



From small-scale generative images to global picture of HCI

Jonas Oppenlaender, Postdoctoral Researcher
University of Oulu, Finland

MBZUAI Research Talk, Nov 2025



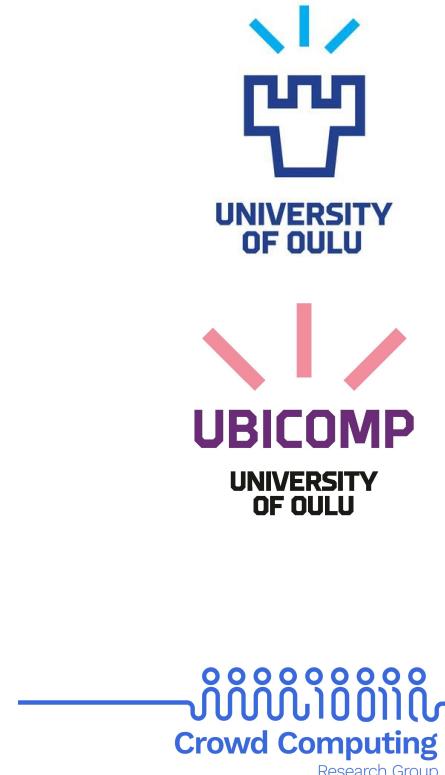
prompt: "elongated surreal synchronized elonga

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Generative AI, Creativity, and “Meta-HCI”

Ph.D. (2021), Human–Computer
Interaction, University of Oulu

M.Sc., (2015) Computer Science,
University of Southampton



2018–2021

Creative Crowdsourcing / Creativity Support Systems



Workers

A screenshot of the Amazon Mechanical Turk interface. The top navigation bar includes 'Dashboard', 'Qualifications', and 'Search for HITs'. The main area shows a list of HITs with columns for 'Header', 'Title', 'Description', 'Bids', 'Status', and 'Actions'. The list includes various tasks such as 'Evaluate image tags (MEDIUM)', 'Find Additional Contact Information', 'Collect Data from Household', 'Find the name of CTO or other terms in the file in a plain text document', '1 minute survey - service preference', and 'Research Original Setting Pricing (Pilot) for Designer Items'. The status column indicates tasks like 'Accepted A Task' and 'Pending'.

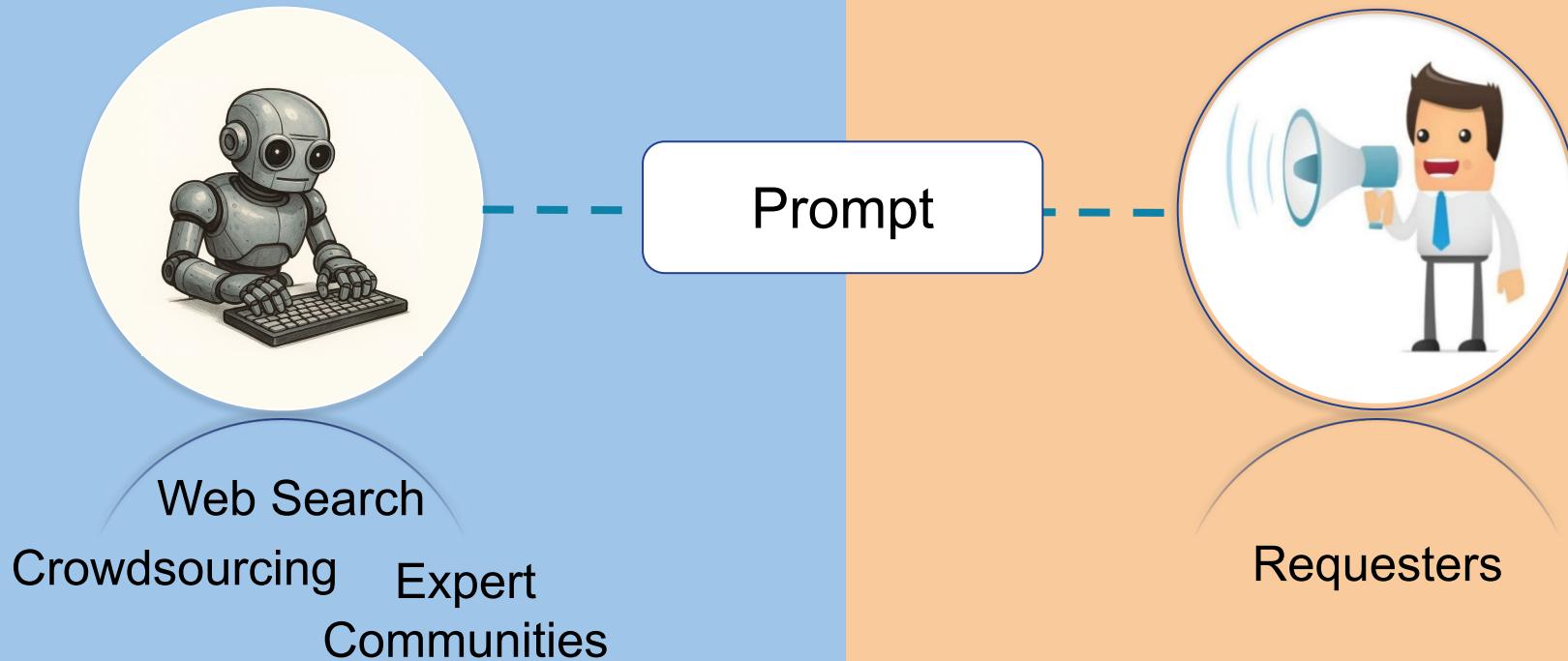
Crowdsourcing
Platform
(e.g., Amazon
Mechanical Turk, Prolific)



Requesters

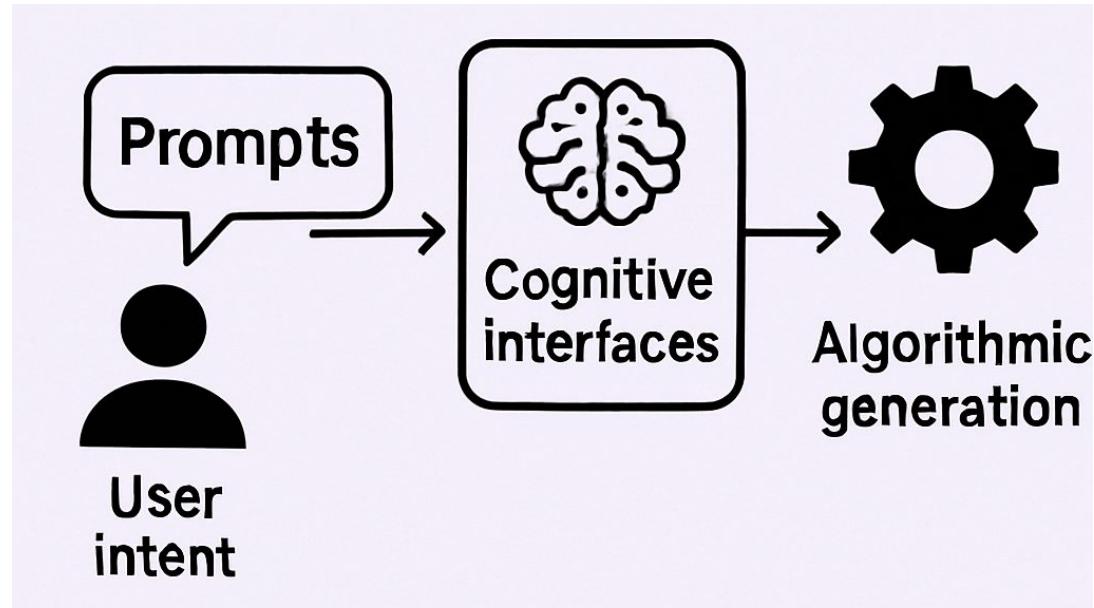
2022-

Generative Artificial Intelligence



Prompts as mediators of intent

“Prompts function as cognitive interfaces that mediate between user intent and algorithmic generation”
(Daalsgard 2025)



