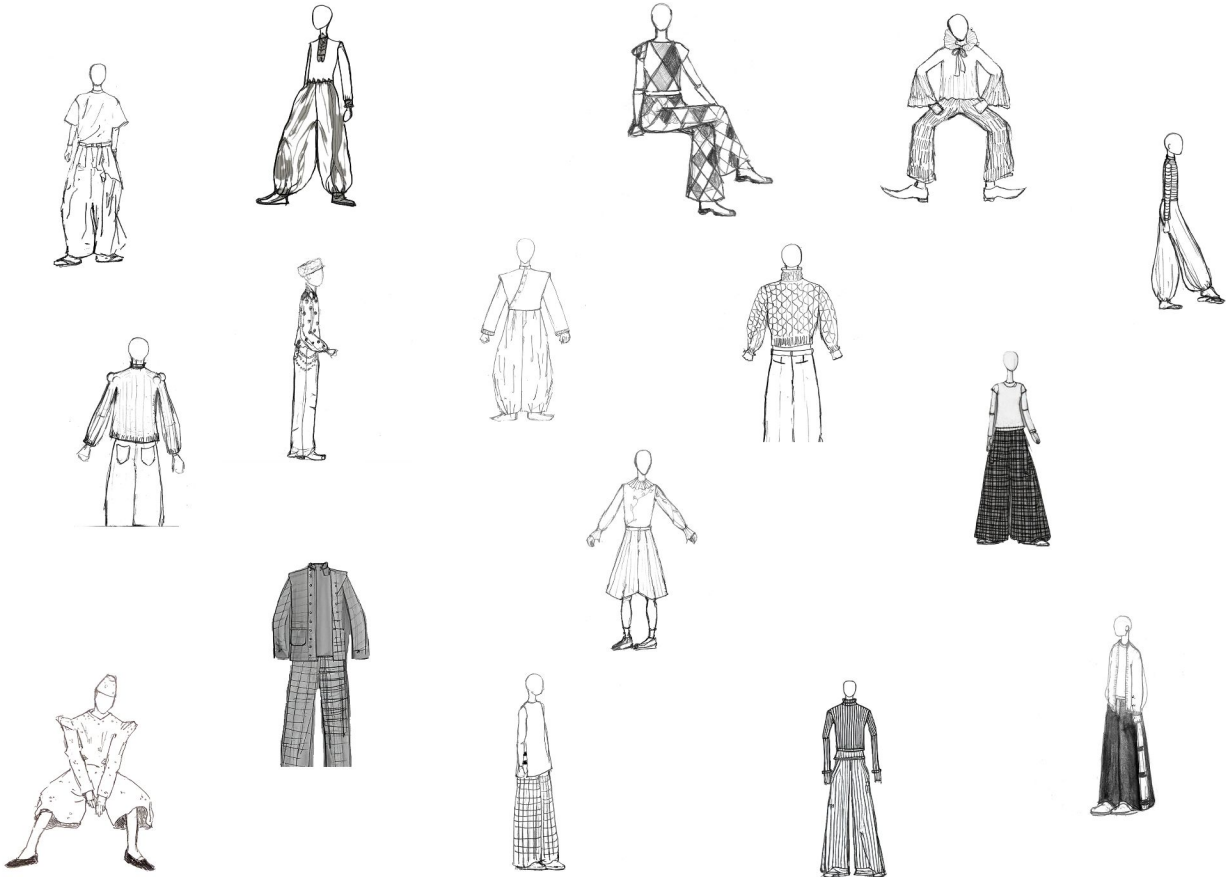
Generative Sketches

Fine-tuned using stable-diffusion-2

learning_rate = 1e-6
batch_size = 4
gradient_accumulation = 2

A Quote from the Designer About the Sketches

“The AI-generated sketches are impressive and closely mirror my style. It captured the way I sketch bodies, the proportions I typically use for my mannequins, and even the details of how I draw patterns on clothing. Seeing these sketches was special—it allowed me to step back and view my work with a fresh perspective. Despite the distance, I can still clearly recognize my own style in them, which made me appreciate my work even more. I'm thrilled that you’ve essentially created a "sketchbot" that replicates my personal artistic touch.”



