

Workshop on Generative Artificial Intelligence in Interactive Systems: Experiences from the Community

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Abstract

Generative Artificial Intelligence (GenAI) is establishing itself in academia and industry through accessible implementations like ChatGPT and Stable Diffusion. Subsequently, GenAI is changing the interaction paradigms between users and computers. Currently, many individual approaches exist to leverage these tools, creating various strategies and agendas for using them in HCI research. Thus, we expect this will change how researchers design and create interactive interfaces. This workshop facilitates a common understanding of GenAI concerning HCI in which participants will share and discuss their experiences using GenAI and Large Language Models (LLMs) in HCI research. In this workshop, the potential of GenAI for Human-Computer Interaction will be explored and discussed with the research community through position papers, research statements, and opinions, thereby creating comprehensive practical insights synthesizing collective experience and strategies with real-world examples.

CCS Concepts

• **Human-centered computing** → **Human computer interaction (HCI)**; • **Computing methodologies** → *Artificial intelligence*; Natural language processing.



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Keywords

HCI, Research, Generative AI, LLMs, Stable Diffusion, ChatGPT

1 Introduction

In the last year, numerous workplace routines have undergone a major disruption. The success and widespread adoption of Generative Artificial Intelligence (GenAI) and Large Language Models (LLMs) [10] have enabled fast and automated ways to generate content, including text, images, and multimedia (also using diffusion models [11]). Various activities and events have discussed the potential and different use cases of AI tools (e.g., Elagroudy et al. [1]) and how its use will change traditional practices and set new standards – also in the Human-Computer Interaction (HCI) community. This involves new approaches to creating interactive systems, as well as novel possibilities in interaction. Examples like brainstorming product ideas [3], user research through AI-generated answers in surveys [12], assistants for paper reading [2], creative image generation [9], writing [13], or reviewing [7], or coding [14, 15] all show new approaches that free up time and resources and require to rethink our work habits. At the same time, this raises questions of ownership and agency, and practical questions, such as research reproducibility or reporting standards, arise when applying GenAI approaches. On a larger scale, this is true for all future systems employing GenAI: *Are users still in control?* Thus, this has attracted interest in the HCI community for studying functional improvements and their potential societal implications for future interactive systems (cf. in educational sectors [5]).

GenAI holds immense potential in enriching interactive systems across various domains. Concrete examples include a more natural



Figure 1: Image created by ChatGPT DALL.E: *The promotional image has been adapted to include a serpentine form in the center, symbolizing the dynamic and interconnected nature of the human-centered research cycle in the development of new technologies. The generation process and prompts can be found in Section A.1.*

interaction with conversational agents through LLMs [8], where the generated text is used as output. LLMs enable more fluid and contextually relevant interactions between users and virtual assistants in this context. The increased interest in applying GenAI for interactive systems has led to the rapid creation of personalized visual models [4], anticipating the increased adoption of GenAI for future interactive systems. Furthermore, LLMs can be used to produce source code for rapid software prototyping. Yet, several challenges regarding the correctness of such generations arise that need to be addressed carefully [6]. This is essentially true to ensure scientific integrity when AI-powered systems are used for tasks like paper reading assignments [2], writing [13], or reviewing [7].

This workshop brings together the German HCI community from research and industry to gather experiences and perspectives. This workshop aims to draw on individual experiences using GenAI in different HCI research or industry projects. By collecting the expertise from different stakeholders, we will identify existing practices and success stories for integrating GenAI into the HCI research cycle. The goal is to highlight individual approaches and create a *practical insights report*. This report synthesizes the collective experiences and practical insights with detailed examples of personal best practices for the wider HCI community. It can serve as a contribution from the *Mensch und Computer Community* to guide structured guidelines for best practices and uses of GenAI tools in future HCI research projects.

