Enhancing Proxy Localization in World in Miniatures Focusing on Virtual Agents

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Introduction

Background

- **Virtual agents (VAs)** are increasingly utilized in large-scale architectural immersive virtual environments (LAIVEs) to enhance user engagement and presence
- Due to the expansive virtual space and visual clutter, **challenges persist in efficiently locating and interacting with them** in large complex settings
- Additionally, the challenge of locating these VAs **is further increased by their dynamic nature**, as they can freely traverse the LAIVEs without predictable patterns
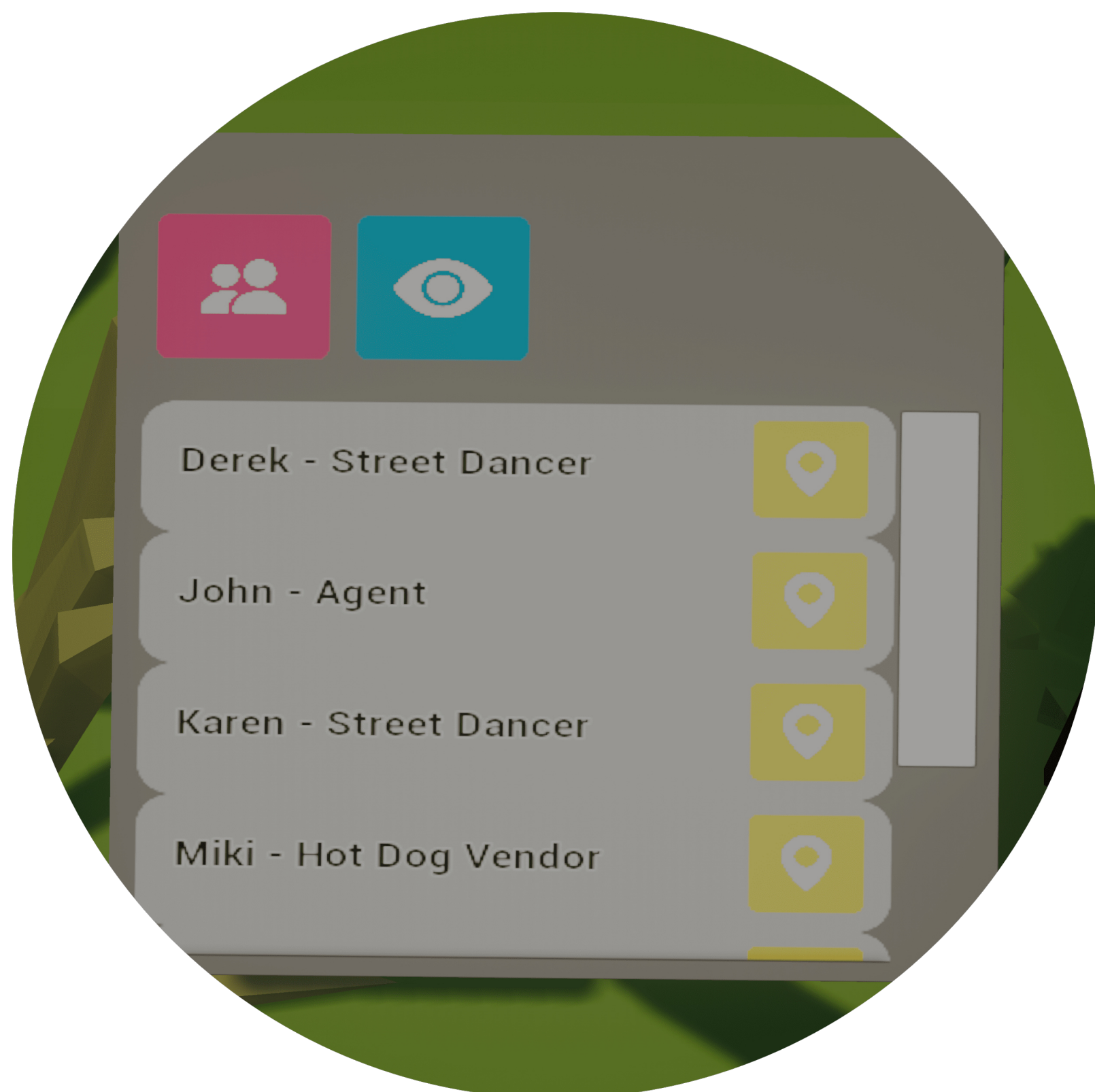
Research Objective