2022-

“Prompt Engineering” as a Paradigm Shift

From: Human-Computer Interaction
To: Human-AI Interaction

Experiments with
VQGAN-CLIP



2021

Midjourney
1st-wave Betatester



2022

Understanding Prompting as an End-User Interface

(in TTI generation)

Creativity

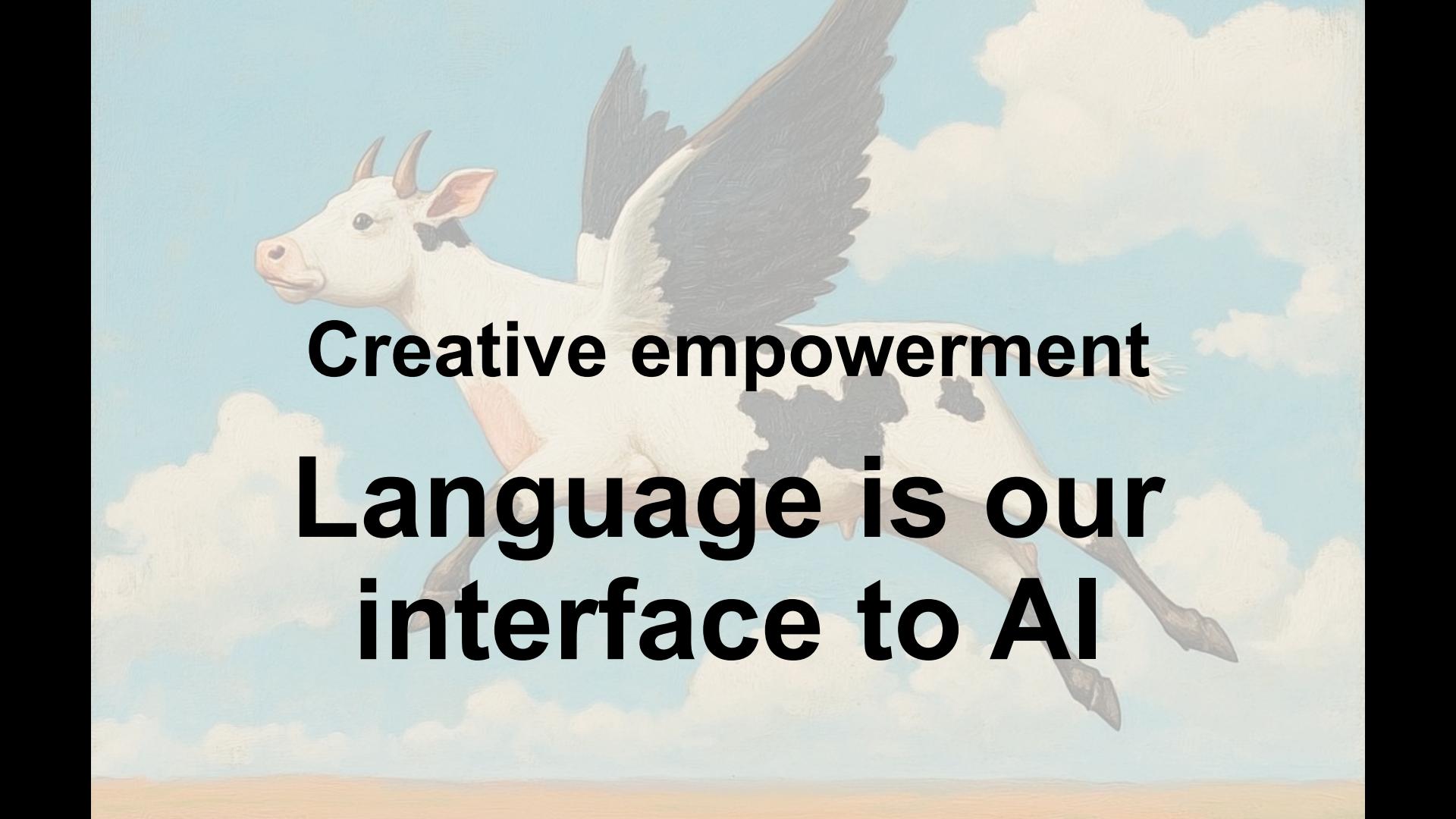
Misalignment

Understanding Prompting as an End-User Interface

(in TTI generation)

Creativity

Misalignment



Creative empowerment

**Language is our
interface to AI**



Creative empowerment?

Language is our

imperfect interface to AI

Creativity

What does it mean to be creative with text-to-image generation?

image generated with Midjourney



prompt: "creativity"



Prompt Engineering

Prompt Design

- Labor-intensive
- Iterative human effort
- Specialized expertise
- Lack of standards

“while some prompts resemble natural language, many of the most ‘successful’ prompts do not”

Meredith Ringel Morris (2024): Prompting Considered Harmful. Communications of the ACM.
<https://doi.org/10.1145/3673861>



Prompt Engineering

Taxonomy of Prompt Modifiers for TTI Generation

- **Style modifiers**
 - concept art, oil painting, photorealistic, ...
- **Quality Boosters**
 - high quality, 8k, highly detailed, artstation, ...
- **Repeating terms**
 - spacewhale, a whale in space
- **Magic terms**
 - feel the sound
- **Image prompts**



propaganda poster end digital concept angel octan
pixar Seb McKinnon night plant head brain glowing
Peter Mohrbacher 8k hd beautiful painting look st
hell rendered realistic materials whimsically designed
detailed mattesubsurface scattering 0 4 middle eye
art nouveau demon beautiful ocean yellow gold
character concept space logo sun New York
painting portrait orange mar nature waterco
concept art large mirror cat
green dream god Moebius cute
post processing child white re
concept render Shaun Tan robot
Dan Mumford hyperrealistic photo
huge sky Tony Soprano forest octane 8k
unreal engine pattern plushie chibi
mullin flying fighting house universe earth

The photograph, taken with a Canon EOS and a SIGMA Art Lens 35mm F1.4, is a masterclass in photographic precision, with ISO 200 and a shutter speed of 2000 ensuring every detail is flawlessly rendered.

