Where Do They Go?
Overhearing Conversing Groups during Scene Exploration

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Introduction

Background
- Scene exploration in large-scale immersive virtual environments (IVEs) is non-trivial and needs to be supported
- Wayfinding is a social activity [Dalton2019]
  - → Using virtual pedestrians as social cues and following them [Bönsch2021]
  - → Challenge: Navigation goal remains unknown

Research Objective
- Are conversing groups effective for indirectly guiding users to points of interest (POIs) as a social wayfinding technique and how do they impact gained scene knowledge?

Requirements
- Conversational groups distributed over entire IVE
- User-aware groups inferring user interest in their conversation

Indirect Guidance by Conversational Groups

Fig. 1: User (Unreal mannequin) following a mobile conversing group to find a POI, while passing various static conversing groups.

Locomotion-Related Behavior of Social Groups
- Intelligent distribution of static social groups in IVE
- Equally assign groups to top three unvisited POIs
- Users approaching group triggers start of conversation, allowing users to overhear it, sharing knowledge about POI as well as directional information
- Analyzing user's interest in conversation
- Inferred interest triggers group socially compliant walking towards goal while continuing conversation
- On user diversion, group pauses to regain attention before resuming navigation

VR-based User Study

Within-Subjects Design (→ randomized order)
- C0: Non-talkative social groups
- C1: Babbling social groups (POI unrelated)
- C2: Conversing social groups (POI related)

Participants
- 24 (20 males, 4 females; age: M = 24.4, SD = 1.5)

Study Task Per Condition
- Exploring unknown IVE for 7 min to find all POIs
- Social groups only differ in conversation behavior

Results
- One-way repeated-measures ANOVA on found POIs F(2,46) = 15.31 indicated
  - → C1 performed worse compared to C0/C2 (p < .001)
  - → No difference between C0 and C2 (p = 1)

- Gained spatial knowledge was highest in C0, followed by C2 and then C1
- Preference for C2 in free-text fields:
  - → Enhanced realism and perceived intelligence of pedestrians
  - → Conversations linked to behavior led to increased credibility and engagement
  - → Directional information allowed a sense of shared exploration, improving again credibility
- Some participants used conversational hints for independent exploration, rather than directly following groups

Lessons Learned
- User preference for goal-oriented conversations
- Babbling distracts from or masks the pedestrian's movement cues
- Spatial knowledge best when focusing solely on own route

Literature

Dalton et al., 2019
Wayfinding as a Social Activity. Frontiers in Psychology
https://doi.org/10.3389/fpsyg.2019.00142

Bönsch et al., 2021
Indirect User Guidance by Pedestrians in Virtual Environments.
ICAT-EGVE, https://doi.org/10.2312/egve.20211336

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