- Our work-in-progress focuses on developing a proxy localization system, tailored to the use-case of VAs

Figure 1: Our WiM setup with four interface elements located on the WiM's exterior: a WiM options panel (1) for general control, an overview panel (2) offering a list of all VAs and an individual localization option, and a temporary storage box (3) and an agent panel (4) for VA orchestration.
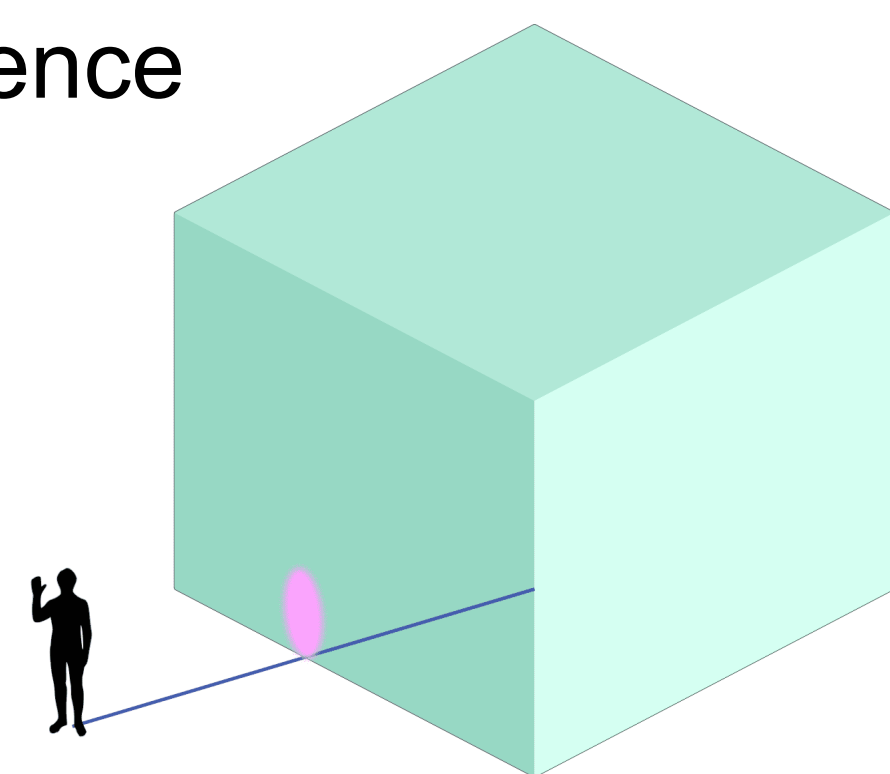
Proxy Localization in World in Miniatures