2 Workshop Contents and Planned Activities

We are planning a one-day physical on-site event on Sunday, 1st of September 2024, from 09:00 to 17:00 (see Table 1). We are open to extending the format to be hybrid. After the introduction, the workshop starts with a startup keynote. Afterward, the schedule consists of three 90-minute blocks with short breaks. The first session focuses on experience with GenAI in HCI research. Afterward, selected talks from participants will be presented in Pecha Kucha style. In the last block, the future innovations and challenges of

GenAI in interactive systems are discussed in a world cafe-style. After 20 minutes, a rotation will allow exposure to different discussions. We will conclude with a Wrap-up and Open Discussion summarizing individual experiences and best practices. The authors will invite the workshop attendees to develop a practical insights report based on the results. After the workshop, all experiences, tools, and tips will be gathered in an online document such as Google-Docs and made available to the participants. We aim to make this a living best practice guide from which people can get inspiration beyond the workshop scope.

3 Objective: Practical Insights Report

This workshop aims to bring stakeholders from HCI research and industry together and enable a discussion on individual experiences of the successful integration of GenAI in personal research activities and interactive systems. Our workshop wants to achieve two objectives: I) Gather best practices (what, where, when) for GenAI usage in the workflows of HCI researchers and practitioners in a living guide based on their experiences, and II) Facilitate a lively exchange between the HCI community members and foster potential collaborations between participants.

4 Target Audience and Call for Participation

We welcome participants and contributions from the whole spectrum of the HCI community: Researchers, interaction designers, visual artists, product developers, etc., who might provide their experience on leveraging the GenAI potential. Participants are requested to submit a position paper, which, upon acceptance, will be published on the website and included in the Practical Insights Report.

Many different use cases and innovative approaches using GenAI have emerged that have changed how we currently conduct HCI research. This workshop aims to bring the community together to share experiences and best practices that can shape guidelines

Table 1: The schedule of the workshop.

09:00	· · · · ·	Welcome and Introduction to the Workshop.
09:15	· · · · ·	Keynote: Startup Talk.
10:00	· · · · ·	Break.
10:30	· · · · ·	Session I: Experience on using GenAI in HCI research.
12:00	· · · · ·	Lunch Break.
13:00	· · · · ·	Session II: Talks by Participants.
14:30	· · · · ·	Break.
15:00	· · · · ·	Session III: Outlook on future GenAI interactions.
17:00	· · · · ·	Wrap up, Conclusions, and Feedback.
17:30	· · · · ·	End.

and new approaches of including tools like ChatGPT to research practices and interactive systems. One of the workshop's objectives is to create a practical insights report on different work practices and allow the exchange of alternative approaches and creative workarounds. We invite position papers that address prompts such as:

- What are routines that you have built for using GenAI in your research process, and how does this change how you execute different tasks?
- Describe a specific application of generative AI that has strongly impacted a particular task within your research process.
- How can GenAI be used to build human-centered interactive hands-free systems in the future?

We encourage researchers to share visions, hands-on experiences, or specific prompts that can be shared within the community to enhance creative solutions and reproducible applications. Submissions should be in the two-column ACM format and no more than three pages long, excluding references. The workshop website provides information; see <https://generativeai-hci.github.io/MuC-workshop/>. The talks and presentations will take place physically and be on-site. Participants will be selected based on the merit of their contribution to the workshop. Submissions should be made via Conftool. Accepted papers will be published in the *GI Digital Library*. At least one author of each accepted submission must attend the workshop. All participants must register for the workshop and at least one conference day.

5 Organizers

Anastasyia Zakreuskaya is a researcher at ExSitu Inria and a Ph.D. candidate at the Université Paris-Saclay in France, where she investigates how new technologies change collaboration and work practices in hospitals. Before this position, she worked at the Machine Learning and Data Analytics Lab at the Friedrich-Alexander Universität Erlangen Nürnberg and completed a research visit at NYU Langone's Healthcare Innovation Bridging Research, Informatics, and Design (HiBRID) Lab, gathering insights in how to build clinical applications that include new approaches like generative AI or automated workflows.

