



# Enabling Spontaneous Remote Interactions Through Augmented Reality Hallways



## 1 ABSTRACT

- HallwAE (Hallway, an Augmented Environment) explores AR-facilitated spontaneous remote interactions.
- It leverages existing social norms of hallways and passing places.
- This contrasts with scheduled video conferencing by enabling unplanned encounters.
- The Quest 3 AR application creates virtual hallway spaces for casual, natural interactions, bridging the gap between physical and digital social environments.

## 2 PROBLEM STATEMENT

- Video conferencing eliminates spontaneous interactions
  - All remote meetings must be intentionally scheduled [1]
  - No opportunity for serendipitous encounters
  - Leads to "meeting fatigue" and formalized interactions
- Existing solutions fail to gain traction
  - Require establishing entirely new social norms (colored flags, status indicators)
  - Don't integrate with established

## 3 METHODOLOGY

- **Conceptual Framework Development**
  - The team analyzed architectural theory from Alexander's "A Pattern Language"
  - Our team mapped hallway interaction patterns to virtual environment requirements
  - The research identified key social cues that trigger spontaneous interactions
- **Technical Implementation**
  - The HallwAE prototype is being developed for Quest 3 using Unity
  - We are exploring spatial mapping [3] to align virtual elements with physical surroundings
  - An adaptive rendering system that responds to different physical environments will be created
- **Interaction Mechanics**
  - A user matching algorithm is being designed
  - Gestures and movements are being developed to make conversations more intuitive
  - Ambient awareness indicators that signal availability will be implemented
- **Experimental Validation**

## 4 CHALLENGES

- **Environmental Integration**
  - Synchronizing different physical locations within a unified virtual space [2]
  - Creating meaningful overlays for diverse physical spaces
- **Technology Acceptance**
  - Comfort with wearing Quest 3 during regular activities
  - Balancing AR presence with physical world awareness
- **Social Presence Design**
  - Developing avatars that feel appropriately present
  - Creating natural interaction cues
- **Cross-Environment Compatibility**
  - Creating consistent experiences across different settings
  - Maintaining core interaction model despite physical differences

## 5 CONCLUSION

- User feedback suggests that AR-enabled spontaneous interactions in virtual hallway spaces are feasible, leveraging familiar social cues without requiring new social norms.
- Early testing shows that AR virtual hallways enhance social presence compared to traditional video conferencing, fostering more dynamic remote interactions.

## 6 ACKNOWLEDGMENT

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## 7 REFERENCES

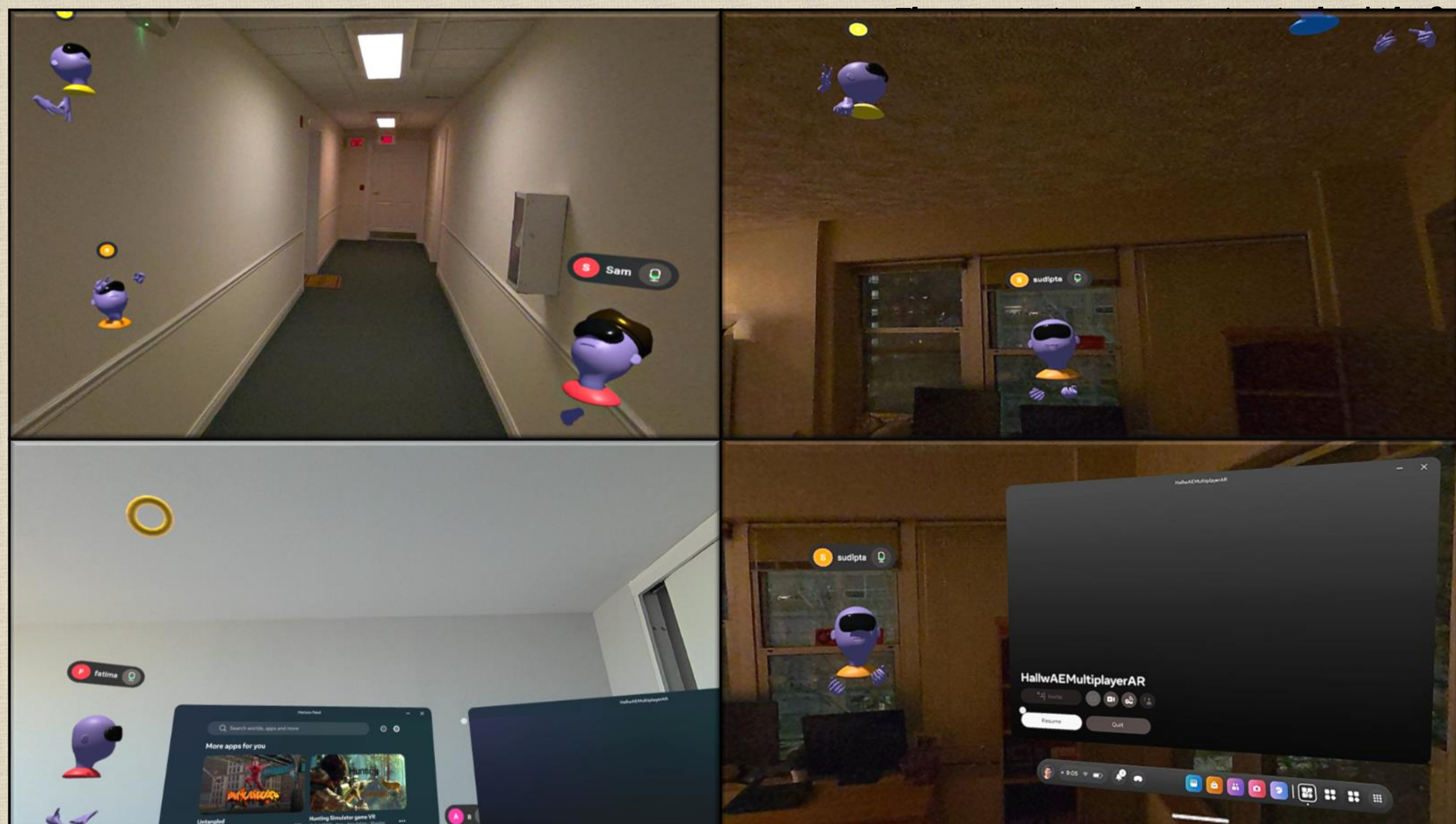
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2. Alexander, Christopher. *A pattern language: towns, buildings, construction*. Oxford university press, 1977.
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**Figure 2:** Users interacting remotely from different physical locations using Meta Quest headset, demonstrating HallwAE's capability for real-time spatial mapping and collaborative AR experiences.

## 8 TEAM MEMBERS

- Yuefei Zhang
- Satyam Rajput
- Sudipta Banerjee
- Fatima Mariyam
- Arina Ovcharenko
- Yerlen (Len) Bukeshev
- Sifang (Sven) Feng
- Hetanshi Darbar
- Mark Roman Miller (PROFESSOR AND MENTOR)



**Figure 1:** Working Demonstration of HallwAE Application  
Real-time screenshots showcasing interactive avatars representing users from diverse remote locations. The application seamlessly integrates AR pass-through and spatial mapping to enable spontaneous, natural interactions in virtualized hallway environments.