Find in World

- The **overview list** lists all agents, while presenting essential, predefined, information such as their names and role
- The yellow button enables efficient localization of the respective proxy, allowing users to effortlessly center
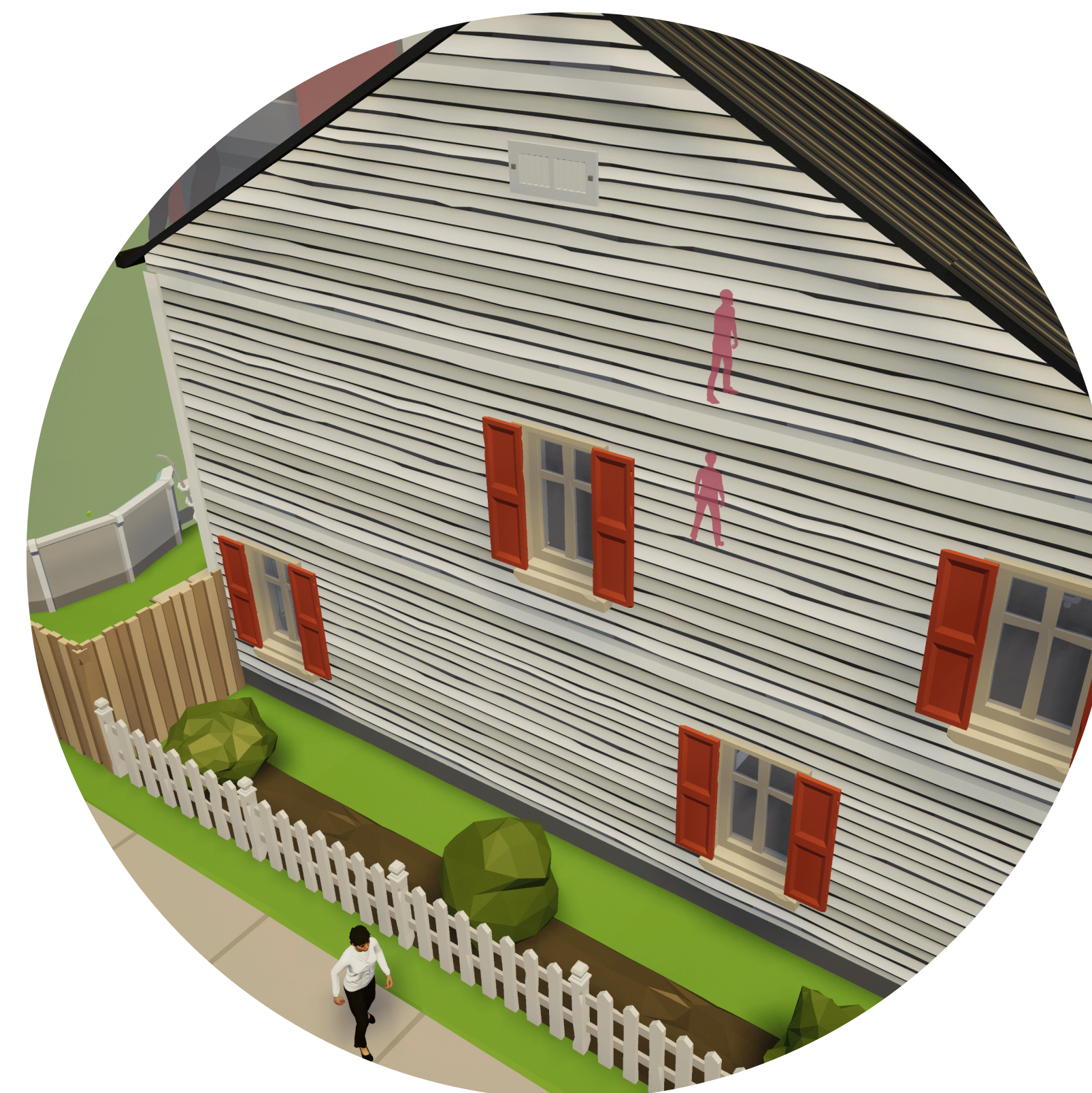
Close Proximity Localisation