A completely unrealistic glowing animal sitting on a branch in the forest.

```
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```

Prompt Engineering Prompt Example



User @milkytaste, 2024

Creativity

The 4P of Text-to-Image Generation

Practitioner

Digital image;
prompt

Choice of prompt

Iterative prompt
optimization; editing; tools

Adaption of prompts and
modifiers from other
creators

(Rhodes' 4P of Creativity)

Product:

artifacts = observable
outcome (e.g., poem,
painting, sculpture)

Person:

personality, intellect, habits,
attitudes, ...

Process:

thinking, motivation,
learning, ...

Press:

environment of the creative
individual

Viewer

Digital image;
prompt (only if shared)

n/a

n/a

n/a

Creativity

“Standard” Definition of Creativity

Criteria 1:

Novelty

Criteria 2:

Usefulness / Apropriateness / Value

Runco and Jaeger (2012): The Standard Definition of Creativity.
Creativity Research Journal, 24(1), 92-96, Taylor & Francis.
<https://doi.org/10.1080/10400419.2012.650092>



Prompt: “elongated surreal synchronized elongated legs” 16

Edge Case 1: Non-creative image generation?

- (1) Music lyrics
- (2) Random snippets of text
- (3) Single characters & emojis

Edge Case 2: Innovative image generation?

Highly creative practitioners seek to innovate by writing novel prompts that deviate from past prompts

Prompt: "invalid cell in the valid world"



Creativity

Image Generation Experiments

→ Mode Collapse



Creativity

Mode Collapse on Midjourney

Tagalog



(child)

(fire)



bata

seed 123456 v 6.1 stylize 0



apoy

seed 123456 v 6.1 stylize 0

Creativity

Default Image Prompts

Unique Names: *Nuoka Zuberi, Shelan Creswell, Soraya Lonescu, ...*

URLs: www.amazon.com,
www.bing.com, www.chatgpt.com, ...

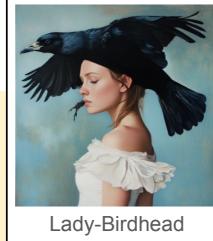
Finnish: *maito, kinkku, suola, ...*

Tagalog: *apoy, bata, pagpag, ...*

Glitch Tokens: *Rawdownload, PsyNetMessage, ...*

Corrupted Words: *Greagoft, Shuttastfr, Shuttagolt, ...*

Abbreviations: *bcd, gsod, dqae, ...*



Lady-Birdhead



Floating-Head



Psychedelic-Eye



Growth-Face



Animal-Bush



Eagle-Circle



Standing-Lady



Fantasy-Castle



Mirror-Lady



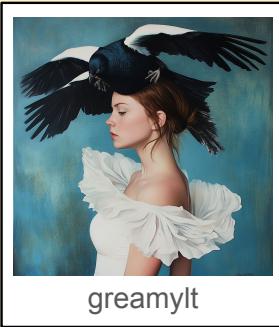
