

# Augmenting Human Creativity with AI

Edited by

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## Abstract

The advancements of available generative AI tools have the potential to change the creative processes of writers, artists, programmers, and designers. The Dagstuhl seminar “Augmenting Human Creativity with AI” explored the grand challenges these tools pose to the discipline of Design and human creativity more generally. Over the course of three days, academic researchers and Industry experts from the fields of Human-Computer Interaction, AI, and Design came together to discuss how these technologies challenge accepted ideas of human creativity and what are the implications for the creative class when AI tools are used to augment creativity on a broader scale. The discussions revolved around three core themes: critical evaluation of AI-powered creative tasks, ethical implications of integrating AI into creative processes, focusing on ensuring the responsible and equitable use of these technologies, and the societal impact of delegating creative tasks to AI systems, including the potential consequences for the creative professions and cultural landscape. The seminar’s outcomes articulated a shared research agenda that moves beyond tool-building to focus on the design of infrastructure, practice, and educational frameworks that preserve creative agency and support diverse forms of expression. The seminar produced a collective vision, one that looks beyond building better tools and discusses an agenda towards cultivating the systems, norms, and learning environments needed to keep human creativity at the centre.

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## 2 Executive Summary

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The seminar “Augmenting Human Creativity with AI” brought together 28 international researchers, artists, and practitioners from design, art, computer science, and Human–Computer Interaction (HCI). The seminar examined how generative AI systems are reshaping creative practice, not merely as productivity tools, but as infrastructures that redistribute agency, authorship, power, and responsibility. Throughout the three days filled with keynotes, provocations, discussions, and collaborative synthesis, the seminar explored three interrelated concerns: (1) how AI systems in creative practice should be critically evaluated and designed beyond efficiency and output quality; (2) how ethical governance, attribution, and ownership can be meaningfully embedded into creative AI infrastructures; and (3) how the increasing delegation of creative labor to AI systems reshapes cultural values, aesthetic norms, and societal power structures. A recurring tension throughout the seminar was that AI simultaneously amplifies and attenuates human creativity, which enables new forms of expression while constraining agency through opaque models, standardised interfaces, and platform dominance.

Two keynote talks framed these discussions. Baptiste Caramiaux’s keynote, “Regaining Power Over AI: Insights from Artistic Practices,” examined AI as a material, medium, tool, and companion, introducing a three-dimensional power framework (moral, structural, and cultural) to analyse how generative AI systems shape creative agency, authorship, and visibility. Maria Luce Lupetti’s keynote, “Down the Algorithmic Rabbit Hole: Rethinking Design and Power in AI,” challenged dominant narratives of AI “magic,” highlighting how design practices can either obscure or expose the socio-technical assumptions embedded in AI systems. Together, these perspectives foregrounded creativity as a situated, contested, and political practice rather than purely technical capabilities. Building on this foundation, participants engaged in provocations and working sessions that culminated in five thematic working groups. These groups addressed: (1) the relationship between AI systems and the uniqueness of creative practices; (2) interaction paradigms beyond text-based prompting; (3) the evaluation of creativity beyond productivity metrics; (4) authorship, attribution, and disclosure in AI-mediated creation; and (5) AI literacy and education in creative domains. Rather than producing finalised solutions, the groups articulated research questions, design principles, and longer-term trajectories spanning master projects, PhD research, and large-scale collaborative initiatives.


Across the working groups, several cross-cutting research themes emerged. Participants emphasised a shift from large, general-purpose models toward smaller, situated, and personalized AI systems that better support craft, positionality, and local control. The re-authoring of creativity surfaced as a central concern, with debates around whether creators become curators of algorithmic outputs and how co-authorship with AI or simply use of AI-based tools might be made visible throughout the creative process. The seminar also highlighted the aesthetic and epistemic value of imperfection, arguing for AI systems that embrace noise, glitches, and discomfort rather than optimising for coherence and polish. In parallel, participants identified a significant evaluation gap between machine-learning benchmarks

and human-centered notions of creativity, calling for process-oriented, experiential, and reflective evaluation methods. Finally, concerns about the invisibility of AI as infrastructure underscored the need to design for long-term critical reflection, even as AI systems become normalised and embedded in everyday creative practice. Overall, the Dagstuhl Seminar on Augmenting Human Creativity with AI provided an interdisciplinary forum for reframing creative AI use as a socio-technical, cultural, and ethical endeavour. The seminar's outcomes articulate a shared research agenda that moves beyond tool-building toward the design of infrastructures, practices, and educational frameworks that preserve agency, trigger reflection, and support diverse forms of creative expression. The insights in this report lay the groundwork for future collaborations seeking to shape creative AI systems that are not only powerful but also pluralistic, transparent, and human-centred.