Tobias Münch is the CTO of Münch Gesellschaft für IT-Solutions and a Ph.D. student at Chemnitz University of Technology. He has implemented various PWA solutions in the finance, veterinary medicine, and logistics sectors for ten years. In his past research, he has focused on the maintainability of the World Wide Web and the use of standards. He talked about the availability and privacy issues of the WebSpeech API at the ACM WebConf 2023. His current research focuses on conversational user interfaces in progressive web apps and how they can be implemented in the context of web engineering and LLM-based AI.

Henrik Detjen is a Human-Computer Interaction Scientist at the Fraunhofer Institute for Digital Medicine MEVIS. He has a background in cognitive science and HCI in the automotive domain. His current focus is on the human-centered design of automated and autonomous systems in the medical domain, e.g., visual programming tools that aid medical researchers designing ML workflows

or patient interfaces that embody LLMs and other intelligent technologies.

Sven Mayer is an assistant professor of computer science at LMU Munich, Germany. His research sits at the intersection between Human-Computer Interaction and Artificial Intelligence, where he focuses on the next generation of computing systems. He uses artificial intelligence to design, build, and evaluate future human-centered interfaces. In particular, he envisions enabling humans to outperform their performance in collaboration with the machine. He focuses on areas such as augmented and virtual reality, mobile scenarios, and robotics.

Passant Elagroudy is a post-doctoral researcher at the intersection of innovation, as she works at the German Centre for Artificial Intelligence (DFKI) and RPTU Kaiserslautern University, Germany. With a Ph.D. in Computer Science from the University of Stuttgart, her work focuses on creating technologies that enhance human cognition. She contributed to major European research projects to augment memories like RECALL and AMPLIFY. She is also from the management team coordinating Humane AI Net, one of the largest research and industrial consortia, advancing ethical AI solutions for everyday life.

Bastian Pflöging is a professor for Ubiquitous Computing and Smart Systems at TU Bergakademie Freiberg, Germany. With a background in computer science, his expertise is in the fields of human-computer interaction, ubiquitous systems, multimodal interaction, natural user interfaces, and specifically automotive user interfaces. His research aims to understand how ubiquitous computing systems can support users with their tasks and activities while keeping the user in the loop and in control.

Fiona Draxler is a postdoctoral researcher at the University of Mannheim, working at the intersection of human-computer interaction and social data science. Her research focuses on human-AI interaction in application domains such as LLM-supported writing, AI methods in survey research, and the auto-generation of learning material in technology-supported education.

Benjamin Weyers is a junior professor for Human-Computer Interaction at Trier University. His primary interests in research and teaching lie in the scientific development and investigation of interactive systems, specifically focusing on using virtual and augmented reality technology in everyday work contexts and environments. He is especially interested in the use of Petri net-based description concepts and graph transformation systems for modeling flexible and adaptable user interfaces, virtual reality, interactive data analysis and information visualization, collaborative and learning systems, and ambient intelligent systems.

Uwe Gruenefeld is a postdoctoral researcher in Human-Computer Interaction at the University of Duisburg-Essen, Germany, and the co-founder of GenerIO.net. He works at the intersection of Mixed Reality and Artificial Intelligence. His research has focused on a range of topics, including the augmentation of human perception, usable security, cross-reality systems, and generative AI.

Waldemar Titov is a research scientist at the Furtwangen University. He conducts research in the fields of human-computer

interaction, usability, and digitalization in mobility, focusing on non-motorized means of transport and public transport. In the research project SmartMMI, he and his team researched and tested the provision of relevant data for public transport journeys directly in the train window. This approach enables the provision of intelligent information on transparent mobile displays, which allows passengers to find out about their route and current developments on the window during the journey.