Headpiece-Lady

Creativity

Lady Birdhead



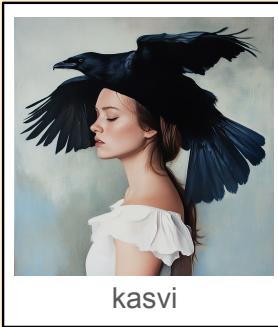
bcd



greamylt



greawarz



kasvi



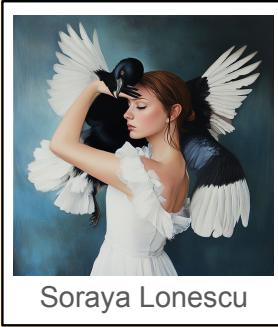
kinkku



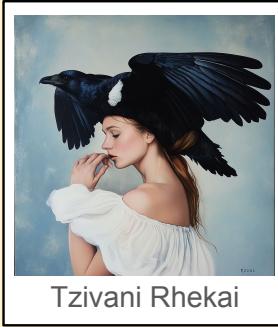
suola



Shelan Creswell



Soraya Lonescu



Tzivani Rhekai

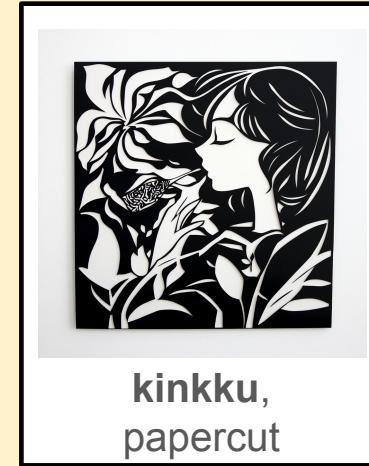
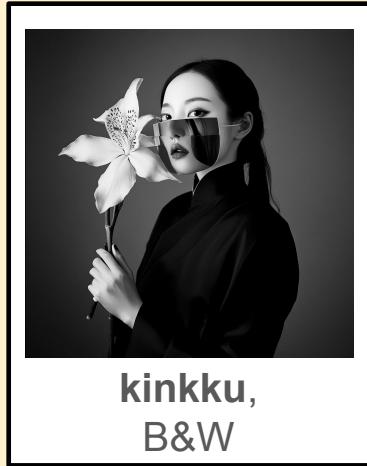
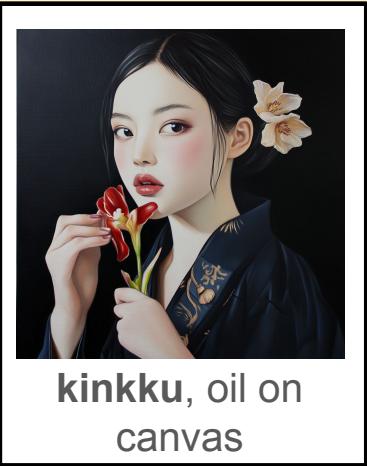


www.tumblr.com

Hannu Simonen, Atte Kiviniemi, Hannah Johnston, Helena Barranha, and Jonas Oppenlaender (2025):
An Exploration of Default Images in Text-to-Image Generation. <https://arxiv.org/abs/2505.09166>

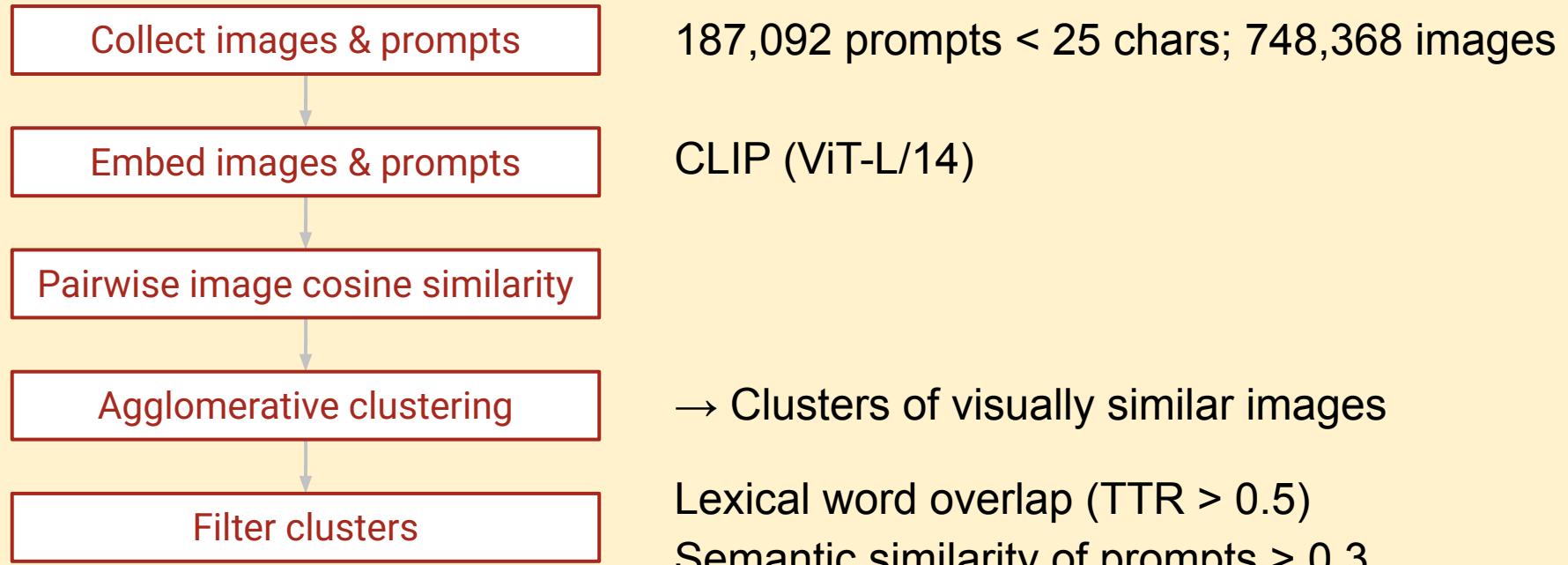
Creativity

Default image concepts behave like normal concepts



Creativity

Identifying Default Images on Midjourney

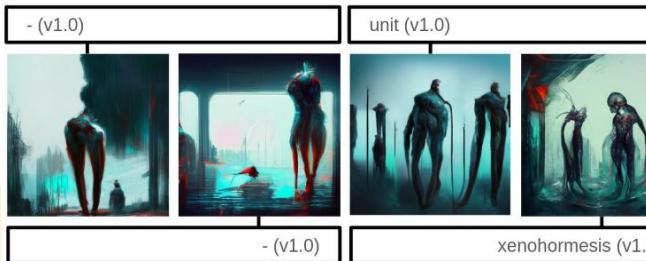


Creativity

Identifying Default Images on Midjourney

Result:

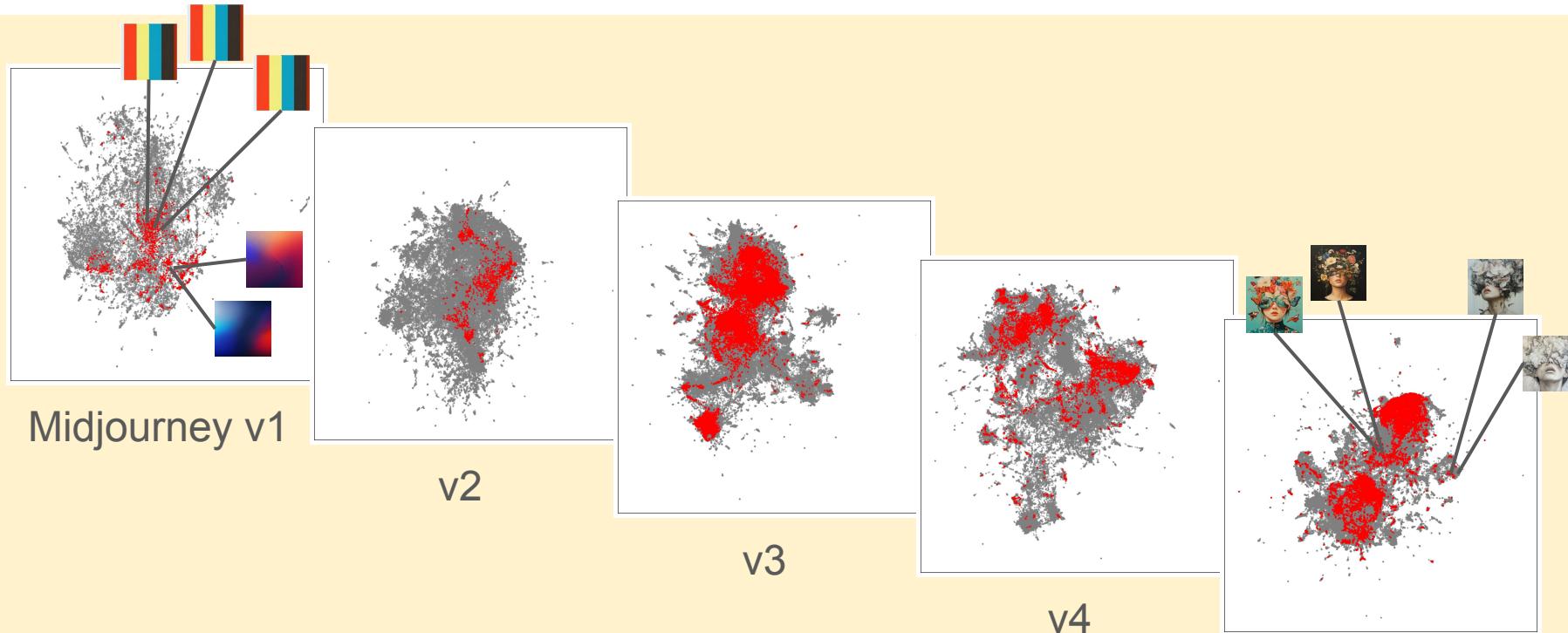
4.8% potential
default images



Hannu Simonen, Atte Kiviniemi, Hannah Johnston, Helena Barranha, and Jonas Oppenlaender (2025):
An Exploration of Default Images in Text-to-Image Generation. <https://arxiv.org/abs/2505.09166>

Creativity

Identifying Default Images on Midjourney



Hannu Simonen, Atte Kiviniemi, Hannah Johnston, Helena Barranha, and Jonas Oppenlaender (2025):
An Exploration of Default Images in Text-to-Image Generation. <https://arxiv.org/abs/2505.09166>

Creativity

Innovative Image Generation?

- Highly creative practitioners are “punished” with default images
- Default images can stop, but also derail the creative process
- Frustration, a sense of lost control over the creative process
- Undermines user trust, agency, perceived accuracy and, usability



prompt: “*modernika*”

Social Creativity

Challenges of Text-to-Image Generation in Public Spaces

C1: Individual use

C2: Limited control

C3: Language barrier

C4: Low engagement

European Researchers' Night • Forskarnatten



Social Creativity

“Bodyprompting”

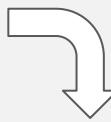
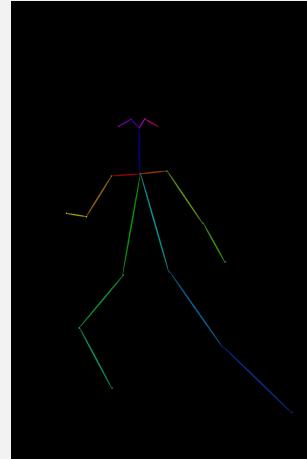
Source artwork



User



Pose

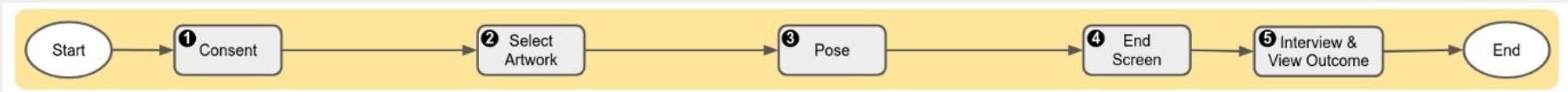


Output