All Sketches Used for Photorealistic Rendering



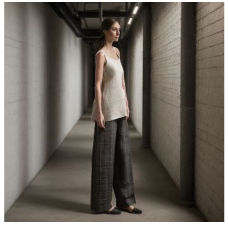










ControlNet (realistic-vision-v51; not fine-tuned)

Fine-tuned using realistic-vision-v51

learning_rate =5e-7, batch_size = 3, gradient_accumulation = 2

Backdrop Images

Before



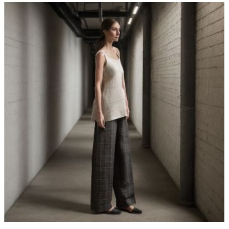






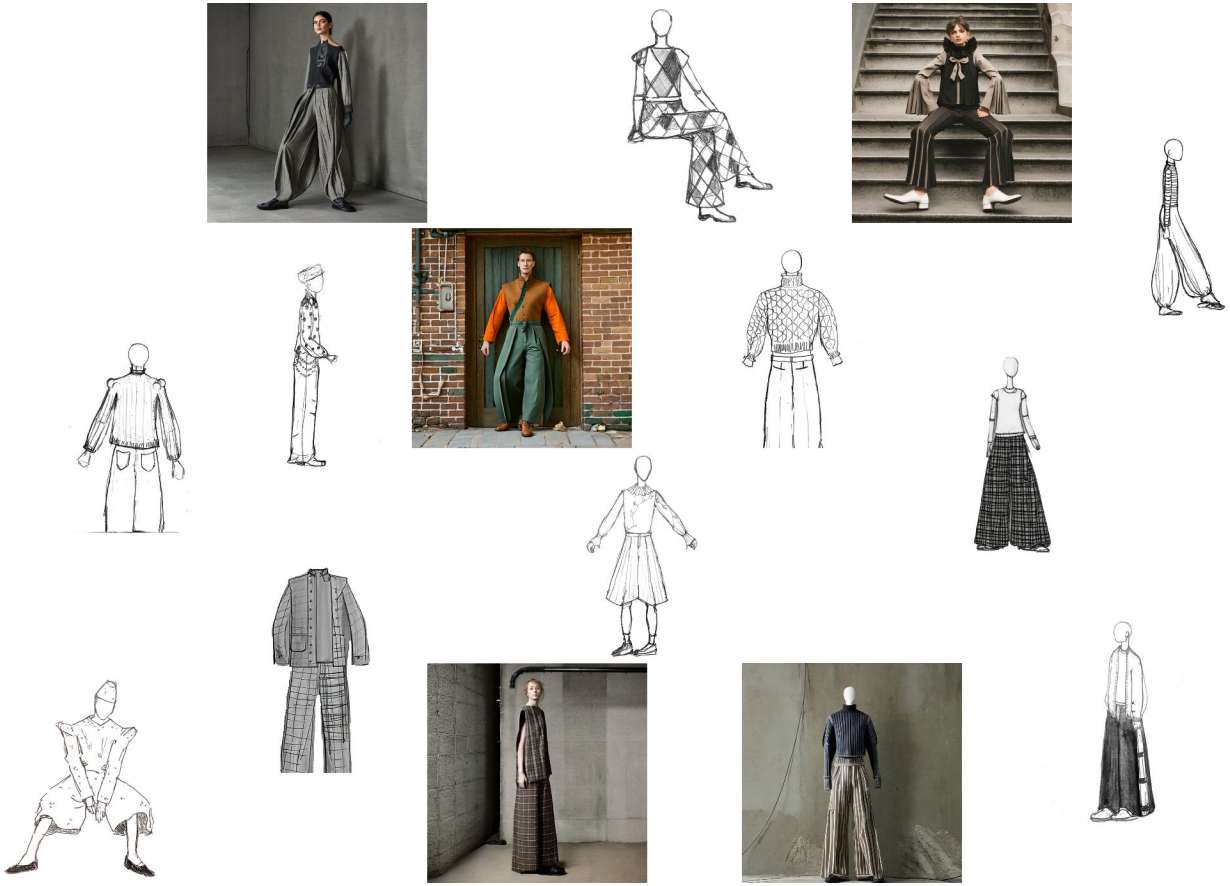




ControlNet (realistic-vision-v51; not fine-tuned)

