

International Workshop on Reality Mediation: Personalized, Shared, and Connected Realities

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Abstract

Recent advances in AI, XR, multimodal sensing, wearable interfaces, and cyber-physical infrastructures are expanding the role of Ubiquitous Computing from supporting everyday activities to shaping how people perceive, interpret, and discuss about the world around them. These systems can enable accessibility, learning, mobility, collaboration, and public-space interaction at unprecedented personalization levels, but they may also fragment shared understanding, create asymmetries, and raise concerns around manipulation, privacy, safety, accountability, and trust. This workshop introduces reality mediation as a unifying lens for these emerging challenges. It brings together researchers from across UbiComp's contributing disciplines, including but not limited to HCI, XR, AI, urban computing, mobility, cyber-physical systems, and trustworthy computing, to discuss how personalized and mediated experiences can remain intelligible, shareable, and societally grounded. The workshop aims to develop concepts, design principles, evaluation methods, and research questions for future ubiquitous computing systems that are not only adaptive and intelligent, but also supportive of shared understanding, towards ubiquitous technology that increases societal cohesion rather than undermining it.

CCS Concepts

• **Human-centered computing** → **Collaborative interaction**.

Keywords

reality mediation, personalization, shared reality, XR, trust

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1 Topic, Rationale, and Objectives

Ubiquitous Computing researchers have long explored how computation can be embedded into everyday environments, artifacts, bodies, and activities. As these systems become increasingly connected—with ubiquitous connectivity, AI, XR, multimodal sensing, wearable devices, and cyber-physical infrastructures reducing friction more and more—they are also beginning to take a more active role in organizing how everyday situations are perceived, interpreted, and acted upon. A navigation system may prioritize certain routes, risks, or opportunities[2]; an XR interface may reveal invisible information about a place or position remote avatars according to local contexts[3]; wearable sensing may relate activity-aware physiological signals to understand mental and physical workload[4]; an AI assistant may translate social or environmental cues into personalized recommendations[8]; and an urban-scale platform may shape how people encounter services, communities, or public information[1].

These developments suggest that a growing part of UbiComp research is about designing the mediation between people and their surrounding realities. We refer to this emerging design space as *reality mediation*. Reality mediation concerns how UbiComp systems sense and transform “objective” reality when creating user experiences, which influences whether those experiences remain understandable, shareable, and trusted across people, devices, places, and intelligent agents. This framing is important because such mediated experiences can be highly beneficial while also socially consequential. Personalized mediation can improve accessibility, reduce cognitive overload, support learning, enable collaboration, and make public environments easier to navigate [6]. At the same time, it can create situations in which different people encounter different versions of the same environment, receive different explanations,



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or gain asymmetric access to information. Such asymmetries may be useful and even necessary, but they also raise questions about common ground, accountability, manipulation, fairness, privacy, safety, and trust [7, 9].

Situated at this critical junction, reality mediation provides a way to connect several research threads that are often discussed separately: adaptive interfaces, XR overlays, edge-networked XR infrastructures [5], (explainable) AI, multimodal sensing, mobility support, digital social prescribing, urban computing, privacy-preserving systems, and trustworthy cyber-physical infrastructures. The workshop asks how these threads can be brought into a common UbiComp agenda, not only as technical mechanisms for personalization, but as systems that shape how lived experience is constructed, shared, and negotiated. Hence, the workshop addresses the following core question: How should ubiquitous systems mediate reality in ways that are valuable for individuals while supporting societal values such as shared understanding, responsible interaction, epistemic diversity, and trust?

The specific objectives of the workshop are sixfold:

- It aims to establish *reality mediation* as a concrete framing for a broad set of emerging UbiComp problems and to define common vocabulary in this domain.
- It seeks to articulate a common conceptual pipeline for discussion: *Sensing* → *Modeling* → *Mediation* → *Personalization* → *Sharing/Connection/Negotiation* → *Trust and Governance* [6].
- It aims to identify design principles for systems that mediate reality responsibly and that consider intelligibility, transparency, user control, provenance, privacy protection, fairness, bystander awareness, safety, and security.
- It uses UbiComp as an umbrella to integrate and bridge communities, including HCI, XR, AI, urban computing, mobility, cyber-physical systems, and trustworthy computing.
- It aims to surface methodological questions, such as how to evaluate mediated experience, common ground, asymmetry, and long-term social impact in real-world deployments.
- It aims to build a forward-looking research agenda for UbiComp systems that are not only adaptive and intelligent, but also socially grounded and capable of supporting mutual understanding in real-world environments.

The workshop welcomes work on, but is not limited to, the following themes: reality mediation in ubiquitous computing systems; personalized, shared, and connected realities; multimodal sensing for people, places, activities, and situations; adaptive mediation through XR, wearable, and ambient interfaces; systems for connecting individualized perspectives across users or groups; social context modeling and support for mutual understanding; explainability and intelligibility of mediated experiences; privacy-preserving, secure, and accountable mediation; mobility, public-space, and urban-scale mediated experience; AI agents and infrastructure that shape everyday interpretation and coordination; and long-term in-the-wild evaluation of mediated and socially embedded systems.

