

WHY?

TOPICS

Hearing amplified

CONTROL  
(BOUNDARIES)

manipulate audience to have a specific experience

Do-lurking

private setting / pulled out

audience ~~pas~~ pauses chats via data

Encourage passive participants to engage in safe

Lurking  
→ bio data

Rehearsed / Unrehearsed

Talk thru biometric trackers

Lie detecting  
Excited

Manipulating Ambiguous data

Asreen Rostami, Stockholm University  
Chiara Rossitto, Stockholm University  
Donald McMillan, Stockholm University  
Jocelyn Spence, University of Nottingham  
Robyn Taylor, Newcastle University  
Jonathan Hook, University of York  
Julie Williamson, University of Glasgow  
Louise Barkhuus, IT University of Copenhagen

# Glimpses of the Future: Designing Fictions for Mixed-Reality Performances

## Insights

- Narratives such as design fictions provide opportunities to address a performance's place in the world beyond the range of producer-consumer roles.
- The role of art in society is important when art bleeds into research, both for the process and the outcomes.
- Satire and role play provide opportunities to smooth interdisciplinary consensus building.

Mixed-reality performances (MRPs) are complex and hybrid artistic experiences that incorporate combinations of live and interactive performance, in which audience and performers interact with technology and digital media in real and virtual worlds [1].

Within the HCI community, performances by Blast Theory and Brendan Walker are examples of technological and performative innovation, providing a site for collaboration between artists, performers, HCI scholars, and interaction designers [1,2]. This interdisciplinarity provides

opportunities for innovation in HCI, even as it poses challenges for the underlying creative processes and their outcomes.

During a one-day workshop at CHI 2017, we generated *visions* of future MRPs. To do this we employed design fiction, a language of visual imagery and narrative (e.g., imaginary storyboards, scripts, vignettes) that is familiar to performance producers. As such, design fictions can act as boundary objects enabling technology designers to communicate creative possibilities in a form familiar to creative practitioners, and vice versa. Moreover, this dialogue provides

opportunities to discuss ethical, sociotechnical, and cultural concerns in a structured and participatory way by situating MRPs in the existing broader sociocultural context, and to address the ethical challenges that might emerge from introducing technologies into these contexts. Fictional framing can encourage playfulness, experimentation, and the consideration of challenging, strange, and otherwise unorthodox uses of technology—which might, in turn, facilitate more creative ideation. Thus, the processes through which MRPs are created and designed, and not just MRPs as final productions, provide opportunities to reflect on views of the world and how it could be.

Both the process of design and the final MRP itself can be directed toward research goals while providing a common framework and language for cross-disciplinary collaboration, without, we hope, overly restricting the artist's creative freedom. We see this facilitation of communication through design fiction as further enabling HCI's "turn to the cultural" [2] and the valuable cross-pollination of ideas between HCI and other fields.

The workshop began with introducing examples of current MRPs and design fiction as a method. Then the 20 participating artists, performers, designers, and researchers came together in three groups with the goal of designing MRPs to explore implications for the future. Participants were asked to introduce themselves by adding a fictive element to their research interests. These fictive elements, along with pre-made theme cards, were used as inputs for the ideation process. The groups adopted three different processes of imagining the future and developing artifacts to highlight the social, performative, and ethical aspects of the performances they envisaged. Here, we introduce the outcome of

each group as a way to discuss the broader challenges connected to adopting design fiction as a method to explore, design, and deploy MRPs.

### PERFORMING PUBLIC FICTIONS: "NO, OFFICER, IT'S JUST A DESIGN FICTION"

The first fiction was designed as a 360-degree video, which was an opportunity to explore how a short performance recorded in this medium could develop into a design fiction. Performing a fiction in 360 degrees allowed an exploration of how different actors and actions could be distributed around the scene, different ways the viewer could be addressed and directed, and how we could develop simultaneous narratives that interacted as the fiction unfolded.

The ideas were initially practical and functional: employing digital micropayments for tips in a cashless society; finding busy locations where street performers could set up, based on pedestrian traffic data; and matching performers with particular musical styles to the preferences of users passing by. The main technology envisioned was Buskr, a local government-commissioned app that would help street performers play just the right music, in just the right places, at just the right times. The design fiction did not seek to develop a detailed design of the technological service, but rather to consider how these ideas would influence and be influenced by the future world in which they would be situated.