### 3 Overview of Talks

#### 3.1 AI Models' Transparency Through Art: Between Enchantment and Critical Distance.

*Federico Bomba (Freie Universität Bozen, IT)*

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© Federico Bomba

Artificial Intelligence is often perceived as neutral and objective, masking biases, hidden labour, and infrastructural power. Transparency has become a pressing concern in generative AI, as these systems increasingly influence how knowledge, culture, and decisions are produced. This provocation presents *The Models*, an interactive installation by the artist duo *dmstfctn*, that stages large language models as improvised performers within the tradition of Italian *Commedia dell'Arte*. By embodying tendencies such as hallucination, antagonism, and servility, the work invites audiences to both believe in and question the machine. Building on this case, the talk introduces the notion of a *smark* stance: an oscillation between enchantment and critique enabled by a temporary suspension of disbelief. I argue that this ambivalent engagement allows generative AI to be experienced as neither infallible nor merely instrumental, opening a space where errors become legible and meaningful. Artistic practices like *The Models* suggest that fairness in AI can be cultivated through experiences that expose, rather than conceal, the systems' limits.

#### 3.2 Regaining Power Over AI: Insights from Artistic Practices

*Bapiste Caramiaux (Sorbonne University - Paris, FR)*

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AI has made significant inroads into the creative and cultural sectors, both as a tool or medium and as a socio-political object. In this presentation, my aim is to highlight the friction that exists between technological innovation in AI and artistic practice. To do this, I review current knowledge on AI practices (pre-genAI and genAI) in artistic practices. I show that the latest generations of AI have diminished artists' agency over these technologies, both from a material and a cultural and political point of view. I then propose a framework

for understanding the power relations between innovation and creative practices in three dimensions: cultural, structural and ethical. This framework is a way of encouraging more research into these socio-technical issues, beyond the opportunities and challenges that AI poses for the arts sectors.

### 3.3 Training Otherwise: Sound Generation as a Speculative Site

*Mona Hedayati (University of Antwerp, BE & Concordia University, Montreal - CA)*

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(Artistic Provocation)

This artistic research demo presented an ongoing project that explores sound generation through a small, carefully curated dataset composed of socio-political sonic material. Countering the tendency to optimize for scale and efficiency that dominate contemporary machine learning practices, the project employs a small-scale sound corpus to train a generative sound model capable of producing unexpected and speculative sonic outputs. The results thus serve as an inquiry into how machine learning systems mediate complex situated lived realities. As such, the project foregrounds the ethics and aesthetics of working with data through embodied interaction with relevant material to construct a dataset, situating model training as a relational and iterative process unlike result-driven paradigms. In contrast to large-scale models reliant on massive amounts of compute and extractivist data logics, this work investigates how slow and small datasets and attentive training practices can open alternative modes of human-machine collaboration. By treating sound generation as a site for speculative experimentation beyond accurate representation, the project contributes to ongoing debates in artistic research and critical AI about the politics of data as knowledge, the materiality of training processes, and the possibilities of alternative machine learning practices.

### 3.4 The Marginal, Overlooked, or Very Different GenAI

*Lone Koefoed Hansen (Aarhus University, DK)*

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**Joint work of** Pold, Søren; Eriksson, Eva; Dalsgaard, Peter

**Main reference** Eriksson, E., Hansen, L. K. and Dalsgaard, P. We Won't Be Talking About GenAI in 2035, and That's a Problem. *Interactions*, 32, 6 (/ 2025), 26-30.


**URL** <https://doi.org/10.1145/3764916>

The purpose of my presentation was to focus on the marginalising aspects of technology adaptation as well as ways of using GenAI to suggest different kinds of histories, realities, and desires. I presented a recent essay that I co-authored [2] suggesting that applying a 10-year perspective makes it possible for us to see aspects of a technology, for instance what it marginalises, that are in many ways difficult to see on a day-to-day basis. In the essay, we use the example of how IoT technologies enables harm-doing in domestic abuse situations to ask how we might as researchers be better at understanding the potential harms that any technology (here: generative AI) will be able to lead to. I then proceeded to presenting two artists who use GenAI in their practice. First was the Swedish artist Arvida Byström,

who in the piece "In the Clouds" (2024) worked with apps that can visually strip naked any human on a photograph. With this, she interestingly explores how the algorithms in the app "dream-up" impossible bodies, both expanding the idea of what a body might look like and exploding how the algorithm has a very narrow idea of the female body. I recently co-authored an article (in Danish) on this project [1]. Second artist is Danish artist Kristoffer Ørum, who uses GenAI to imagine what the cities and countries he works with could look like, had our social ideologies been different. Specifically, he asks what the city of Aarhus (Denmark) would look like if the positive energies and ideologies of equality and creativity that we also find in hip-hop culture had been the dominant political organising principle. In total, the aim of my talk was to use my recent work/research to spark conversations on how we might think about which worlds are being built with GenAI.