We argue that this workshop should be part of UbiComp/ISWC 2026 because it addresses a growing class of systems that are central to the field: systems that sense, infer, adapt, and increasingly shape how people experience and interpret the world around them. It will

make an impact by creating a shared venue across technical, design, and governance perspectives, helping researchers develop common vocabulary, common research questions, and a clearer agenda for future work. It also offers a timely bridge between communities that frequently cite similar challenges but rarely discuss them together in one room. In particular, the workshop is positioned to connect work that would otherwise be split across several disciplines that traditionally contribute to UbiComp but do not have a common forum to discuss reality mediation—this is timely and relevant since many researchers in these fields are today grappling with closely related questions about mediation, information asymmetry, explanation, and control. We expect the workshop to help the community move from scattered examples toward a more coherent discussion of abstractions, evaluation methods, and design principles for systems that increasingly mediate lived experience.

2 Expected Attendance, Participation and Post-workshop follow-up

We expect the workshop to attract approximately 25 participants. This size is large enough to ensure diversity of perspectives while still allowing interactive discussion, breakout activities, and agenda-building exercises.

The workshop will be run as an **open workshop**. Participation will not be limited to accepted authors. In addition to presenters of accepted workshop papers, conference attendees who are interested in the topic will be welcome to attend and participate in the discussions. We choose an open format because the topic is emerging, cross-cutting, and likely to benefit from broad community participation rather than a narrow closed cohort. An open format will also help the workshop function as a community-building event, allowing UbiComp attendees from adjacent areas to join discussions even if they did not submit a paper.

We expect participation from researchers working on ubiquitous and adaptive systems, multimodal AI and behavioral modeling, XR and mediated interaction, explainable and human-centered AI, embedded and cyber-physical systems, mobility and transportation systems, urban and community computing, and privacy, security, fairness, and trustworthy computing. We also expect interest from researchers who work on collaboration, accessibility, public-space technologies, and socio-technical system design, since many of these systems increasingly mediate what users notice, understand, and share. Participation from both technical and human-centered researchers is important because the core challenge is not only building stronger mediation mechanisms, but also understanding when such mediation is useful, when it becomes harmful, and how control and accountability should be distributed among users, operators, and surrounding stakeholders.

After the workshop, we will publish the workshop website with the final program and accepted papers, share a short public summary of the discussion outcomes, and explore follow-up outputs such as a community report, a future workshop edition, or other collaborative dissemination activities. We also plan to maintain contact among interested participants after the event in order to support continued exchange and possible joint initiatives.

The intended outcome is not only a successful one-time event, but also the creation of a durable cross-community conversation

around reality mediation. We believe the workshop can help define a more stable vocabulary and research agenda for this topic, which is currently spread across multiple venues and terminologies. More concretely, we expect the workshop to yield a set of recurring questions that can inform future CFPs, special issues, panel discussions, and collaborations. Examples include how common ground should be operationalized, how mediated asymmetry should be represented and communicated, and how trust and override should be designed into AI- and XR-enabled ubiquitous systems.

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A Appendix: Call for Papers

International Workshop on Reality Mediation: Personalized, Shared, and Connected Realities

Overview

Ubiquitous computing is no longer only about sensing context and adapting services. As AI, XR, multimodal sensing, wearable and ambient interfaces, and cyber-physical infrastructures become embedded in everyday environments, computational systems increasingly influence what people notice, how situations are interpreted, and how places, services, information, and other people are encountered. A navigation system may foreground some routes, risks, or opportunities over others; an XR interface may reveal invisible layers of a place; a wearable system may infer bodily or emotional states; and an AI-enabled public-space service may personalize

which information, communities, or actions become visible to each person.

These developments create major opportunities for accessibility, learning, mobility, collaboration, health, public-space interaction, and civic participation. At the same time, they raise a deeper question for the UbiComp community: when systems personalize and transform everyday experience, how can these experiences remain understandable, shareable, accountable, and trustworthy across different people, devices, places, and intelligent agents?

This workshop introduces *reality mediation* as a unifying lens for this emerging design space. By reality mediation, we refer to the ways ubiquitous systems sense, model, transform, personalize, share, connect, and govern people's experiences of the world. The workshop aims to move beyond isolated examples of personalization or adaptation and toward a broader discussion of how mediated realities can be designed responsibly: not only to support individuals, but also to preserve common ground, enable negotiation across perspectives, and sustain trustworthy social interaction.

We invite researchers and practitioners from UbiComp, ISWC, HCI, XR, AI, IoT, cyber-physical systems, urban computing, mobility, accessibility, privacy, security, fairness, and trustworthy computing to join this conversation. We welcome technical, conceptual, empirical, critical, and design-oriented contributions, including early-stage work that can stimulate discussion and help shape a shared research agenda.