Jonas Oppenlaender, Hannah Johnston, Johanna Silvennoinen, and Helena Barranha (2025): Artworks Reimagined: Exploring Human-AI Co-Creation through Body Prompting. In Proc. ACM Hum.-Comput. Interact. (PACM-EICS). <https://dx.doi.org/10.1145/3734189>

Study Procedure

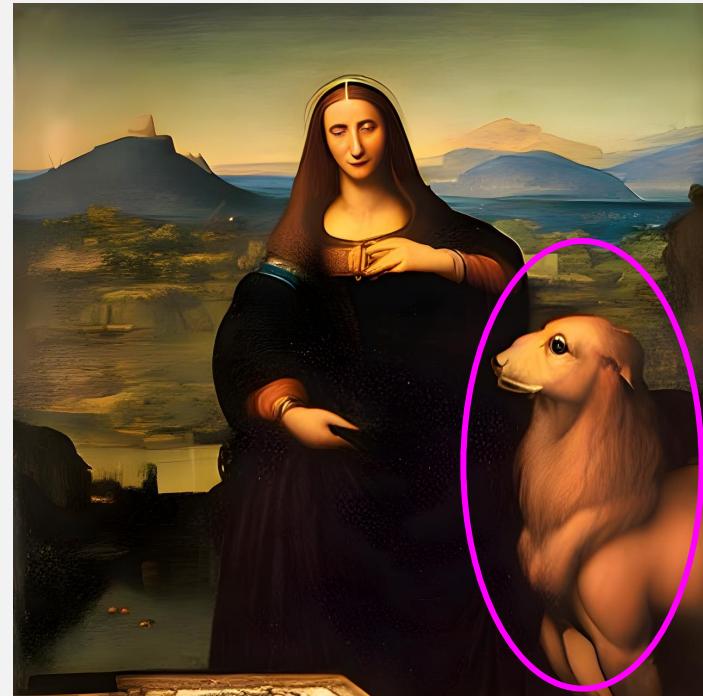
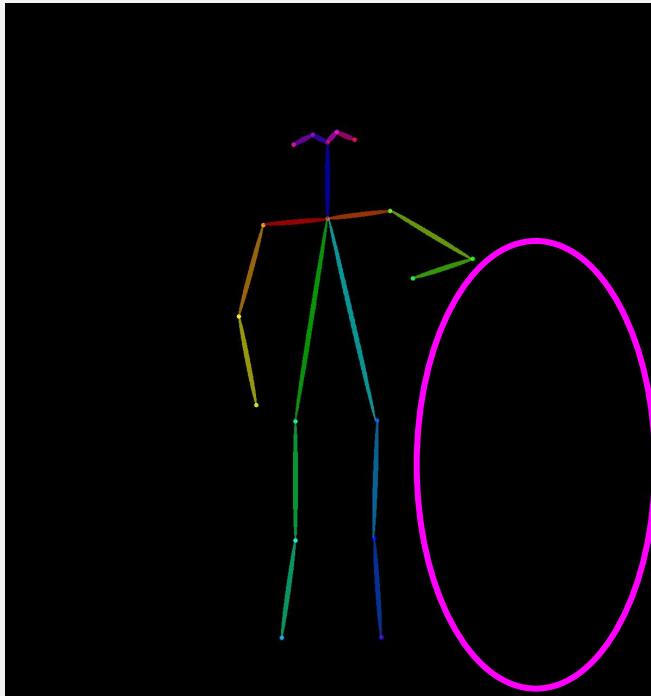


172 images; 6 hours; 79 interviews (~37 years, max 68 years)

44 group images (56%), 35 individual participants (44%)

Engaging & “fun” experience

AI Hallucinations



AI Hallucinations

Location of change	Narrative change	Hallucination	Frequency	Description	Example

Understanding Prompting as an End-User Interface

(in TTI generation)

Creativity

Misalignment

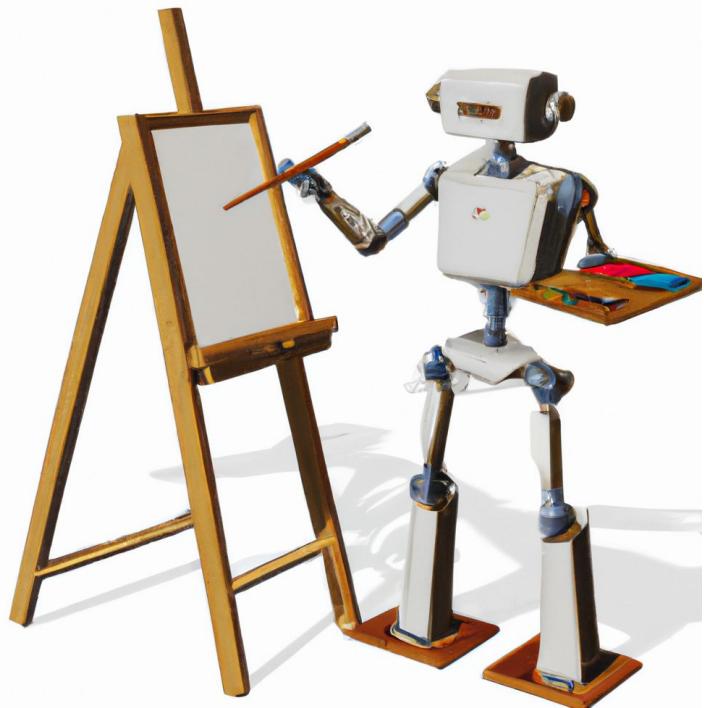
**“Prompt engineering”
as a symptom
of misalignment**

Misalignment

Randomness of first generated image

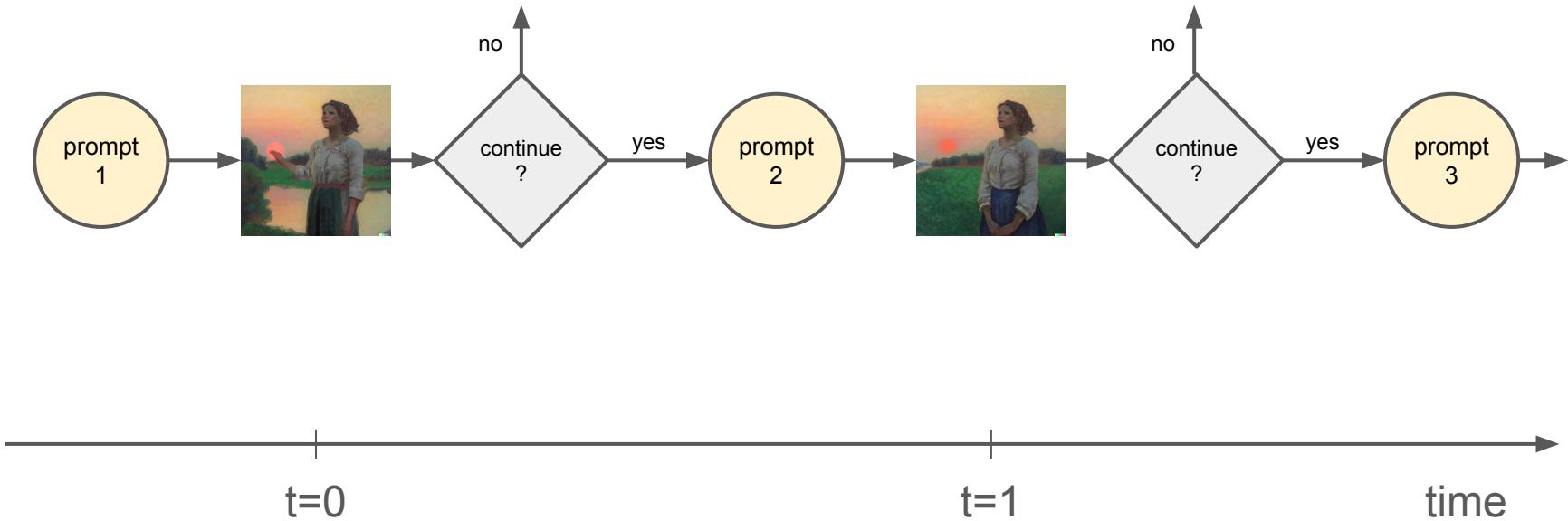


prompt: “April 23, 1986”



Misalignment

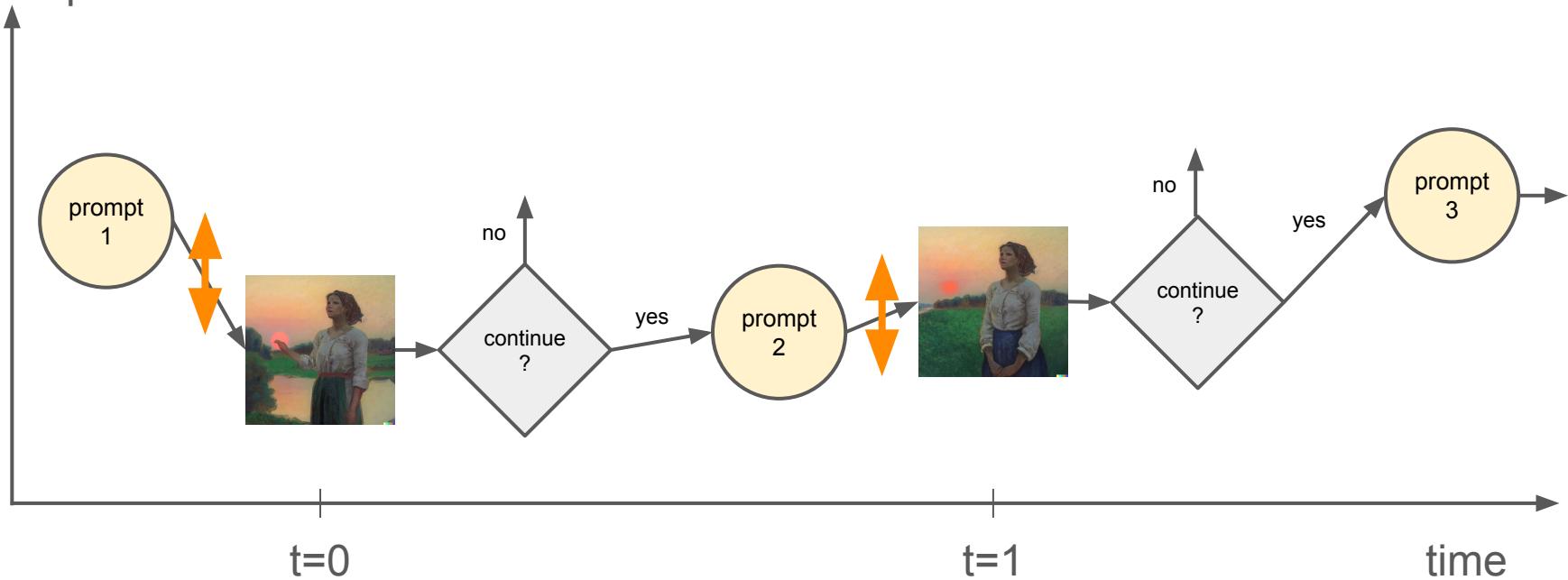
The Creative Process with Generative AI



Misalignment

The Creative Process with Generative AI

User's
Expectation



Misalignment

The Creative Process with LLMs

The Impact of Generative AI on Critical Thinking: Self-Reported Reductions in Cognitive Effort and Confidence Effects From a Survey of Knowledge Workers

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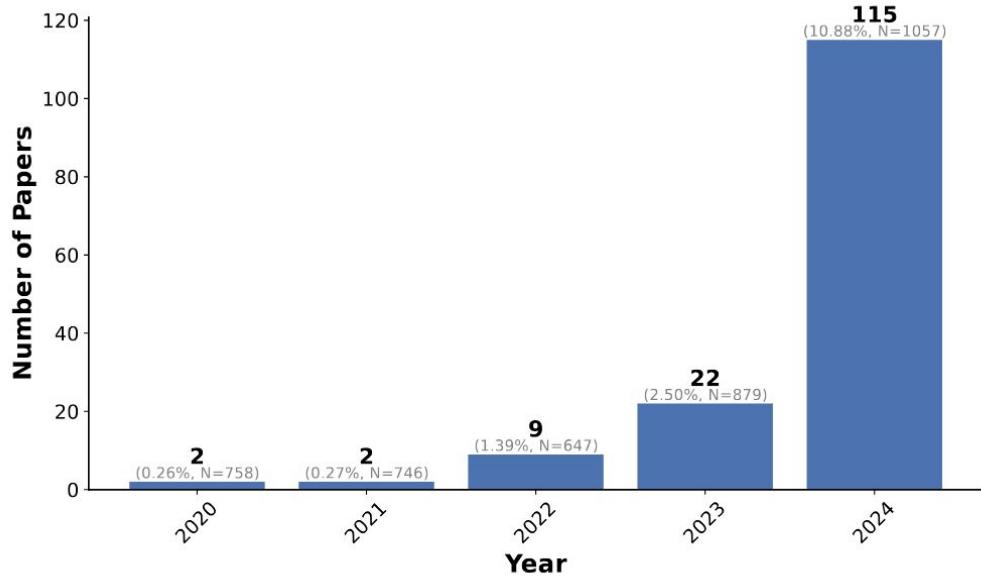
Prompting in HCl

AI no longer
middleware;
Application phase:
we interact directly
with AI



Transformative Effect of LLMs

“LLM-ification” of HCI Research / NLP / Software Engineering / ...



Pang et al. (2025): Understanding the LLM-ification of CHI: Unpacking the Impact of LLMs at CHI through a Systematic Literature Review. In Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25). ACM, New York, NY. <https://doi.org/10.1145/3706598.3713726>

Front. Comput. Sci., 2025, 00: 1–35
https://doi.org/10.1007/sxxxxx-yyy-zzzz-1

RESEARCH ARTICLE

Large Language Models Meet NLP: A Survey

Libo Qin¹, Qiguang Chen², Xiachong Feng³, Yang Wu², Yongheng Zhang¹, Yinghui Li⁴, Min Li¹, Wanxiang Che()², Philip S. Yu⁵

frontiers | Frontiers in Artificial Intelligence

TYPE Specialty
PUBLISHED: 12 January 2024
DOI: 10.3389/frai

Natural language processing in the era of large language models