To get at these deeper issues, the discussion focused on how such services would reveal tensions between the different stakeholders. For example, a council's well-meaning attempt to shield buskers from the risks of working with cash would prevent performers without bank accounts from being paid; and a less well-meaning busker could use their

tech savvy to steal an established busker's spot.

The performance recorded in 360-degree video incorporated these stakeholders and drew attention to problematic consequences that might arise from applying technology to the complex ecosystem of a city's street-performance scene.

This fictional performance starred an unreflective council bureaucrat, a young busker enthusiastic to embrace technology, another busker who was not willing or capable of doing so, and audience members with differing views on the app. Through multiple trials performing this fiction, a plot was developed based on a confrontation between two buskers using the app, which occurred alongside a television interview with a council leader about its benefits.

The characters in this fiction offered a powerful mechanism to discover and then represent the different perspectives from which a technology would be received, understood, and valued. Rather than a means to envision novel MRPs, performing the fiction in 360 degrees facilitated the simultaneous role playing of the tensions and conflicts among stakeholders.

Finally, the choice to perform the fiction under a prominent landmark (the Denver Blue Bear) caused a curious crowd to gather, mostly because of the confrontation evident in the plot. This raised subsequent reflections on the consequences of bringing an unwitting public audience into a design fiction performance [3]. *Would the audience's reactions to the representation of the design concept and its envisioned consequences provide further insight and fuel for discourse?* One audience member, for example, was an officer who required assurance that the altercation he witnessed was not going to continue inside the conference venue before he would allow the group to return to the workshop.

### PRODUCTS, PROBLEMS, AND PUNS

The second fiction was particularly focused on the physicality of MRPs and how they can capitalize on sensation and movement in future scenarios. Internal data tracking, data as a material, dance performance, and ethics were starting points and