### 3.5 Down the Algorithmic Rabbit Hole: Rethinking Design and Power in AI

*Maria Luce Lupetti (Polytechnic University of Torino, IT)*

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© Maria Luce Lupetti

This talk, Down the Algorithmic Rabbit Hole: Rethinking Design and Power in AI, explores how design practices shape, sustain, and can contest dominant narratives of artificial intelligence. Drawing on Lewis Carroll's *Alice in Wonderland* as a metaphorical framework, the presentation guides the audience through the multiple "characters" of AI—each symbolizing a tension in contemporary sociotechnical systems. The White Rabbit represents the lure of AI hype and techno-solutionism; the Queen of Hearts embodies irrational power and moral hypocrisy embedded in algorithmic norms; while the Cheshire Cat stands for ambiguity, multiplicity, and alternative imaginaries. Through a series of design research projects—including *Shybo*, *Steering Stories*, *Dramatic Things*, and more—the talk illustrates how speculative and participatory design methods can reveal and challenge hidden assumptions in AI narratives, from automation myths to biased data infrastructures. These projects reimagine AI not as a neutral or magical force but as a contested terrain of politics, labor, and meaning-making. The second half of the presentation introduces Participatory Design Justice for Ethical AI Transitions (PARJAI), a €1.3M research project funded by the Italian Ministry of Education and Research. PARJAI investigates how participatory design can advance social justice in AI transitions across domains such as health, work, and energy—addressing power by exclusion and opacity. Ultimately, the talk argues for a shift from designing for AI systems toward designing with diverse publics, acknowledging participation as both a site of empowerment and exploitation. By embracing ambiguity, plurality, and collective imagination, designers can move beyond enchantment toward more reflexive, just, and accountable AI futures.

### 3.6 From Prompting to Partnering: Designing AI Systems that Augment Human Creativity

*Christoph Maerz (DFKI GmbH - Kaiserslautern, DE)*

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Recent advances in generative AI have shifted human–AI interaction from isolated prompting toward more sustained and integrated forms of collaboration. This provocation explores how this shift changes the role of AI systems in creative and knowledge-intensive work, moving from tools that produce outputs toward systems that actively participate in human sensemaking and ideation. Drawing on the theory of extended cognition, the talk examines how contemporary approaches such as AI assistants, deep research systems, multimodal avatars, and agent-based workflows can be embedded into ongoing creative processes. Examples from creative practice, education, and applied research illustrate how these systems influence the structure, pace, and framing of creative work. The provocation highlights both the potential and the open questions that arise when AI becomes a persistent partner in human creativity, inviting further discussion on how such systems should be designed, evaluated, and situated in real-world contexts

### 3.7 Against the Dark Force: Gravitational Attractors in GenAI

*Dave Murray-Rust (TU Delft, NL)*


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In this talk, I develop the metaphor of black holes as a way to conceptualise the gravitational pull of generative AI systems on human culture and thinking. Gravity gives an invisible structure that spreads throughout space, shaping movement, modulating energy. As humans, we spend our time in negotiation with gravity, to stand up, to move around. We are aware of it, yet there are no single organs of gravity with which we sense it - we construct our understanding from a composite overview of proprioceptions and pressures. While we may fight against gravity, we also need it - without this invisible structure, there would be no fire, no rain, no potential for soaring and flying - simply floating. Gravity is a self-reinforcing phenomenon: as masses are drawn together, their combined gravities increase until, in the limit, black holes form, structures in space-time from which no light or other information can escape. We can read current AI development through this lens: the gravity of large models pulling our creative endeavour into particular directions and forms. Within this framing, gravitational attractors - black holes - emerge, that warp the cultural fabric in particular directions. Three of them are explored in the talk. Firstly, the idea that everything of interest can be coded and encoded in a text box. This creates a focus on written language, which is powerful, for its range and breadth, but elides all possibility of rhythm, texture, gesture and so on. Secondly, the functional form of transforming one thing into another: an interaction paradigm that gives interesting results when the subjects are rich, as the world of style transfer, or the transformation of text descriptions into images shows, but which misses other conceptual configurations for making use of technological intervention. Finally, the 'make it shiny' button, that transforms rough thoughts into polished text, automates musical mastering or fills in details in sketches and photographs. Here, not only is the

kind of perfection provided problematic through its bland centrality, it focuses the idea that perfection is the goal of creative endeavour, rather than the interesting things that happen along the way. In response to these black holes - which are only three among many - I propose useful creative structures for moving against gravity: intermediate level toolkits that allow constructive experimentation; development of new conceptual maps that highlight the space between the attractors; and direct attempts to break the programming that leads to the same endpoints.