Jonas Auda is a postdoctoral researcher at the University of Duisburg-Essen and the co-founder of GenerIO.net, a startup dedicated to human-centered generative AI. He has obtained a Ph.D. in Human-Computer Interaction, focusing on exploring interactions within virtual realities. His research has utilized emerging technologies such as electrical muscle stimulation to actuate users, drones for autonomously delivering haptic feedback, and brain-computer interfaces employing EEG for interacting in VR. Presently, his work centers around human-centered generative deep learning, where he holds a leadership position at GenerIO, driving the development of intuitive and accessible AI solutions.

Wendy E. Mackay is a Research Director, Classe Exceptionnelle (DR0), equivalent to a tenured full professor and a Professor Attaché at the Université Paris-Saclay. She received her Ph.D. from MIT and have served as Chair of ACM/SIGCHI, co-editor-in-chief of the journal *IJHCS*, was general chair of our flagship conference CHI'13, and received the ACM/SIGCHI Lifetime Achievement Award for Service. Her research group Ex)situ explores the limits of interaction and seek to create effective human-computer partnerships.

Daniel Buschek is a professor of Mobile Intelligent User Interfaces at the University of Bayreuth, Germany. His group works at the intersection of Human-Computer Interaction and AI, exploring interaction with models for text and images to shape the future of working with AI tools in a human-centered way.

Thomas Kosch is a professor of the Human-Computer Interaction Group at the Humboldt University of Berlin. His research focuses on implicit AI-driven physiological interfaces, user sensing, and user state predictions for human augmentation and self-reflection. He integrates his research into the next generation of user interfaces, including extended reality and generative artificial intelligence. This includes conceptualizing, designing, and implementing unobtrusive user sensing and interaction. He is experienced in designing user studies, quantitative and qualitative methods, machine learning, and prototyping.

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A Appendix

A.1 Image creation by ChatGPT / DALL-E

Prompts for generating the promotional image:

- You:** So, I am thinking out loud with you - let's first discuss the image which I would like to generate and then you will generate a suggestion
- ChatGPT:** Absolutely, I'm here to help you with that. Feel free to share your ideas and requirements for the image you have in mind, including any specific elements, themes, color schemes, or messages you want to convey. Once we've discussed and refined your concept, I can then generate a suggestion for the image creation. Let's get started!
- You:** okay, only if I say - "great, generate" you will generate this image, okay?
- ChatGPT:** Understood! I'll wait for your signal with "great, generate" before proceeding to generate the image. Let me know your ideas, and we can discuss them until you're ready.
- You:** which information do you need from me to generate a suitable image?
- ChatGPT:** To generate a suitable image, I would need the following information from you:
- Theme and Purpose:** A brief description of what the image is for (e.g., a workshop cover, presentation slide, promotional material) and the central theme or message you want the image to convey.
 - Key Elements:** Specific elements you want included in the image, such as objects, symbols, characters, or any particular scene. For example, if the image is related to technology, you might want elements like computers, AI motifs, neural networks, etc.
 - Style and Tone:** The overall style and tone of the image (e.g., realistic, abstract, futuristic, vintage) and whether it should be more formal, playful, serious, or whimsical.
 - Color Scheme:** Preferred colors or color scheme, if you have any in mind. Colors can significantly affect the mood and perception of the image.
 - Text in the Image:** Any text or titles you want to include in the image, along with preferences about its placement and importance.
 - Size and Orientation:** If you have a specific size (e.g., 1024x1024 pixels) or orientation (e.g., landscape, portrait) in mind.
 - Any References or Inspirations:** Links to or descriptions of any reference images, artworks, or styles that inspire you or you'd like the image to resemble in some way.

With these details, I can create a more tailored and appropriate suggestion for your image. Feel free to share as much information as you can based on these guidelines!