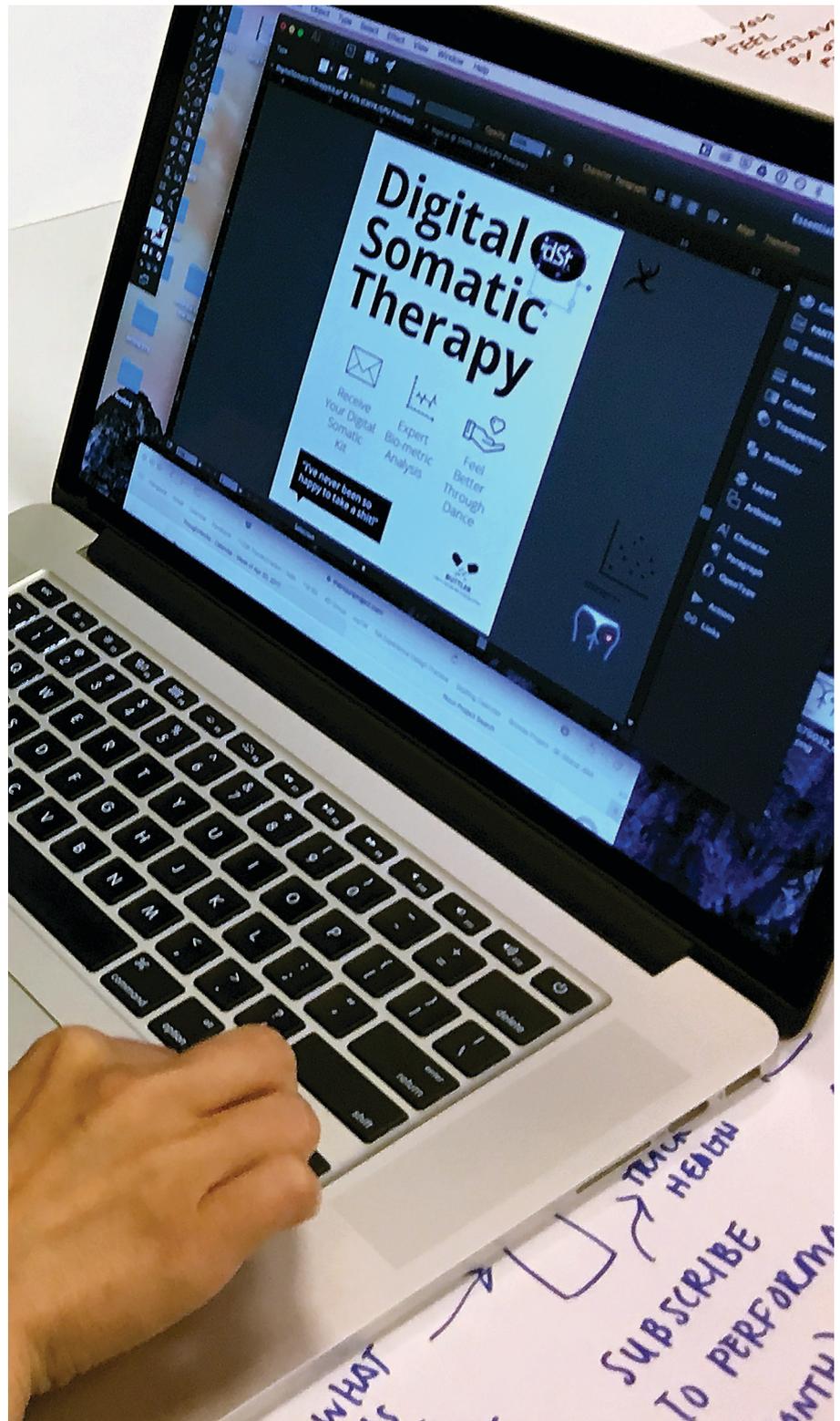
---

**The design-fiction orientation provided a freedom to go over the top in terms of what would be permissible in everyday contexts, allowing us to explore the performance with clarity and hilarity.**

constraints to envision a performance event that would involve digital technologies in a highly physical encounter.

The group focused on the instructions to create ephemera resulting from the performance rather than a detailed plan for the performance itself. This helped them to stop fixating on the specific technologies to be used in the performance and instead think more clearly about the nature of the desired performative interaction. The decision to include ethics as a focus helped enormously. While creating the fiction, attention was drawn to the possible conflicts between performers and audiences resulting from a violation of ethics through the use and abuse of data during or after a performance. This resulted in a shift of the discussion toward imagining a more complex and interwoven relationship between audiences and performers outside the bounds of traditional performance settings. What unlocked the imagination was thus a shift in focus away from the mechanics of the MRP—technical, organizational, or ethical—and toward the design fiction that created the world in which the performance would be situated.

This vaguely imagined, ethically contested performance was set as a future service, productizing art and performance without the constraints of current technology or market forces. Because the technologies for the performance did not need to be operative today—much less practical or affordable—*potential* fictions could be developed. The group shifted between satirizing the app economy and the perceived value of artists and performers, and designing a somaesthetic dance-based wellness service. Laughter bellowed across the room as the group excitedly built on one another's ideas. The design-fiction orientation provided a freedom to go over the top in terms of what would be permissible in everyday contexts, allowing us to explore the performance, and the resulting ethical complications, with clarity and hilarity. Setting the idea of this fictional performance and its ramifications over the course of decades made it possible to scaffold the performance and explore its consequences.



The final concept was of a future service in which people could sign up to have their well-being tracked and have a specially trained dancer sent to dance with them when they reached a personal low point. Particular dance techniques would assist with different types of distress, leveraging the skill of the performers and the insights mined from the data. However, the

fiction also had a more critical stance as it imagined the class-action lawsuit that would arise over a decade later, when the dancers realized that their new profession prevented them from maintaining or managing their own well-being. As such, it addressed how the current social issues of disruption in the labor market due to technology could become a practical



ACM TSAS is a new scholarly journal that publishes high-quality papers on all aspects of spatial algorithms and systems and closely related disciplines. It has a multi-disciplinary perspective spanning a large number of areas where spatial data is manipulated or visualized.

The journal is committed to the timely dissemination of research results in the area of spatial algorithms and systems.