### 3.8 Two Provocations: (1) AI commons, and (2) Small Data and Model Crafting.

*Philippe Pasquier (Simon Fraser University - Surrey, CA)*

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 URL <https://www.metacreation.net/>

From Minitel's hum to GPUs' glow,  
 Our world computes, we reap, we sow.  
 AI now hums beneath the art,  
 A hidden hand in every part.  
 Who owns this AI that learns our way?  
 Who shapes the dreams machines convey?  
 The Commons call for code set free,  
 For artists' rights and equity.  
 Not Big Data's greedy sprawl,  
 Our hand-crafted models are small. Where care and craft replace the race,  
 And creative AI finds its place.

### 3.9 Everyone Can Already Sing: Challenging Technosolutionism in Musicking (Provocation)

*Courtney Reed (Loughbrough University London, GB)*

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Rachel Freire, and Courtney N. Reed. 2024. Body Lutherie: Co-Designing a Wearable for Vocal Performance with a Changing Body. Proceedings of the International Conference on New Interfaces for Musical Expression. DOI: 10.5281/zenodo.13904800]Courtney N. Reed. Enculturation and Value Encoding in the Design of Vocal DMIs. Proceedings of the Computer Human Interaction and Music nEtnetwork (CHIME) Annual Conference 2024.

Rachel Freire, and Courtney N. Reed. 2024. Body Lutherie: Co-Designing a Wearable for Vocal Performance with a Changing Body. Proceedings of the International Conference on New Interfaces for Musical Expression. DOI: 10.5281/zenodo.13904800  
 (Artist Provocation)

The topic of the talk centred around a paper entitled 'Anyone Can Sing,' (the citation of which is intentionally not included to avoid drawing negative attention to the article, as

that's not the purpose), which is a typical example of the technosolutionist mindset in the development of digital creative tools.

The paper discusses a generative system that allows a user to input spoken voice samples to generate a realistic output of their cleaned and edited singing voice in different styles and contexts. While technically sound and demonstrating cutting edge audio analysis and style transfer technique, the applications demonstrate a social positioning that is embedded in technology: correcting typical singing voices to trends set in music consumption and, instead of singing "Happy Birthday" to your friend or child in your own voice (with your own identity and intention), to produce a cleaned and polished version of "you" as if you were a pop singer.

This work, and other similar papers, positions particular styles, such as classical Western traditions, as being superior to others, diminishes the value of "untrained" singing. This view is derived from colonial and capitalist values that position different (e.g., indigenous, non-white, untrained in the styles valued by upper class European society) vocal qualities as being more aesthetically appealing or "correct", although there is no factual grounding in this typically-held belief.

This provocation centred the sociocultural biases underlying these digital technosolutionist approaches and questioned the deeply held beliefs that we have in society about music making and who is allowed to do it. In centring "bad" art as having inherent value and something deeply communicative between and about human beings, we can challenge these assumed norms and views of value in the creation of digital tools.

### 3.10 Enhancing Creativity in the Enterprise with AI

*Justin D. Weisz (IBM TJ Watson Research Center - Yorktown Heights, US)*

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**Joint work of** Brimijoin, Kristina; Ebeling, Jule; Foreman, Morgan; Gonzalez, Gabriel; He, Jessica; Houde, Stephanie; Kunde, Siya; Muller, Michael; Ross, Steven; Silva Moran, Dario; Weisz, Justin

Ebeling, J. (2025, July). AI as a Creative Partner: Investigating how Different Levels of AI Proactivity Shape User Experience and Creative Output in Collaborative Idea Generation. Master's Thesis, Bauhaus-Universität Weimar, Germany.

He, J., Houde, S., Gonzalez, G. E., Silva Moran, D. A., Ross, S. I., Muller, M., & Weisz, J. D. (2024, June). AI and the Future of Collaborative Work: Group Ideation with an LLM in a Virtual Canvas. In Proceedings of the 3rd Annual Meeting of the Symposium on Human-Computer Interaction for Work (pp. 1-14).

