

CoPDA2026: Exploring the Relationship between EUD, AI-Assisted Development, and Meta-Design

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Abstract

This workshop investigates how Cultures of Participation, End-User Development, and Meta-Design are evolving in the era of AI-based systems. While Large Language Models and co-piloting approaches are transforming development into a more accessible and creative activity, they also introduce challenges related to agency, transparency, ethics, and sustainability. Aligned with the AVI 2026 theme “Interactive Creativity: Agencies, Interfaces, and Ethics”, CoPDA2026 wants to explore how AI-augmented participation can support creativity, learning, and collaboration while addressing risks such as overreliance and opacity. The goal is to foster discussion and define research directions for responsible and empowering AI-enabled socio-technical systems.

CCS Concepts

• **Human-centered computing** → **Human computer interaction (HCI)**.

Keywords

Meta-Design, End-User Development, AI-Assisted Development, Symbiotic AI, Cultures of Participation

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1 Introduction

CoPDA2026 is the 10th edition of the series of workshops on Cultures of Participation in the Digital Age (see Figure 1). A detailed description of all the workshops and the contributions can be found at <https://copda.unibs.it/>.

This edition of CoPDA aligns with the 2026 AVI’s main theme “Interactive Creativity: Agencies, Interfaces, and Ethics” by investigating how End-User Development (EUD), Meta-Design, and Cultures of Participation could and should evolve in the Artificial Intelligence (AI) era. With a focus on socio-technical system design and interactivity, the workshop aims to identify the unique promises and pitfalls of AI for rethinking and reinventing learning, work, and collaboration in the AI age. The 4Cs (*critical thinking, creativity, collaboration, communication*) will be discussed and critically evaluated as 21st-century skills required to cope with the wicked problems and the design trade-offs that our world faces regarding agency, interfaces, and ethics.

2 Workshop Theme

Meta-design promotes the creation of socio-technical environments that can evolve in the users’ hands [6, 7]. From a technical perspective, meta-design has traditionally involved variable participation and learning effort from end users, fostering different types of EUD [10] activities related to software programming [3].

The recent role that AI technologies are playing in system design and development, mainly with co-piloting and vibe coding, promises to transform EUD into a more spontaneous, creative, and inclusive activity with a wide range of applications. However, several issues affect AI-assisted development, including sustainability, unpredictability, overreliance, and scalability (to name a few) [2, 4, 8]. Potential harms and damages caused by AI-based technologies must be minimized. At the same time, given the possibility of errors or hallucinations, there must be interaction paradigms that inform humans about the processes that generate outputs (e.g., explanations), providing an overall vision of the context that allows them to make informed decisions.

Recent advances in AI-assisted systems highlight the need to combine grounding mechanisms, such as Retrieval-Augmented Generation, with interaction paradigms that ensure transparency, feedback, and user control, in line with established Human–AI interaction guidelines and broader Human-Centered AI principles [1, 9, 11].

Symbiotic AI (SAI), an emerging perspective and specialization of distributed cognition, is a further proposal that foresees the synergistic possibilities of AI and humans collaborating and improving over time as they learn from each other [5]. This can be achieved by empowering humans to leverage the capabilities of modern AI