- Users may require to quickly find nearby VAs avoiding unnecessary delays or distractions for a smoother experience
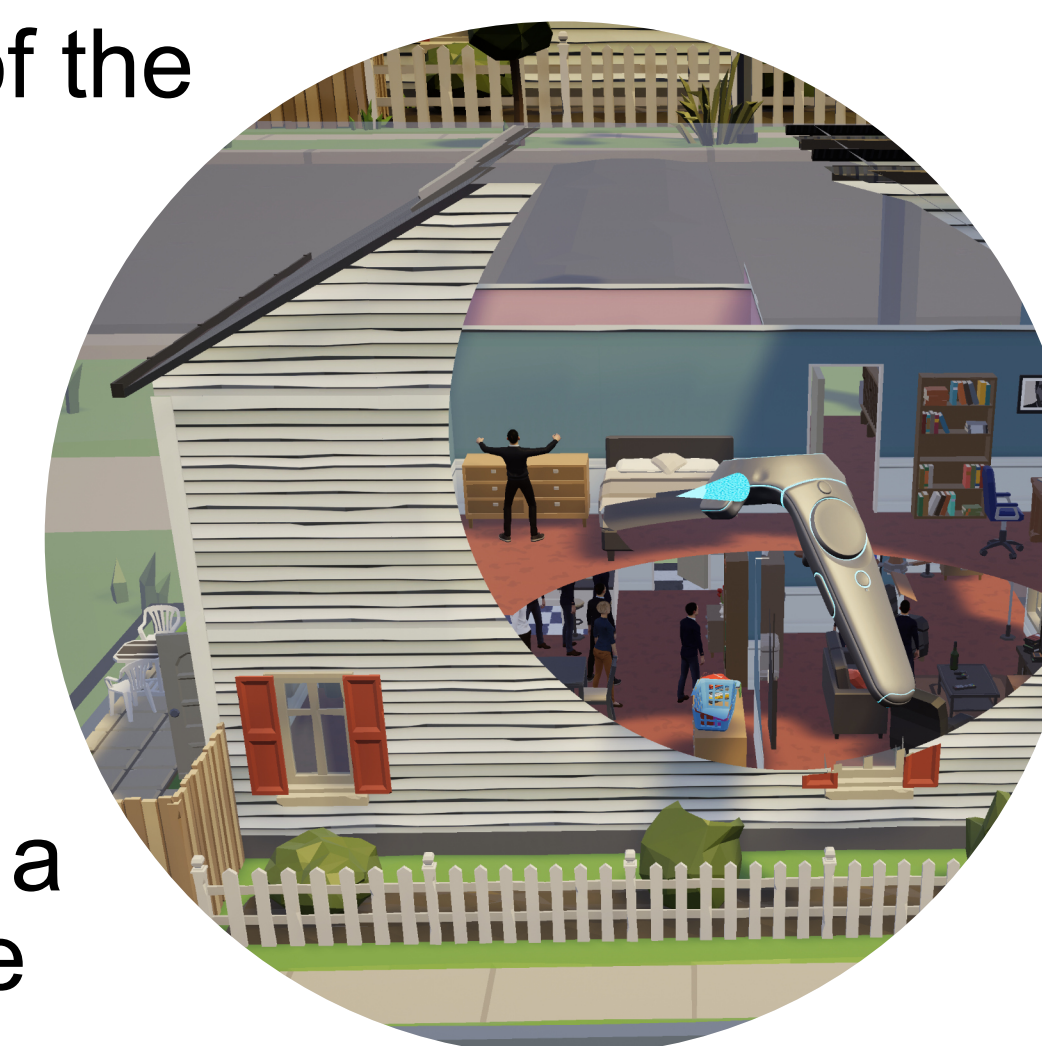
- Magenta indicators placed at the base of the view volume display the direction of the nearby proxies, effectively guiding users in the right direction.

Occlusion Management

- We highlight the silhouettes of the proxy VAs against static geometry, ensuring that users can clearly
- We selectively render overlapping parts of the miniature scene invisible while maintaining the visibility of the proxy VAs, enabling users to peek inside buildings providing a better view onto the proxies.

Scene Authoring

- Users can interact with VA by pointing to trigger a blue highlight, clicking to select it (turning the highlight green), and viewing VA
- Users can reposition it with a snapping feature for precise ground placement

Feasibility Study and Outlook

Study

- Six participants: 5 males, 1 female; M: 26.83, SD: 6.3
- Carefully chosen tasks were employed to gather insights on the WiM's usability as a virtual agent management tool
- Head-mounted display (HMD) used

Results

- Promising, with participants intuitively navigating the controls and executing the tasks
- Issues related to selecting and picking up virtual agents, especially when the scene was zoomed out

Next Steps

- Refine the current interaction patterns
- Deal with miniature interaction at reduced view scales
- Explore alternative WiM implementation methods to alleviate CPU strain and improve user experience, as duplicating scene assets currently causes lag

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