After



Realistic-vision-v51 vs. fine-tuned output - direct comparison

Model Outputs for Fine-Tuned Backdrops

Captioned vs. Uncaptioned Data

designer sketch

realistic-vision-v51

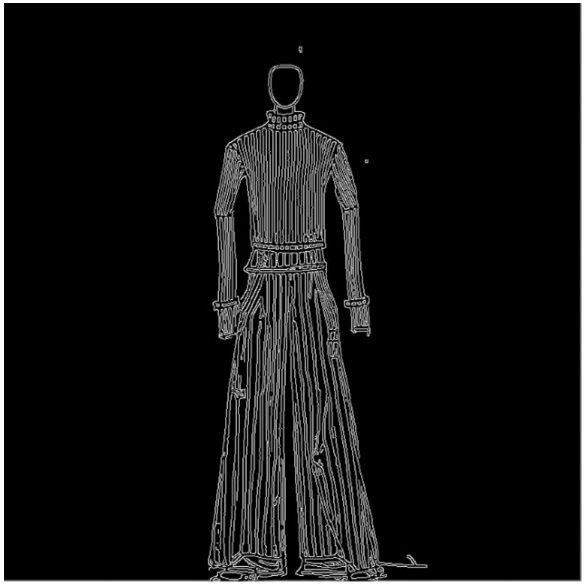
captioned fine-tuning

uncaptioned fine-tuning

A Quote from the Designer About the Backdrops

"Typically, in fashion shoots and visualisations, it's important to keep the background quite subtle to emphasise the garments themselves... with the right balance of adding character, depth and a more avant-garde aesthetic, the backdrop fine-tuning can be really handy for marketing fashion in a more interesting and emotionally rich way."

ControlNet Scribble & Canny



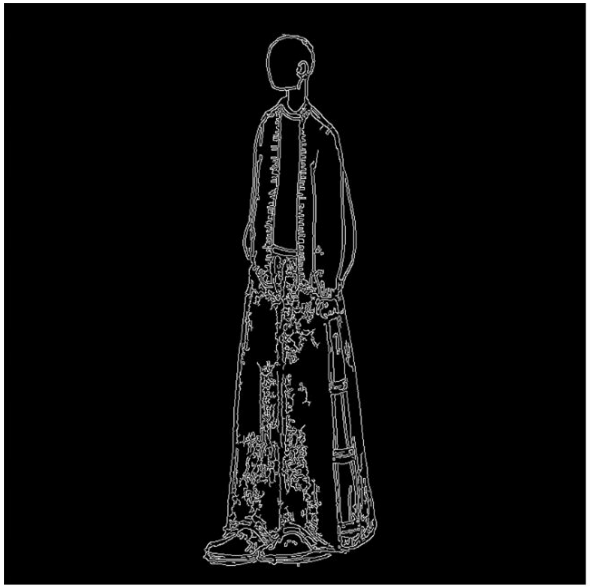
generated sketch
(fine-tuned on designer's sketches)

ControlNet Scribble

guidance_scale = 7
Control conditioning sale = 1.0

ControlNet Canny

guidance_scale = 7
Control conditioning sale = 0.7



designer sketch

ControlNet Canny

guidance_scale = 7
Control conditioning sale = 0.7

ControlNet Scribble

guidance_scale = 6
Control conditioning sale = 1.0

Negative Prompts

generated sketch

without negative prompt

with negative prompt

Negative prompt: “leather trousers”

Negative Prompts

Negative prompt: “polka-dotted background, polka-dotted hat, red shoes”

designer sketch

without negative prompt

without negative prompt

with negative prompts

Final Outcomes




Technical Challenges Throughout the Research

⚙️ Adjusting hyperparameters for fine-tuning (e.g., learning rate, batch size, gradient accumulation)

⚖️ Balancing the control conditioning scales – there were differences between ControlNet Canny and ControlNet Scribble

🗨️ Using prompts and negative prompts effectively

Closing Thoughts

✅ AI as a collaborative tool for fashion

✅ Ethical data practices

✅ Inclusivity & sustainability in design

❌ AI as a replacement for artisanal expertise

🌱 Get various designers & styles involved to check generalisability of the research

🌱 Explore control mechanisms further to maintain artistic visions

“It should be a collaborative process where both parties respect each other's expertise.”