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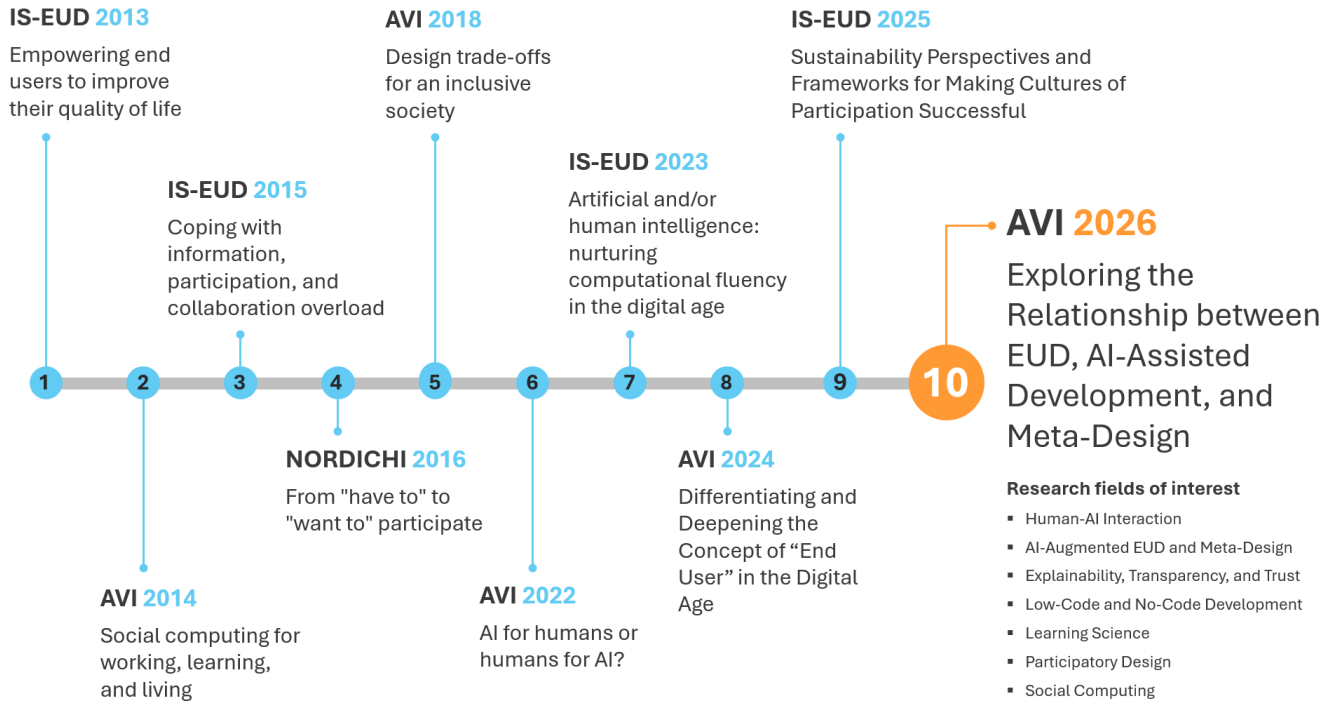


Figure 1: The CoPDA workshop series (2013 - 2026): each of the 10 editions is linked to the conference that hosted the workshops and to the key theme.

systems, such as Large Language Models, and, at the same time, by having humans engaged in EUD and meta-design that improve the computational components.

This workshop aims to provide a reflection on meta-design and EUD in light of recent technological advancements, which may help define a research agenda that can assist designers in addressing the technical and ethical risks associated with AI-assisted development. The proposed frameworks to be further developed by the workshop should promote and support stakeholders to maintain agency and transparency while shaping generative systems that align with their cognitive and ethical goals. By addressing the cognitive and ethical dimensions of AI-assisted development (including configurable transparency, human-in-the-loop validation, and meta-design scaffolding), design choices will be explored to mitigate the potential pitfalls of information overload, overreliance, and deskilling.

3 Workshop Topics

This edition of the CoPDA workshop sought contributions from researchers and practitioners across diverse backgrounds and communities, including designers and users of socio-technical environments, AI researchers, learning scientists, and educators, to address the following key issues:

- Focus on Wicked Problems (without right or wrong solutions) and Design Trade-Offs
- Ecosystems for the Integration of Learning, Working, and Collaboration

- 21st Century Skills: Critical thinking, Creativity, Collaboration, Communication
- Symbiotic AI
- AI-Augmented End-User Development and Meta-Design
- Generative AI for Cognitive Empowerment and Lifelong Learning
- Configurable Transparency and Human-in-the-Loop AI Systems
- Adaptive, Adaptable, and Context-Aware Interfaces
- Diversity, Equity, and Inclusion
- Interactive Creativity in Education
- Vibe Coding
- Responsible Design
- Diversity, Equity, and Inclusion

4 Accepted Papers

Eleven papers have been accepted to CoPDA2026. The abstracts of all accepted papers are summarized in what follows.

• A Human-Centred Framework for Retrieval-Grounded Cold-Start Recommendation

Authors: Stefano Valtolina (Università degli Studi di Milano), Ricardo Anibal Matamoros (Social Things S.r.l.), Francesco Epifania (Social Things S.r.l.)

This paper reframes cold-start recommendation as a knowledge orchestration problem and proposes a human-centered, LLM-based framework that leverages natural language input,

retrieval grounding, and interactive refinement to improve recommendation quality and transparency from first use.

