# Designing Innovative Future XR Meeting Spaces

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Katherine Isbister 6 March 2024



SAN FRANCISCO State University





ALFRED P. SLOAN FOUNDATION

### Katherine's research

20 years of work at the intersection of HCI and games/play Over 100 peer-reviewed conference and journal articles Professor at NYU, ITU Copenhagen, and RPI before UCSC



### Social Emotional Technology Lab

Research through Design approach (prototypes of possible futures) Exploring design spaces that may not be well covered by industry practice.

Developing extensible design knowledge and methods as well as artifacts.



## A vision: XR Stella



### Key themes from this envisionment

Agile **interweaving** of XR and everyday life/work practices.

Ability for **end users** to **shape** appropriate environments for complex and nuanced social interactions. **Taking advantage** of the **unique** qualities that XR may offer to **enhance** human experience. **A sense of playfulness**, even in productivity contexts.

Joshua McVeigh-Schultz and Katherine Isbister, **The Case for "Weird Social" in** VR/XR: A Vision of Social Superpowers beyond Meatspace. Alt-CHI 2021. doi: 10.1145/3411763.3450377

### Three research phases in our journey toward this vision

Mozilla funded research on **Designing for VR Publics** NSF funded research on **Innovation in Social VR Meeting Spaces** Alfred P. Sloan Foundation funded research on **Supporting Scientific Sensemaking in Social VR** 

### Phase one: Interviews with designers and developers of Social VR Publics

### Phase one team:

### UC SANTA CRUZ Computational Media





Katherine Isbister

Joshua McVeigh-Schultz

Anya Osborne

## Social VR Designer/Developer Interviews











### "The more things change, the more they stay the same"

### **Collaborative Virtual Environments (CVEs)**



### Virtual World Ethnography



## Familiar themes:

Place and space shape expectations of behavior.

Social interaction can be shaped by catalysts, ice breakers, familiar activities to focus shared attention.

Proactive approaches to community engagement are often more powerful than reactive techniques like moderation.

## Familiar themes:

### Place and space shape the social frame

Harrison & Dourish (1996) "Re-Place-Ing Space: The Roles of Place and Space in Collaborative Systems" CSCW



"Rooms *are* behavior" — Corey Nolan, developer for Rec Room

# Architecture of Space





### But some things *are* really different

New aspects of egocentric (immersive) embodiment in VR New design opportunities for augmenting social interaction in VR New opportunities for user creativity

# **Embodied Signalling**



Image: Rec Room

Image: AltspaceVR

# **Embodied Signalling**



Image: Rec Room arm bands and emotive signals

### **Phase One Publications**

- McVeigh-Schultz, J., Márquez Segura, E., Merrill, N., and Isbister, K. 2018.
  What's It Mean to "Be Social" in VR?: Mapping the Social VR Design Ecology. Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems.
- McVeigh-Schultz, J., Kolesnichenko, A., & Isbister, K. 2019. Shaping Pro-Social Interaction in VR: An Emerging Design Framework. CHI '19: Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, paper no. 564, pp. 1-12, doi: 10.1145/3290605.3300794
- Kolesnichenko, A., McVeigh-Schultz, J. & Isbister, K. 2019. Understanding Emerging Design Practices for Avatar Systems in the Commercial Social VR Ecology. DIS '19: Proceedings of the 2019 Designing Interactive Systems Conference, pp. 241-252, doi: 10.1145/3322276.3322352

## Phase two: Research through Design approach to innovating VR meeting spaces

### Phase two team:

### UC SANTA CRUZ Computational Media



Katherine Isbister





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**Cognitive Psychology** 

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Hisel Esquivel

Phil Farillas





John Majoubi Diana Baldovinos

## Step one: Self study in VR meeting spaces

### **Examined Social VR Applications**



VRChat

AltspaceVR

Rec Room

### **Study Procedure**



Takes Place in Social VR Meeting Environment

### Analysis Approach

VR Meeting Sites, Total Number (N) of Participants' Responses



### Results

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### Avatars Systems Strategy

Avatar styles, range of choices, non-verbal expressivity.

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### **Invitation Model and In-world Cues**

Onboarding, UI navigation, manipulation of objects.

# **VR** Environments

Aesthetics and design of meeting environments.

### **24** Asymmetric Participation

Presence disparity due to the use of different devices.

### **Avatar Styles**





**Business-focused** 

Both

Leisure-focused

### **Avatar Expressivity**





### **Meeting Environments**

"Skeuomorphic"

"Prefabs-based"



"Experimental"



### Reflections

- Repeating design patterns
- Business-leaning platforms tended to delimit avatar choices, replicate familiar productivity spaces, and provide productivity-focused tools.
- Leisure apps provided latitude and attention towards self-expression, avatars and identity play
- Why not to break away from white boards and screens to more flexible support for social sense making?



