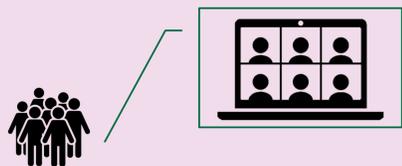


Inclusive Social Virtual Environments: Exploring the Acceptability of Different Navigation and Awareness Techniques

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Motivation



Social Virtual Environments are becoming ubiquitous in modern society.



But they are not designed to welcome everyone, with many currently disregarding accessibility.



However, these environments have potential to surpass the accessibility of the physical world, as elements and their locations are known at all times.

- How are different navigation methods in social spaces perceived by people navigating and in conversations?
- Which information should be conveyed in groups and outside?

Our Social Virtual Environment

We developed a Social Virtual Environment composed of 6 scenarios to explore 4 navigation techniques and 2 awareness of group dynamics:

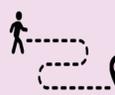
Navigation-Based Scenarios



Free Exploration: Freely move the avatar around the environment, by pressing the arrow keys.



Teleport: Navigate a menu of options to go through the different groups and select the desired group to teleport instantly.



Auto-Walk: Very similar to Teleport, but instead of reaching the desired group instantly, the avatar moves autonomously through the environment.



Co-Pilot: Join in with a second person (i.e. co-pilot represented by an autonomous avatar) who guides the user through the environment.

Group Awareness-Based Scenarios



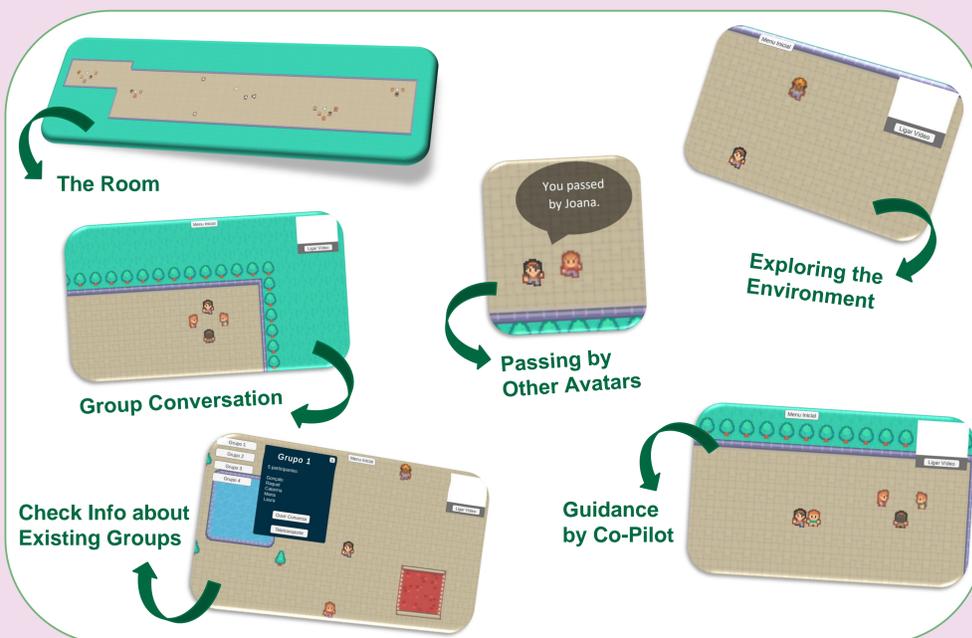
In-Group Footsteps: Perceive other avatars who join the group through the sound of footsteps.



In-Group Teleport: Earcons indicate that someone is teleporting to the group.

It is possible to experience 8 auditory awareness cues that are typically conveyed only visually:

- **Movement:** Footsteps Sounds
- **Collision:** Bumping Sounds
- **Information:** Passer by
- **Notification:** Corresponding keys
- **Environment:** Crowd Noise
- **Distance:** Conversation Previews
- **Presence:** Group Conversations
- **Action:** Joining Group Sounds



User Study

Participants

16 Participants (8 Blind + 8 Sighted): aged 19-63 (M=37.25, SD=13.75), with varied levels of experience with computers and virtual environments.

Procedure

Complete tasks:

Part One: experience different navigation techniques and auditory cues to find a specific group.

Part Two: while in a group, experience a sequence of events to illustrate different navigation and awareness techniques, executed by others.

Findings

- Privilege autonomy over efficiency
- Trade-offs between difficulty, efficiency, and room awareness
- Flexible navigation, no clear preferred method
- Audio feedback is essential for blind, but redundant for sighted people
- Important to access information, even from afar