For further information  
or to submit your  
manuscript,  
visit [tsas.acm.org](http://tsas.acm.org)

concern for future MRPs: *Could MRP and design fiction help us preempt the negative consequences of increased on-demand labor applications with little or no protection for the workforce, characterized by contemporary service companies such as Uber or TaskRabbit?*

### FICTIONAL ETHICS AND ETHICAL FICTIONS

The third fiction was inspired by one participant's recent forays into the performance of magic and illusion. This fiction was designed and presented as a poster for deceptive performances (magic and fortune-telling), focusing on the ethical implications of embedding technology in the varied and complex social backgrounds of these practices.

The group was intrigued by the challenges of learning and perfecting the skills of stage magic, as well as an interest in the practice of fortune-telling. The fortune-teller begins with broad statements, carefully observing the nuances of a client's response and progressively narrowing and specifying his or her reading in response to the client's reactions. Indications of a client's agreement, nervousness, or rejection of an avenue of discussion can be interpreted by a skilled fortune-teller as "cold tells" that reveal information useful in crafting a compelling reading. In contrast, in the practice of "hot reading," practitioners discover information about the client in advance in order to flesh out their reading with specific details that reinforce the client's faith in their apparent psychic abilities.

Our focus on the more culturally and ethically charged practice of fortune-telling raised several discussions around the incorporation of technology into these performances. The first discussion was around how biofeedback could be incorporated into a cold

reading, enabling the practitioner to gauge the client's physical arousal (nervousness, enthusiasm, fear, etc.) in response to the unfolding discussion. This design was followed by the exploration of the possible uses of social media data mining for conducting hot readings in which personal information about the client could already be known to the practitioner. The design of this part of the fiction could be made possible, for instance, by the client's purchase of a digital ticket, which would make different sorts of digital footprints available for the fortune-telling.

At this point the discussion shifted toward the ethical considerations of designing for these practices. Cold reading relies on impressive skills of observation and social awareness, and it was easy to imagine technology integrating well into this practice. However, the group's perception of hot reading associated it more closely with trickery and manipulation rather than with a set of skillful practices developed over time. Moreover, the prospect of augmenting readings with data mined from social media seemed somewhat unsavory and dishonest. The design work in creating a poster that would embody the main ideas of these two sides of fictional augmented fortune-telling opened a broader debate about the ethics of deception and the narrative and meanings the poster would convey. This provided an opportunity to discuss the ethics of stage magic (in which trickery and illusion are used to enhance the performative qualities of the participant experience) and its relationship to the beliefs and customs practiced by fortune-tellers, practitioners who authenticate their credibility through generations of ancestry and tradition. While integrating digital technology into stage magic

**Design fiction is a means of considering the future, and for MRPs it can help us move beyond the usual concerns of enabling audience participation or exploring novel technologies.**

could (and perhaps does) result in innovative performative practices, our group became uncomfortable with the possible ethical implications that a fictive digital intervention could convey about the practice of fortune-telling: *Would this imaginary use of digital technology for augmentation of staged magical performances unfairly associate traditional practices with dishonesty? Was the idea misappropriating a culture or dismissing its authenticity in an unintended way? What type of representations of our intended users of technology were we creating?*

## DESIGNING FICTIONS FOR MIXED-REALITY PERFORMANCES

Design fiction is becoming a popular methodology within HCI [4,5], so it is important that we consider the potential impact of fictions on the type of knowledge they create and the discourse they foster. Design fiction is a means of considering the future, and for MRPs it can help us move beyond the usual concerns of enabling audience participation or exploring novel technologies.

The different fictions compelled us to consider experiences in a holistic and longitudinal fashion for different audiences, performers, and other cohorts (such as service providers, shareholders, or law firms). In doing so, the varied knowledge and experience of our participants was invaluable. The production of the 360-degree video allowed each participant, through a “clashing through dialogue,” to express themselves in character from a perspective that they understood without the excessive onus on mutual understanding and shared vocabulary that can stall interdisciplinary design work. In the other groups, splitting and expanding the stakeholders also allowed the need for mutual understanding of a position to be lessened and to be replaced by assurances that this group or viewpoint was understood by the person making the stand. Employing satire also encouraged insider knowledge of the social, cultural, and political lives of different groups to be shared, often leveraging misunderstandings for comic effect

and in turn moving the group closer to a shared understanding.