Workshop Goals

The workshop aims to establish reality mediation as a concrete research agenda for UbiComp/ISWC. In particular, we seek to:

- develop a shared vocabulary for discussing how ubiquitous systems mediate people's lived experiences;
- connect research on sensing, modeling, mediation, personalization, sharing, negotiation, trust, and governance;
- identify design principles for intelligible, transparent, controllable, privacy-preserving, fair, safe, and accountable mediation;
- discuss methods for evaluating mediated experiences, including common ground, asymmetry, trust, and long-term social impact;
- bridge communities that often study related problems separately, including HCI, XR, AI, urban computing, mobility, cyber-physical systems, and trustworthy computing; and
- build a forward-looking agenda for ubiquitous systems that are adaptive and intelligent while remaining socially grounded.

Topics of Interest

Topics include, but are not limited to:

- theories, concepts, and design frameworks for reality mediation;
- personalized, shared, connected, collaborative, or negotiated realities;
- multimodal sensing and modeling of people, places, activities, bodies, situations, and social contexts;
- XR, wearable, mobile, robotic, and ambient interfaces that mediate everyday perception and action;

- AI agents and foundation-model-based systems that shape interpretation, recommendation, coordination, or decision-making in everyday environments;
- systems that connect individualized perspectives across people, groups, communities, or stakeholders;
- public-space, urban-scale, mobility, transportation, and community systems under personalized mediation;
- digital social prescribing and community referral systems that mediate access to health, well-being, and local support resources;
- accessibility, inclusion, learning, health, well-being, collaboration, and civic participation enabled by mediated experiences;
- explainability, intelligibility, transparency, provenance, and user control in mediated ubiquitous systems;
- privacy-preserving, secure, safe, and accountable architectures for mediation across edge, cloud, federated, and cyber-physical infrastructures;
- fairness, plural values, bystander concerns, governance, policy, and responsible innovation in personalized or mediated realities;
- empirical, in-the-wild, longitudinal, and participatory methods for evaluating mediated experience and social impact;
- critical reflections on perceptual fragmentation, asymmetric access, manipulation, over-personalization, filter bubbles, or loss of common ground; and
- position papers that identify open challenges, research opportunities, or future directions for reality mediation.

Submission Types

We invite **4–8 page workshop papers** using the UbiComp/ISWC 2026 template. Submissions may include, but are not limited to:

- original research papers presenting systems, methods, studies, or deployments;
- position papers proposing concepts, arguments, design principles, or research agendas;
- early work, prototypes, or work-in-progress papers that can benefit from workshop discussion;
- empirical or methodological papers on how to study and evaluate mediated experience;
- critical, reflective, or speculative papers on risks, governance, ethics, and societal implications; and
- interdisciplinary papers that connect technical mechanisms with human, social, urban, legal, or policy perspectives.

Submissions do not need to use the term “reality mediation” explicitly. We welcome papers from adjacent areas when they address how ubiquitous, wearable, AI-enabled, XR, or cyber-physical systems shape what people perceive, understand, decide, or share in everyday environments.

Review and Selection

Each submission will receive **at least three reviews**. Papers will be selected based on relevance to the workshop theme, clarity of contribution, originality or insight, and potential to stimulate discussion across communities. Because the workshop is intended as an agenda-building venue rather than a mini-conference, we

especially welcome papers that open important questions, connect previously separate research areas, or articulate design tensions and evaluation challenges.

After acceptance, papers will be grouped into thematic clusters. These clusters will be used to organize short presentations, moderated discussions, and collaborative agenda-building activities during the workshop.

Workshop Format

The workshop will be a **open workshop**. Attendance will not be limited to authors of accepted papers. The program will combine:

- an opening session that frames reality mediation as an emerging UbiComp/ISWC research agenda;
- short presentations of accepted papers, grouped by theme;
- moderated discussions on topics such as common ground, asymmetry, intelligibility, control, accountability, and trust;
- breakout or plenary agenda-building activities to identify open technical, methodological, and socio-technical challenges; and
- a closing synthesis to identify possible follow-up activities, such as a public workshop report, future editions, special issues, panels, or collaborations.

Our goal is to create an interactive venue where participants can connect concepts, methods, and communities. Presentations will therefore be concise, with substantial time reserved for discussion and synthesis.

Intended Outcomes

The workshop aims to produce a shared vocabulary and research agenda for reality mediation. Expected outcomes include: (1) a set of recurring concepts and design tensions, (2) methodological questions for evaluating mediated and personalized experience, (3) connections among researchers working on related topics under different terminology, and (4) follow-up opportunities for community reports, future workshops, panels, special issues, or collaborative research.

Ultimately, the workshop asks how future ubiquitous systems can personalize experience without isolating perception; support individuals without undermining shared understanding; and mediate reality in ways that are beneficial, accountable, and trustworthy for both users and society.

Organizers

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