- **A Pilot Study to Evaluate Success Criteria for Symbiotic AI**

Authors: Miriana Calvano (University of Bari), Antonio Curci (University of Bari, University of Pisa), Paloma Diaz (Universidad Carlos III de Madrid), Rosa Lanzilotti (University of Bari), Antonio Piccinno (University of Bari)

This paper proposes and preliminarily validates a set of Success Criteria for evaluating Symbiotic AI systems, showing their potential while highlighting challenges in effectively assessing them in user studies.

- **Co-Design to Meta-Design in Oncology Caregiving: Enabling End-User Development of an AI Mental Health Support System**

Authors: Chizoba Agwaonye (University of West London), Neda Azarmehr (The University of Sheffield)

This paper explores how participatory co-design with oncology caregivers can inform the development of adaptable AI mental health support systems that enable end-user development and allow users to shape and personalize support over time.

- **Design Requirements for Value-Critical Systems**

Authors: Marc Herrmann (Leibniz University Hannover), Elisa Schmid (Leibniz University Hannover), Michael Mircea (Leibniz University Hannover), Kurt Schneider (Leibniz University Hannover)

This paper identifies limitations in existing approaches to the integration of stakeholder values into software systems and proposes five design requirements to enable their explicit, measurable, and adaptive operationalization throughout the system lifecycle.

- **Designing an LLM-based Assistant for Speech Therapists: the Case of e-SpeechT**

Authors: Miriana Calvano (University of Bari), Antonio Curci (University of Bari, University of Pisa), Antonio Piccinno (University of Bari), Alfonso Pio Pretorino (University of Bari)

This paper explores the integration of an LLM-based assistant into a speech therapy platform to support therapists in generating and sharing exercises, demonstrating how prompt engineering can enable reliable outputs while fostering EUD and cultures of participation.

- **Do Ambiguous Prompts Lead to Risky Behavior? Insights from a Home Automation Study with Individuals with Intellectual Disabilities**

Authors: Margherita Andrao (Fondazione Bruno Kessler), Diego

Morra (Massachusetts Institute of Technology), Gianluca Schiavo (Fondazione Bruno Kessler)

This paper shows that while LLMs enable end-user programming through natural language, they can generate unsafe code in home automation contexts, highlighting the need for safety validation mechanisms for non-expert users with intellectual disabilities.

- **Enabling Intelligent User Control in AI-Driven Recommender Systems**

Author: Shin'ichi Konomi (Kyushu University)

This paper highlights the need for intelligent mechanisms and interfaces to support user controllability in AI-driven recommender systems, emphasizing regulation at a meta level and enhanced interactive user control.

- **Generative AI-Augmented End-User Development of Creative Physical Computing Projects**

Authors: Monica Maceli (Pratt Institute School of Information), Haoxiang Zhang (Pratt Institute School of Information)

This paper investigates how generative AI tools support students in ideation, prototyping, and debugging in physical computing, examining their impact on design processes, problem-solving, and perceptions of creative ownership in EUD contexts.

- **Hybrid Human-AI Socio-Technical Environments in the Digital Age**

Author: Gerhard Fischer (University of Colorado)

This paper argues that addressing the gap between using and shaping AI systems requires shifting from problem solving to problem framing and introducing “Substrate Accountability” to preserve human agency in socio-technical environments built on opaque LLM infrastructures.

- **Talking with Cody: How Middle School Students Enact AI as a Tool, Conversational Partner, and Tutee in Mathematics Programming Activities**

Authors: Anders Mørch (University of Oslo), Marianne Eidsaune Andersen (University of Oslo), Henrik Tjønn (University of Oslo)

This paper investigates how students use a conversational AI in programming-based mathematics activities, highlighting its function as a form of end-user development in the classroom.

- **Who Holds the Agency? Meta-Design in the Age of Generative AI**

Authors: Daniela Fogli (Università degli Studi di Brescia), Luigi Gargioni (Università degli Studi di Brescia), Davide Guizzardi (Università degli Studi di Brescia)

This paper presents a meta-design approach to AI-assisted EUD in healthcare, introducing an LLM-based conversational system that enables caregivers to create and adapt therapy plans while ensuring transparency, safety, and human agency.

5 Program Committee

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Gerhard Fischer is a Professor Emeritus of Computer Science, a Fellow of the Institute of Cognitive Science, and the Director of the Center for Lifelong Learning and Design (L3D) at the University of Colorado at Boulder. His recent work is centered on quality of life in the digital age, social creativity, meta-design, cultures of participation, design trade-offs, and rich landscapes for learning.