Houde, S., Brimijoin, K., Muller, M., Ross, S. I., Silva Moran, D. A., Gonzalez, G. E., Kunde, S., Foreman, M. A., & Weisz, J. D. (2025, March). Controlling AI Agent Participation in Group Conversations: A Human-Centered Approach. In Proceedings of the 30th International Conference on Intelligent User Interfaces (pp. 390-408).

Muller, M., Houde, S., Gonzalez, G., Brimijoin, K., Ross, S. I., Moran, D. A. S., & Weisz, J. D. (2024, June). Group Brainstorming with an AI Agent: Creating and Selecting Ideas. In International Conference on Computational Creativity.]Gonzalez, G. E., Moran, D. A. S., Houde, S., He, J., Ross, S. I., Muller, M. J., Kunde, S., & Weisz, J. D. (2024, March). Collaborative Canvas: A Tool for Exploring LLM Use in Group Ideation Tasks. In Joint Proceedings of the ACM IUI 2024 Workshops, co-located with the 29th Annual ACM Conference on Intelligent User Interfaces (IUI 2024), Greenville, South Carolina, USA, March 18, 2024, CEUR-WS.org/Vol-3660.

Ebeling, J. (2025, July). AI as a Creative Partner: Investigating how Different Levels of AI Proactivity Shape User Experience and Creative Output in Collaborative Idea Generation. Master's Thesis, Bauhaus-Universität Weimar, Germany.

He, J., Houde, S., Gonzalez, G. E., Silva Moran, D. A., Ross, S. I., Muller, M., & Weisz, J. D. (2024, June). AI and the Future of Collaborative Work: Group Ideation with an LLM in a Virtual Canvas. In Proceedings of the 3rd Annual Meeting of the Symposium on Human-Computer Interaction for Work (pp. 1-14).

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Muller, M., Houde, S., Gonzalez, G., Brimijoin, K., Ross, S. I., Moran, D. A. S., & Weisz, J. D. (2024, June). Group Brainstorming with an AI Agent: Creating and Selecting Ideas. In International Conference on Computational Creativity.

Ideation – the process of coming up with new ideas in response to a prompt or provocation – is a common activity in design thinking practice. Generative AI is quite capable of producing ideas in response to a prompt, but are they valuable? At IBM, we have created multiple tools to support ideation in groups: Koala, a Slack bot that participates in group brainstorming sessions, and Collaborative Canvas, a virtual canvas where people can use AI to generate ideas on virtual sticky notes, either publicly or privately. Studies of these tools have shown that participants find them to be valuable and participants preferred having AI participate in their group. Further, the best ideas were those where both humans and AI made some form of contribution. However, the presence of AI-generated ideas tended to reduce the overall diversity of ideas produced by the group, showing a nuanced effect of AI on the ideation process and outcomes.

## 4 Working groups

### 4.1 How Can AI Systems Relate to the Uniqueness of Creative Practices?

*Tilman Dingler (TU Delft, NL), Lynda Hardman (CWI - Amsterdam, NL), Mona Hedayati (University of Antwerp, BE & Concordia University, Montreal - CA), Steven Rick (NVIDIA - Santa Clara, US & MIT - Cambridge, US), Libuše Hannah Veprek (Universität Tübingen, DE), Boyu Xu (Utrecht University, NL), and Hiromu Yakura (MPI für Bildungsforschung - Berlin, DE)*

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**Joint work of** Hardman, Lynda; Hedayati, Mona; Rick, Steven; Veprek, Libuše Hannah; Xu, Boyu; Yakura, Hiromu

Group 1 examined how AI systems can meaningfully engage with the situated, idiosyncratic, and often non-linear nature of creative practices. Participants identified a central limitation of contemporary generative AI tools: their tendency to promote design fixation, homogenization, and “echo chambers” through simplified input–output interaction models. Such paradigms obscure the rich, iterative, and exploratory processes that characterise creative work. In response, the group explored how AI systems might be designed to surface and support the in-between, i.e., the intermediate states, transformations, and uncertainties that occur between

prompt and output. Emphasis was placed on interaction paradigms that invite tinkering, transparency, and serendipitous discovery, enabling creators to navigate, manipulate, and reflect on generative processes rather than merely consume results. The group proposed a multi-stage research agenda. First, ethnographic studies with creative practitioners would document existing workflows, values, and frictions in AI-assisted creation. These insights would inform a shared knowledge base mapping current AI tools, their affordances, and, critically, what is missing. Building on this foundation, the group envisioned speculative and experimental design explorations that challenge linear interaction models, for example, through visualizing generative processes, enabling non-linear intervention, or introducing productive friction. The overarching goal is to reconceptualise AI systems not as automated generators, but as creative partners that preserve authorship, support exploration, and amplify the uniqueness of individual creative voices.