- You:** Okay, these are my answers: Theme and Purpose: promotional material, this image will appear at the beginning of the manuscript proposal and maybe also on some social media pages to advertise the workshop - if people like it, it could be used for broader purposes and maybe bigger events too Key Elements: The human-centered research cycle for new technologies is the key element of the image, it could for instance show some researchers in their process of finding out how to create usable technologies, at the same time these researchers are supported by Artificial Intelligence ... but I don't really know how to display this yet Style and Tone: The overall style should be simple, a bit abstract and formal but can include some playful elements. I don't like comic or vintage style! Text in the image: it is not necessary to include text in the image, rather it should already prompt some ideas by only looking at the visual elements Size and Orientation: the image should be in landscape format Any references: I don't have ideas about this yet
- Do you have any other questions?

- ChatGPT:** Thank you for the detailed information! Based on what you've shared, here's a concept for the image: We'll design an image that visually represents the human-centered research cycle in the development of new technologies, emphasizing the collaboration between researchers and artificial intelligence. The scene could feature abstract human figures engaged in various stages of research and development (such as brainstorming, designing, testing) around a central, flowing motif that suggests a cycle or feedback loop. This cycle could be visually connected or supported by abstract representations of AI, such as stylized neural networks or digital patterns, subtly implying AI's role in enhancing the research process. The style will be simple and somewhat abstract, maintaining a formal tone with a few playful elements to keep it engaging. The color scheme could lean towards modern and clean, with blues, greens, and purples, to convey innovation and creativity without overwhelming the viewer. The landscape orientation will make it suitable for both manuscript proposals and social media promotion. Before proceeding, do you have any preferences or adjustments to this concept, or would you like to add any specific elements to make it more aligned with your vision?

- You:** this sounds interesting, show me how it would look like
- ChatGPT:** [Generated image 1 through DALL-E] The promotional image designed to visually represent the human-centered research cycle in the development of new technologies, with an emphasis on the collaboration between researchers and artificial intelligence, has been created.



Generated image 1 through DALL-E



Generated image 3 through DALL-E



Generated image 2 through DALL-E



Generated final image through DALL-E

Figure 2: Images created by ChatGPT Dall.e as explained in the displayed prompts of the conversation.

This landscape-oriented image integrates abstract human figures and AI elements in a cycle of research and development, using a simple yet somewhat abstract style with a modern color scheme. It's crafted to suit manuscript proposals and social media promotion without the need for text, aiming to prompt ideas and engage viewers through its visual elements alone.

You: interesting, can you make it less playful and a bit more formal?

ChatGPT: [Generated image 2 through DALL-E] The revised promotional image has been created with a more formal and less playful approach. This version maintains the abstract depiction of the human-centered research cycle, focusing on a cleaner and more sophisticated design that emphasizes collaboration between researchers and artificial intelligence. The color scheme remains modern with blues, greens, and purples but is used in a subtler, more professional tone to convey innovation and creativity. This image is designed to suit manuscript proposals and social media promotion while emphasizing a formal and professional appearance.

You: now it looks like the Artificial intelligence is in the center - but actually the human should be in the center. I like the circle and the elements around it and the

people at the computers - can you include more diverse technologies ? such as virtual reality? And I would prefer a more minimalistic style - the background and mountains are too much

ChatGPT: [Generated image 3 through DALL-E] The promotional image has been refined to more prominently feature the human element at the center of the research cycle, with a focus on human-centered design in the development of new technologies. This version adopts a more minimalist style, removing the background elements for a cleaner look and incorporating a broader range of technologies, including virtual reality, to showcase diverse technological engagement. The design remains modern and professional, with a restrained color scheme that emphasizes the central role of humans in technology research and development.

You: One last idea - I liked the serpentine form in the middle on the first image - can you take the last suggestion and adapt it?

ChatGPT: [Generated final image through DALL-E] The promotional image has been adapted to include a serpentine form in the center, symbolizing the dynamic and interconnected nature of the human-centered research cycle in the development of new technologies. This version

retains the minimalistic style and landscape orientation, with a focus on the human element and a variety of technologies, including virtual reality. The serpentine form integrates with the circular motif, enhancing the

sense of movement and interconnectivity. The color scheme remains modern and restrained, ensuring the image is clean, focused, and suitable for a formal and professional context.