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Declaration on Generative AI

During the preparation of this work, the authors used Grammarly and ChatGPT for text revision, paraphrasing, rewording, grammar, and spelling checks. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the publication's content.

References

- [1] Saleema Amershi, Dan Weld, Mihaela Vorvoreanu, Adam Fourney, Besmira Nushi, Penny Collisson, Jina Suh, Shamsi Iqbal, Paul N. Bennett, Kori Inkpen, Jaime Teevan, Ruth Kikin-Gil, and Eric Horvitz. 2019. Guidelines for Human-AI Interaction. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, Scotland UK) (CHI '19). Association for Computing Machinery, New York, NY, USA, 1–13. doi:10.1145/3290605.3300233
- [2] Giacomo Amore and Andrea Gentili. 2025. AI and climate: an ethical sustainability framework for balancing risks and responsibilities. *AI & Society* (2025), 1–11. doi:10.1007/s00146-025-02615-0
- [3] Barbara Rita Barricelli, Gerhard Fischer, Daniela Fogli, Anders Mørch, Antonio Piccinno, and Stefano Valtolina. 2024. Advancing the integration of artificial intelligence in meta-design. In *Proceedings of the 2024 International Conference on Advanced Visual Interfaces*. ACM Press, New York, USA, 1–5.
- [4] Yoshua Bengio, Geoffrey Hinton, Andrew Yao, Dawn Song, Pieter Abbeel, Trevor Darrell, Yuval Noah Harari, Ya-Qin Zhang, Lan Xue, Shai Shalev-Shwartz, Gillian Hadfield, Jeff Clune, Tegan Maharaj, Frank Hutter, Atılım Güneş Baydin, Sheila McIlraith, Qiqi Gao, Ashwin Acharya, David Krueger, Anca Dragan, Philip Torr, Stuart Russell, Daniel Kahneman, Jan Brauner, and Sören Mindermann. 2024. Managing extreme AI risks amid rapid progress. *Science* 384, 6698 (2024), 842–845. doi:10.1126/science.adn0117
- [5] M. Calvano, A. Curci, G. Desolda, et al. 2026. Building Symbiotic Artificial Intelligence: Reviewing the AI Act for a Human-Centred, Principle-Based Framework. *Minds & Machines* 36, 1 (2026). doi:10.1007/s11023-025-09753-w
- [6] Gerhard Fischer, Daniela Fogli, and Antonio Piccinno. 2017. Revisiting and Broadening the Meta-Design Framework for End-User Development. In *New Perspectives in End-User Development*. Springer, Cham, Switzerland, 61–97.
- [7] Gerhard Fischer and Elisa Giaccardi. 2006. Meta-design: A Framework for the Future of End-User Development. In *End User Development*, Henry Lieberman, Fabio Paternò, and Volker Wulf (Eds.). Springer Netherlands, Dordrecht, 427–457. doi:10.1007/1-4020-5386-X_19
- [8] Artur Klingbeil, Cassandra Grützner, and Philipp Schreck. 2024. Trust and reliance on AI — An experimental study on the extent and costs of overreliance on AI. *Computers in Human Behavior* 160 (2024), 108352. doi:10.1016/j.chb.2024.108352
- [9] Patrick Lewis, Ethan Perez, Aleksandra Piktus, Fabio Petroni, Vladimir Karpukhin, Naman Goyal, Heinrich Küttler, Mike Lewis, Wen-tau Yih, Tim Rocktäschel, Sebastian Riedel, and Douwe Kiela. 2020. Retrieval-augmented generation for knowledge-intensive NLP tasks. In *Proceedings of the 34th International Conference on Neural Information Processing Systems* (Vancouver, BC, Canada) (NIPS '20). Curran Associates Inc., Red Hook, NY, USA, Article 793, 16 pages.
- [10] Henry Lieberman, Fabio Paternò, Markus Klann, and Volker Wulf. 2006. End-User Development: An Emerging Paradigm. In *End User Development*, Henry Lieberman, Fabio Paternò, and Volker Wulf (Eds.). Vol. 9. Springer Netherlands, Dordrecht, 1–8. doi:10.1007/1-4020-5386-X_1 Series Title: Human-Computer Interaction Series.
- [11] Ben Shneiderman. 2020. Human-Centered Artificial Intelligence: Reliable, Safe & Trustworthy. *International Journal of Human-Computer Interaction* 36, 6 (2020), 495–504. doi:10.1080/10447318.2020.1741118