## 4.2 Expanding Interaction Possibilities in AI Systems Beyond the Text Box

*Elisa Giaccardi (Polytechnic University of Milan, IT), Jesse Josua Benjamin (TU Eindhoven, NL), Baptiste Caramiaux (Sorbonne University - Paris, FR), Sarah Fdili Alaoui (University of the Arts - London, GB), Janet Johnson (University of Michigan - Ann Arbor, US), Christoph Maerz (DFKI GmbH - Kaiserslautern, DE), Dave Murray-Rust (TU Delft, NL), and Vasiliki Tsaknaki (IT University of Copenhagen, DK)*

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**Joint work of** Benjamin, Jesse; Caramiaux, Baptiste; Fdili-Alaoui, Sarah; Gacardi, Elisa, Maerz, Christoph, Murray-Rust, Dave, Tsaknaki, Vasiliki

Group 2 explored how AI systems might better support “humaning” by expanding interaction beyond text-based interfaces toward multimodal, embodied, and relational forms of engagement. Rather than treating multimodality as a purely technical extension of existing interfaces, the group focused on what the generative and fuzzy qualities of contemporary AI introduce as fundamentally new interaction possibilities. Central to this exploration was a shift from efficiency-driven conversational models toward slower, more reflexive, and contemplative modes of interaction, including tactile, contextual, and sensual interfaces that engage the whole body.

The group also investigated “black box” strategies not as mechanisms for transparency, but as sites for intimacy, viscosity, and negotiated understanding, asking what it might mean to relate to AI without fully opening it or optimizing it. They discussed hegemonic narratives embedded in conversational AI, proposing alternatives such as conversational consent, bidirectional negotiation, and embodied manifestations of AI from products to robotics. They also foregrounded the importance of limits, articulating the concept of “un-AI”: negative spaces, black holes, and contexts where AI should deliberately not exist.

## 4.3 Evaluation Metrics – How Do We Measure Creativity?

*Tilman Dingler (TU Delft, NL), Joseph Lindley (Lancaster University, GB), Philippe Pasquier (Simon Fraser University - Surrey, CA), and Courtney Reed (Loughborough University London,*

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**Joint work of** Lindley, Joseph; Pasquier, Philippe; Reed, Courtney

Group 3 addressed the fundamental challenge of evaluating creativity in human–AI collaboration, arguing that prevailing evaluation approaches are ill-suited to creative practice. Current methods are often derived from machine learning benchmarks or productivity-oriented software metrics, and hence tend to reduce creativity to binary distinctions (e.g., good vs. bad, human vs. machine) or artifact-centric measures that neglect process, experience, and meaning. The group proposed a shift toward holistic, process-oriented evaluation frameworks that reflect creativity as situated, contested, and value-laden. Rather than privileging output quality alone, evaluation should account for dimensions such as expressivity, authorship, control, ownership, novelty, authenticity, trust, and the productive role of randomness and imperfection. Participants emphasised that creativity often emerges through struggle, iteration, and discomfort, which are qualities that are often obscured by efficiency-driven metrics. To operationalise this perspective, the group outlined several directions for future work. These include developing functional applications that embed alternative evaluation logics, exploring participatory and narrative-based assessment methods, and supporting community-driven governance frameworks for evaluating creative AI systems. At a deeper level, the group called for a craft-based epistemology of AI, one that recognises tacit knowledge, embodied practice, and experiential judgment as legitimate forms of evaluation. Ultimately, the group aims to establish new standards for assessing creativity that resist reductive quantification and instead honour the complexity of creative work in AI-mediated contexts.

#### 4.4 Attributions

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Group 4 explored the question of attribution as an important concept in contemporary creative practice delineating reception and authorship of creative products in the context of the use of Generative AI. New technologies often challenge traditional approaches to notions of authorship in creative production. As Benjamin argued, new technologies can transform what constitutes a creative product, challenging traditional notions of authenticity, uniqueness and value of creative work [3]. The emergence of generative AI systems has introduced another such challenge to our notions of creativity and authorship. In 2022, James M. Allen created a visual art piece entitled Théâtre D'opéra Spatial using Midjourney, which won a fine arts competition with a \$300 cash prize [6]. When the artist submitted a request to the United States Copyright Office for registration of the image, the request was refused because "the Work contains more than a *minimis* amount of AI-generated content" which can not be separated from human contribution and thus could not be said to be the work of "human

authorship" [8]. As generative AI becomes ever more integrated into everyday creative practices, from essay writing to image creation, the question of attribution of authorship becomes ever more important across domains.