- Group Meeting in a Custom VRChat Environment created by 'chuigame'

### Phase two, step one publications

 Osborne, A., Fielder, S., McVeigh-Schultz, J., Lang, T., Kreminski, M., Butler, G., Li, J.V., Sanchez, D.R., & Isbister, K. (2023). Being Social in VR Meetings: A Landscape Analysis of Current Tools. In 'DIS 23: Proceedings of the 2023 ACM Designing Interactive Systems Conference. doi: 10.1145/3563657.3595959

Embracing and Creating a 'Weird Future' for Social VR Meeting Spaces

## Step two: Conceptualizing a novel design space

# VR offers richer embodiment and spatialization Vr Recording I Di Staly's Westen

### https://spatial.io/

### Orienting to people and environment...



### **Chasing Realism: facial expressions in VR**



Image: Facebook Avatar Codec via Techcrunch https://techcrunch.com/2018/05/02/facebook-photo-realistic-avatars/

### Chasing Realism: screens, whiteboards, stickies



## **Beyond "merely" recreating face-to-face**

### **INSTEAD:**

*New* kinds of communicative affordances rather than "imitation of the mechanisms of face-to-face [interaction]."

Hollan and Stornetta. "Beyond Being There." 1992.

## **Beyond** "merely" recreating face-to-face



'Social Superpowers'

### 'Suprahuman Technologies'



- McVeigh-Schultz, J. & Isbister, K. 2021. A "Beyond Being There" for VR Meetings: Envisioning the Future of Remote Work. Human Computer Interaction. doi: 10.1080/07370024.2021.1994860
- Isbister, K. 2019. Toward 'Suprahuman' Technology. In *HTTF 2019: Proceedings of the Halfway to the Future Symposium 2019.* doi: 10.1145/3363384.3363468

Step three: Research-through-Design to create a toolkit of VR meeting augmentations

### An example: Conversation balance

What if we had playful support in VR meeting spaces for balancing our conversations?

How might we visualize talking turns?

What 'beyond being there' support could we provide to help participants gauge their contributions and adjust?



#### Prototype by Max Kreminski under guidance of Joshua McVeigh-Schultz & Scott Fisher in USC's Mobile & Environmental Media Lab.

Joshua McVeigh-Schultz et al. 2018. "Immersive Design Fiction: Using VR to Prototype Speculative Interfaces and Interaction Rituals within a Virtual Storyworld." Proceedings of the 2018 on Designing Interactive Systems Conference 2018 - DIS '18.

### Supporting Collaboration in Social VR



## **Conversation Balance**



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Embracing and Creating a 'Weird Future' for Social R Mae



Spaces

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### Phase two publications

 Li, J.V., Kreminski, M., Fernandes, S.M., Osborne, A., McVeigh-Schultz, J., & Isbister, K. Conversation Balance: A Shared VR Visualization to Support Turn-taking in Meetings. In CHI EA '22: Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems. Doi: 10.1145/3491101.3519879

McVeigh-Schultz, J.R., Márquez Segura, E., & Isbister, K.
 Embodied Prototyping in VR: Ideation and bodystorming within a custom VR sandbox. To be presented at the 2024 Design Research Society International Conference.

### Phase two toolkit release

### http://info.socialsuperpowers.net/

Ph.D. student Anya Osborne has conducted workshops and field studies of these tools and is currently finalizing analysis of the results.

### **Conversation visualization tool**



### Emoji sending tool



### Avatar changing room



### Space making kit: A tool for environmental modulation



### Space making kit: A tool for environmental modulation



### Flying platform: A tool for time management



### Flying platform: A tool for time management



## Phase three: Creating tools for shared scientific sensemaking using spatial data in VR

### Phase three team:

### UC SANTA CRUZ Computational Media





Katherine Isbister



Samir Ghosh

### **Research focus**

A **beyond being there** approach to supporting scientists in sensemaking using shared **spatial data** .

Working closely with scientists in multiple domains to understand how they work with spatial data in 2d, and how social VR might support their practices and help them generate new knowledge.

Goal: creating an open toolkit that can be used across scientific domains.

### First steps

In-depth interviews with wildfire evacuation researchers from Civil Engineering at UC Berkeley about their sensemaking practices

### First steps

# Mockups using Shapes XR of potential interactions with data, and feedback from the scientists about those mockups in headset.



### First steps

Scientists try out the mockups, and give feedback before implementation of the features.

### Phase three publications

 Ghosh, S., Wang, Y., Zhou, W., Lin, K., McVeigh-Schultz, J. & Isbister, K. Designing Shared VR Tools for Spatial Scientific Sensemaking About Wildfire Evacuation. In CHI EA '24: Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems (forthcoming).



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### Key takeaways

Our vision based on **designer interviews** and **self study** is of Social VR tools that take us **beyond being there** and give us **social superpowers** that take advantage of the unique capabilities of VR/XR.

As prototyping tools get better, it's easier for us all to explore this design space and co-create a future that involves:

Agile **interweaving** of XR and everyday life/work practices.

Ability for **end users** to **shape** appropriate environments for complex and nuanced social interactions.

**Taking advantage** of the **unique** qualities that XR may offer to **enhance** human experience. **A sense of playfulness,** even in productivity contexts.

### Industry shifts since we began the research

Avatars and playful Snapchat filters in Microsoft teams video conferencing software





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