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School of Electronic Engineering and Computer Science, Queen Mary University of London, United Kingdom

KEYWORDS

natural language processing, large language models (LLM), language model, specialty grand challenge, generative AI

1 Overview

Since their inception in the 1980s, language models (LMs) have been around for four decades as a means for statistically modeling the properties observed in language (Rosenfeld, 2000). Given a collection of texts as input, a language model captures statistical properties of language from those texts, such as frequencies and probabilities of words and surrounding context, which can then be used for different purposes, such as natural language understanding (NLU), generation (NLG), reasoning (NLR), broad-based processing (NLP) (Dong et al., 2019). Such statistical approach to modeling language has sparked debate for decades between those who argue that language is modeled through the observation and probabilistic representation of patterns, and those who argue that such an approach is rudimentary and that proper understanding requires a more sophisticated, rule-based approach.

Transformative Effect of LLMs

Milestones in HCI

We risk tool-driven novelty at the expense of conceptual progress and meaningful insight

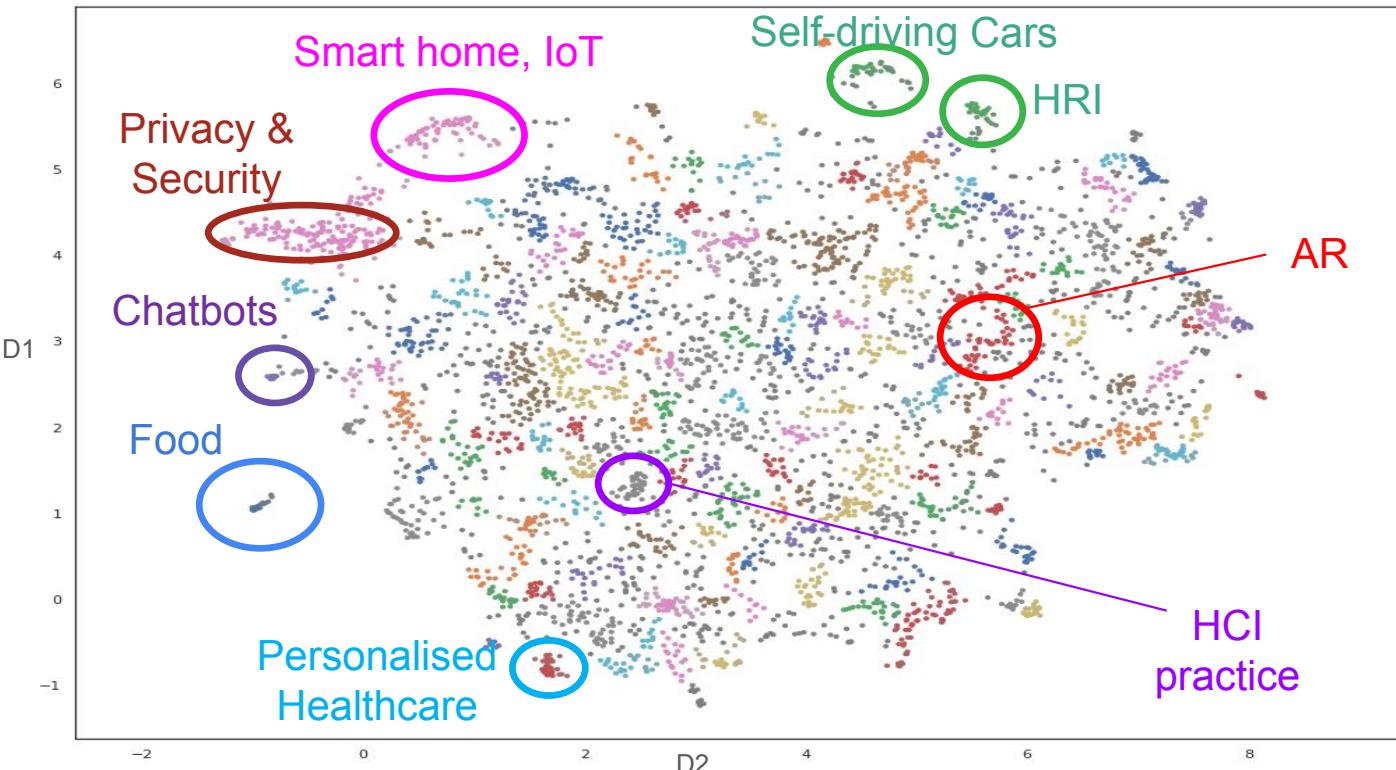
- HCI milestones are often methods & frameworks that open new ways of thinking and move the field forward
- Impact of LLM prototypes?



Jonas Oppenlaender and Simo Hosio (2025): Keeping Score: A Quantitative Analysis of How the CHI Community Appreciates Its Milestones. In Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25). ACM, New York, NY.
<https://doi.org/10.1145/3706598.3713464>

Key issue

Little (Self-)Reflection in HCI research on a Meta-level

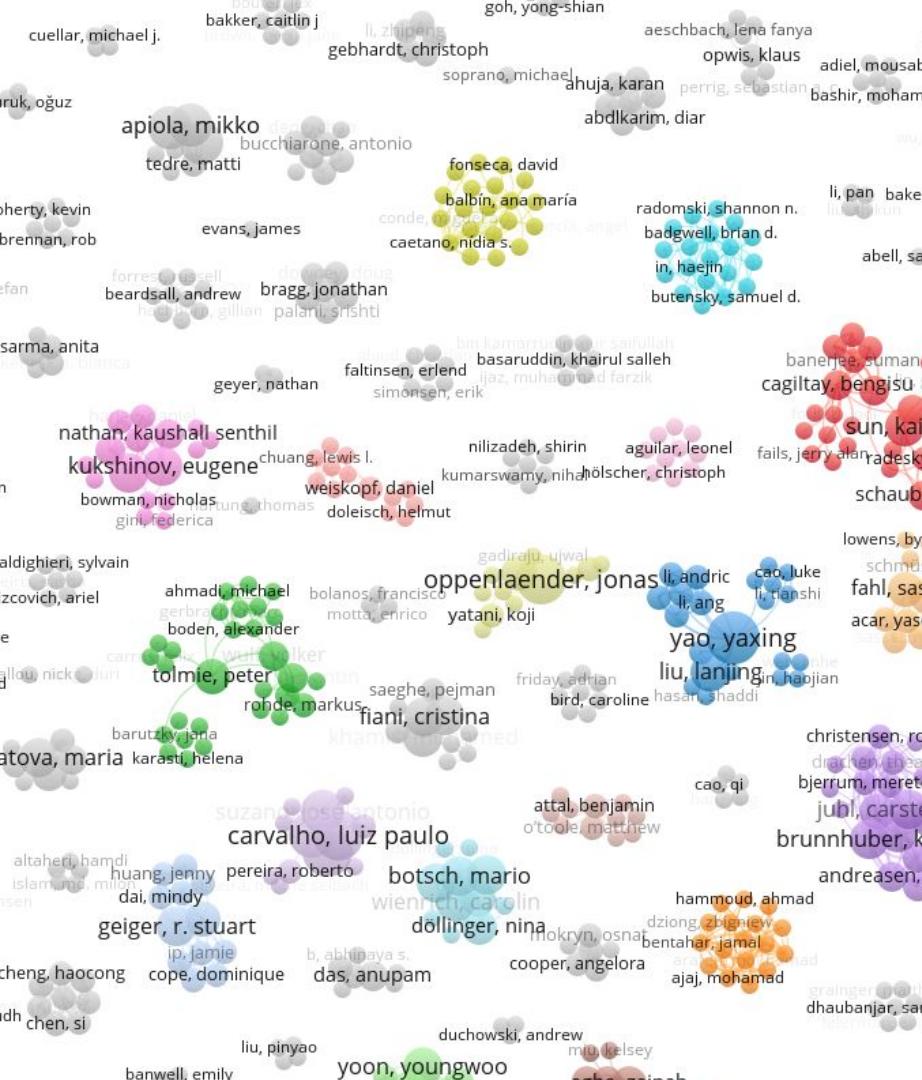


Research challenges in CHI '23 articles

Jonas Oppenlaender and Joonas Hämäläinen (2023): Mapping the challenges of HCI: An application and evaluation of ChatGPT for mining insights at scale. <https://arxiv.org/abs/2306.05036>

META-RESEARCH in HCI

today



META-RESEARCH

in HCI

today



META-RESEARCH

in HCI

future