What does authorship look like when agentic AI systems are involved in co-production of content? Group and collective authorship of creative content has been a point of debate and concern for decades. Authorship and attribution are a type of contested performativity, a form of cultural production and form the basis for valuations of creative output [5]. What happens when we begin to think in terms of LLMs though - who is then speaking through the LLMs as these systems ingest human-generated content and ideas and then reproduce, remix, reformulate them in response to prompts? Who is included and who is excluded a culturally contested space of creativity? The practice of naming and attribution of the creative product can privilege the loudest voices and has repeatedly motivated explorations of alternatives to traditional naming and authorship expressions [4]. With the use of generative AI, how do we mark and signal authorship and what cultural changes might come about as "with the use of AI" becomes a common signal?


Past work at IBM on attribution for working with AI systems has explored attribution as a form of ownership or acknowledgement of contributions of different types made to a creative work. Acknowledging that different communities have different attribution standards (the credit taxonomy), He, Houde and Wiesz [7] developed the IBM AI attribution toolkit (<https://aiattribution.github.io/>), providing a language to describe how AI was used to create a work. Clearly the new vocabulary is needed to signal and debate emerging notions of (co)authorship, ownership, credit, provenance when creative work is produced using generative AI systems. The questions become ever more complex however, as the proliferation of these systems across creative digital tools can result in creative practice that may be unaware of the use of Generative AI.

The group discussed many aspects of attribution, coming up with a loose taxonomy of what might constitute appropriate tracking and provenance marking: - provenance, authorship, ownership, attribution - origin or location - effort that goes into creation of output - tracking from output to original - tracing back to original sources

The resulting discussion noted that in the end we arrive at impossible tasks of provenance tracking, such as: what would it take to trace the origin for every text? Creative content production is ubiquitous, but where are the limits to attribution? Does everything need to be attributed or only things generated with particular types of generative AI systems? Is the question of attribution rooted in the use of prompts or should we consider all generative AI tool use? Current debates propose technical marking of AI generated content through the C2PA provenance marking standards (<https://c2pa.org/>) or watermarking and other computationally more intensive approaches. Yet the question remains on what ought to be marked, when and why. What effects visibly or invisibly marking AI-generated or AI-assisted content will have on cultural production, creative pursuits and what comes to constitute authenticity for the work of art in the age of Generative AI. The group identified productive questions for research that is crucial for both tracking the normative evolution of how people will interpret AI-produced or AI-augmented content and, potentially, developing mechanisms for affecting this normative evolution by providing new mechanisms for marking and reflection.

## 4.5 AI Literacy and Education in Design and Creative Practices

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Artificial intelligence is increasingly embedded in design and creative education and hence reshapes how students ideate, iterate, and produce work. While these tools offer clear benefits in terms of speed and experimentation, they also challenge long-standing pedagogical assumptions about the importance of process, authorship, and learning in studio-based contexts. Educators are therefore faced with a dual task: mitigating the risks AI poses to reflective, process-oriented design practice while simultaneously exploring how its capabilities can be meaningfully integrated into curricula. This report reflects on these tensions through the lens of design education, drawing on observations from a focused working group to identify emerging challenges, opportunities, and educational strategies for fostering critical, transparent, and sustainable uses of AI in creative classrooms.

### 4.5.1 AI and the Erosion of Process-Oriented Design Thinking

AI is rapidly diffusing into creative classrooms, creating a significant instability across both pedagogical and andragogical frameworks. While AI tools make production easier and lower the barriers to visualisation, creative processes tend to collapse by acting as a catalyst for premature idea synthesis [9]. This reinforces students' urge to jump immediately into solutions, bypassing the critical, process-focused approach essential to creative thinking. Therefore, the value of exercising critical judgment and iterating refinements, which is essential to the creative design process and practice, is on the verge of becoming diminished.

### 4.5.2 Ethical Uncertainty, Access Inequality, and Shifting Design Skillsets

Beyond these procedural shifts, as design educators, we have observed emerging behaviours, such as students struggling to distinguish when and how to disclose their approaches in accordance with the ethical appropriation of AI. Furthermore, access to AI tools has become a significant concern due to paywall restrictions and high subscription costs, making it hard to ensure equitable access to all students. There is also widespread confusion about which traditional design skills to continue practising, which new design skills to introduce, and how and when to integrate them with AI.