During the design of the fictions, the more artistic qualities of performances (choreography, acting, directing, etc.) were not explored or reported in as much detail as we expected at the outset. The framing of design fiction shifted the focus to the world around the performances and the artifacts from that world that would best demonstrate what each group found exciting about their performance’s place in that world. The time constraints of a one-day workshop influenced the fidelity of the performance envisaged, the world it inhabited, and the artifact created—exploring in detail any one of the three parts of the design fiction would be difficult in a single day for a newly minted team, let alone all three. Scaffolding the activity further could have allowed for more time and focus on the performative aspects. Having every team produce a page of a newspaper insert or setting all performances in Manhattan in 2025 with a description borrowed from a short story were options discussed for the workshop. In hindsight such constraints on the creativity of the teams may have produced more focused—if perhaps less socially aware—fictions.

The topic of MRP had a palpable influence on how the design fictions were undertaken. Focusing on technology specifically within performance as part of the design process forces designers to take account of fiction and the role of art in wider society. This shifts the emphasis from the direct societal impact of the technology to the influence that technology can have on art and its audiences. The extra layer of complexity provides both an opportunity, and to some extent an obligation, to incorporate the role of art into the process of designing fictions, and to critically reflect on the *imaginative* future they create [6].

## ACKNOWLEDGMENTS

We thank all the workshop participants for contributing to a very interesting discussion: Alina Striner, Pablo Cesar, Amy Findeiss, Andrew Dow, Joshua McVeigh-Schultz, Luigina

Ciolfi, Christopher Elsdén, Jacqueline Cameron, and Matt Wood. We would like to thank Jarmo Laaksolahti for helping to run the workshop.

---

## ENDNOTES

1. Benford, S. and Giannachi, G. *Performing Mixed Reality*. The MIT Press, Cambridge, MA, 2011.
2. Benford, S., Adams, M., Farr, F., and Tandavanitj, N., and Jennings, K. The ethical implications of HCI’s turn to the cultural. *ACM Transactions on Computer-Human Interaction* 22, 5 (2015), 1–37.
3. Waern, A. The ethics of unaware participation in public interventions. *Proc. of CHI ’16*, 803–814.
4. Lindley, J. and Coulton, P. Pushing the limits of design fiction: The case for fictional research papers. *Proc. of CHI ’16*, 4032–4043.
5. Tanenbaum, J. Design fictional interactions: Why HCI should care about stories. *Interactions* 21, 5 (2014), 22–23; <https://doi.org/10.1145/2648414>
6. Blythe, M. The Hitchhiker’s Guide to Ubicom: Using techniques from literary and critical theory to reframe scientific agendas. *Personal Ubiquitous Comput.* 18, 4 (2014), 795–808.

---

Asreen Rostami is a Ph.D. candidate in HCI at Stockholm University. Her research focuses on interweaving technology with mixed-reality performances.

→ [asreen@dsv.su.se](mailto:asreen@dsv.su.se)

Chiara Rossitto is a senior lecturer in HCI at Stockholm University. Her research focuses on interactive performance as means of civic engagement.

→ [chiara@dsv.su.se](mailto:chiara@dsv.su.se)

Donald McMillan researches the integration of mobile, behavioral, and conversational sensing technology into everyday life at Stockholm University.

→ [donald.mcmillan@dsv.su.se](mailto:donald.mcmillan@dsv.su.se)

Jocelyn Spence’s current research seeks to develop personally meaningful gifting interactions in museum settings.

→ [jocelyn.spence@nottingham.ac.uk](mailto:jocelyn.spence@nottingham.ac.uk)

Robyn Taylor is a researcher and singer exploring issues in HCI surrounding creative agency and social encounters in public spaces.

→ [robyn.taylor@ncl.ac.uk](mailto:robyn.taylor@ncl.ac.uk)

Jonathan Hook is a lecturer and HCI researcher at the University of York.

→ [jonathan.hook@york.ac.uk](mailto:jonathan.hook@york.ac.uk)

Julie Williamson (University of Glasgow) explores how performative interactions can be embedded into public places.

→ [julie.williamson@glasgow.ac.uk](mailto:julie.williamson@glasgow.ac.uk)

Louise Barkhuus is an associate professor in user experience at the IT University of Copenhagen.

→ [barkhuus@itu.dk](mailto:barkhuus@itu.dk)