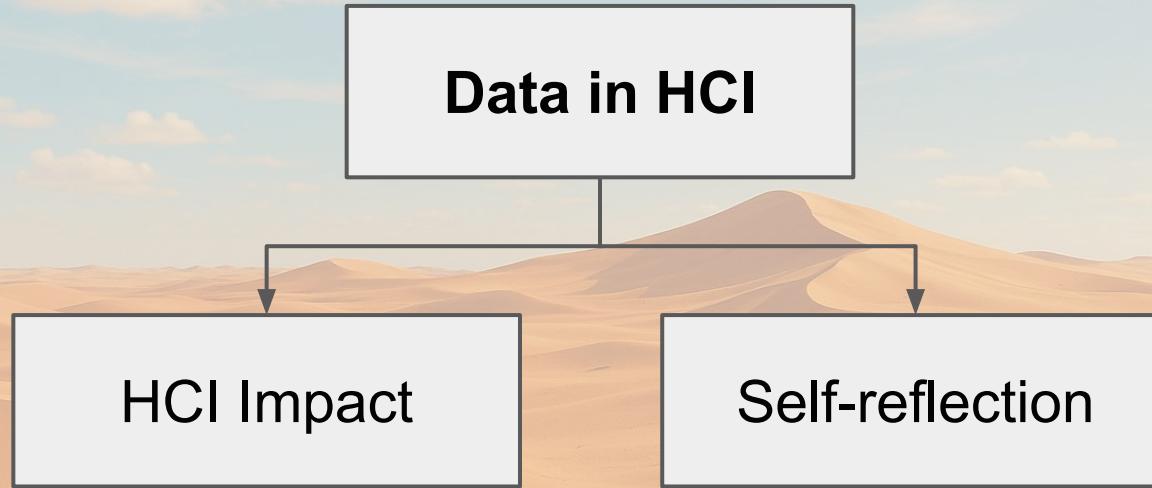


Meta-
models

Metrics

Tools

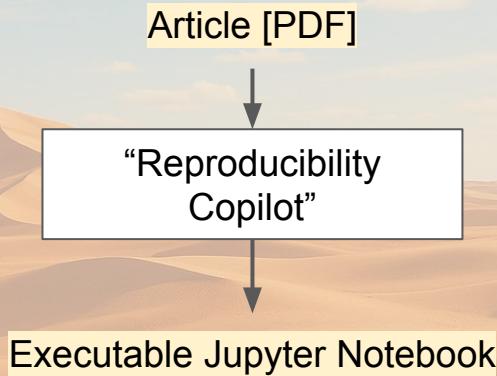
Solution



Shared Data Platform

The screenshot shows the alphaXiv website interface. At the top, there's a header with the alphaXiv logo and handle (@askalphaxiv). Below the header, a message states: "We used DeepSeek OCR to extract every dataset from tables/charts across 500k+ AI arXiv papers for \$1000 🚀". Another message below it says: "See which benchmarks are trending and discover datasets you didn't know existed". A third message at the bottom says: "Doing the same task with Mistral OCR would've cost \$7500 💯". The main content area displays a grid of dataset cards. Each card includes the dataset name, author(s), date, and a brief description. Examples shown include Puffin-4M, Adaptive LLM Attack Benchmark, KORMo, SpaceVista, Math-VR, and DeepMMSearchVQA. The bottom of the page shows the timestamp "10:46 PM · Oct 21, 2025 · 269K Views".

“Actionable” Data



<https://x.com/askalphxiv/status/1980722479405678593>

Zhang et al. (2025): aiXiv: A Next-Generation Open Access Ecosystem for Scientific Discovery Generated by AI Scientists.
<https://arxiv.org/abs/2508.15126>

Bibal et al. (2025): AI Copilots for Reproducibility in Science: A Case Study. <https://arxiv.org/abs/2506.20130>

Generative Agents: Interactive Simulacra of Human Behavior

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Figure 1: Generative agents are believable simulacra of human behavior for interactive applications. In this work, we demonstrate generative agents by populating a sandbox environment, reminiscent of The Sims, with twenty-five agents. Users can observe and intervene as agents plan their days, share news, form relationships, and coordinate group activities.

Park et al. (2023): Generative Agents: Interactive Simulacra of Human Behavior. In Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology (UIST '23). ACM, New York, NY. <https://doi.org/10.1145/3586183.3606763>

Simulating the Human in HCD with ChatGPT Redesigning Interaction Design with AI

● Albrecht Schmidt, LMU Munich,
Passant Elagroudy, German Research Center for Artificial Intelligence,
Fiona Draxler, LMU Munich, Frauke Kreuter, LMU Munich,