### 4.5.3 Making AI-Supported Design Processes Visible Through Prompt and Iteration Tracking

In group 5, we explored how design and creative education are affected by AI and considered measures to mitigate its negative effects while maximising AI's potential. We discussed ways to observe existing workflows and recognise interaction patterns to inform educational practices. In doing so, we identified that prompt histories and process logs can serve as reflective tools, revealing how the design process evolves by capturing struggles, inspirations, and breakthroughs. Similar to what classroom software like <https://www.khanacademy.org> allows in terms of classroom management and student monitoring, we envision a tool that keeps track of student's design iterations and the prompting that goes into each. This

makes students' AI-supported design processes visible, traceable, and discussable over time. Instead of focusing primarily on final outcomes, the dashboard documents how designs evolve alongside the prompts that informed them, treating prompting as a legitimate and assessable design practice. By linking iterations of a design to specific interactions with AI, the system supports reflection on how ideas emerge, shift, and mature, while enabling instructors to provide targeted feedback on students' prompting strategies and intentional use of AI. At the same time, it offers ways to address attribution and accountability, particularly in collaborative projects, by clarifying individual contributions and encouraging transparent disclosure of AI use.

#### **4.5.4 Re-Centering the Creative Journey Through Process Documentation and AI Scaffolding**

To restore a focus on the creative journey, we further discussed incorporating strategies such as reintroducing design journals, “blue books” to mandate process documentation. This emphasis on process documentation and reflection, both oral and written, can form a core component of evaluation methods and criteria of studio practice. Furthermore, we extended our discussion around scaffolding the use of appropriate AI tools in studio-based learning; for example, by understanding their constraints and capabilities; distinguishing AI as material, tool, and creative environment; and strategically integrating AI-enabled design processes across the curriculum to bridge foundational and emerging practices.

#### **4.5.5 Toward Shared Educational Infrastructure and Sustainable AI Practices**

We also discussed the need to identify the best approaches to develop automated workflows that support evaluation and EduTech development. Our discussions concluded with a proposal to create a platform with educational resources to raise awareness of best practices for AI use in educational contexts. This initiative could evolve into an open forum for educators to discuss emerging issues and engage diverse stakeholders, including educators, students and others, to outline AI usage policies in creative classrooms. Finally, this effort seeks to find a collective solution and to design a generative toolkit to foster sustainable appropriation of AI in creative and design education.

#### **4.5.6 Strategic AI Containment in Design Education**

Alongside efforts to integrate AI meaningfully into design education, we identified the need for deliberate containment strategies that protect core aspects of reflective and critical design practice. Especially in the context of studio-based learning, this includes intentionally reintroducing or strengthening assessment formats that resist full AI delegation, such as handwritten or in-class examinations, oral exams, live design critiques, and process-focused design journals. These approaches do not reject AI outright, but instead create pedagogical moments where students must articulate intent, judgment, and decision-making without relying on automated generation. By selectively constraining AI use, educators can counteract tendencies toward premature solution synthesis and ensure that foundational skills, such as critical reflection, reasoning, and verbalisation of design choices, remain central to learning outcomes. Framed in this way, AI containment can become an active instructional strategy that encourages slowing down the AI-fueled design process and adds reflective depth.

## 5 Performance

### 5.1 The Agents

*Dave Murray-Rust (TU Delft, NL), Joseph Lindley (Lancaster University, GB), Philippe Pasquier (Simon Fraser University - Surrey, CA), and Courtney Reed (Loughbourogh University London, GB)*

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© Dave Murray-Rust, Joseph Lindley, Philippe Pasquier, and Courtney Reed

**URL** <https://vimeo.com/1136322919/7df2f6e7a5?share=copy&fl=sv&fe=ci>

Creativity and improvisation go hand in hand. How better to think about creativity than through improvisational practice? This performance brought together four members of the Dagstuhl seminar with their own individual improvising practices in an ad-hoc multimedia exploration of inter-agencies between humans and technologies. Dave Murray-Rust uses the laptop as an instrument, delegating micro-decisions to algorithmic processes while the musical shaping stays with fingertip controls. Philippe Pasquier marshals collections of musical agents to work with and against musical impulses, inhabiting a space between conducting and performing, and layering drones using the Kenaxis live software. Courtney Reed starts with the expressive range and power of operatic voice, then dives into a sea of electronic alterations and additions. Joe Lindley works visually, using realtime input to shape a stream of computational imagery through increasingly abstracted yet coherent dreamlike terrains. Performing for the first time, without rehearsal, they created the piece here as an example of lived practice within the discursive frame of the seminar.

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