Robin Welsch, Aalto University

Insights

- Generative AI can enhance the human-centered design process.
- LLMs encode human experiences and can be used to emulate users at a large scale.
- Use of generative AI must be made transparent in human-centered design.
- Generative AI will not replace user studies but rather will enhance the toolkit of HCI researchers and practitioners.

IMAGE BY BEAST01 / SHUTTERSTOCK.COM

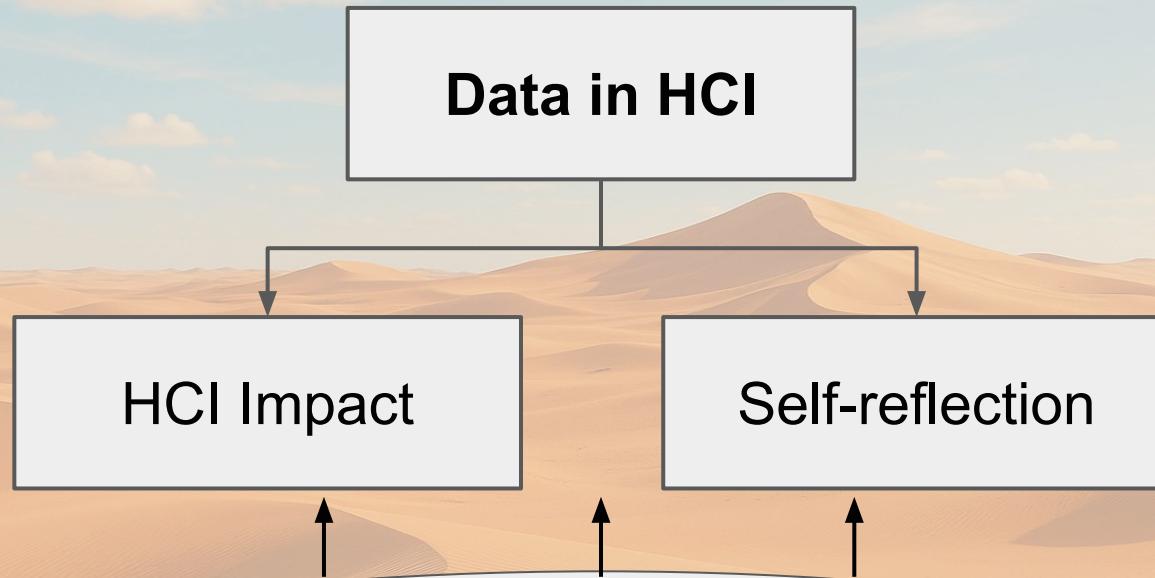
INTERACTIONS.ACM.ORG

Human-centered design (HCD) puts the human at the center of interactive system design. Can we do that without actively including the human user in the process? Is that still HCD? We believe that large language models (LLMs) and generative AI will fundamentally change the way we design and implement interactive systems. Models are not new to HCI, but the scale at which LLMs can support the design process is potentially speed up that process. Creating models, however, has been difficult and cumbersome, which is why human-centered design, which involves people in the process, has been the most common approach to creating usable systems. Putting the

There are attempts to model human physiology as well as cognitive processes, and there is an entire journal (<https://www.springer.com/journal/11257>) and conference (UMAP; <https://www.um.org/umap2023/>) devoted to user modeling. Models are helpful since they do not require the user during the design process and thus potentially speed up that process. Creating models, however, has been difficult and cumbersome, which is why human-centered design, which involves people in the process, has been the most common approach to creating usable systems. Putting the

Schmidt et al. (2024): Simulating the Human in HCD with ChatGPT: Redesigning Interaction Design with AI. ACM Interactions.
<https://doi.org/10.1145/3637436>

Solution



Supported with
community-building events



Meta-HCI Workshop
@ ACM CHI 2025

Thank you



**Prompt engineering for
text-to-image generation:**

Output control, creativity,
interaction, misalignment

**New frontiers in HCI
Meta-Research**

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<https://www.jonaso.de>