

Evaluating Presence Strategies of Temporarily Required Virtual Assistants

Andrea Bönsch, Tom Vierjahn and Torsten W. Kuhlen
 Visual Computing Institute, RWTH Aachen University
 JARA – High-Performance Computing

1 Introduction

Virtual Agents as assistants in immersive support systems

- Executors of scene commands given by user [1]
- Interlocutors answering questions

May I help?



Our goal:

- Design guidelines for temporarily required assistants
- Trade-off between two factors:
 - Presence time (PT): time the assistant is shown
 - Fallback time (FT): time until users get support

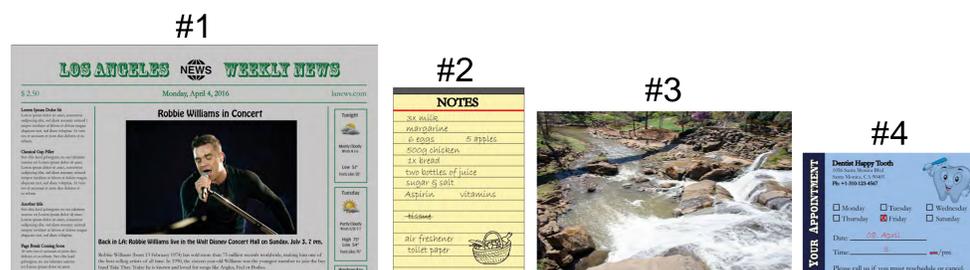
2 Experimental Variables

V1: Strategies representing assistant's behaviors

	low	high
high	Moving walking by & leaving	Busy self-reliantly working nearby & returning to work
low	Fading fading in & out	Omnipresent constantly following the user
	low	high

V2: User task

Pick up four items and talk to assistant about them



- *Go-to task*: goal-oriented navigation
 → Position of items known (#1 and #2)
- *Search task*: explorative navigation
 → Position of items unknown (#3 and #4)

3 Hypotheses

H1: Fading is not preferred.

- Optimal, i.e., low, values of both PT and FT
- Too unrealistic for human-like assistants

H2: Omnipresent is preferred for go-to task.

- Preference on low FT with acceptance for high PT
- Users know support is needed within the next moments

H3: Moving is preferred for search task.

- Preference on low PT with acceptance for high FT
- Users have to fulfill a certain task at first on their own

4 Planned Study Design

Display System [2]

- Five-sided CAVE, 360° horizontal field of regard
- w x d x h: 5.25m x 5.25m x 3.30m
- Equipped with loudspeaker and microphone array



Immersive, virtual scene

- Two-man apartment
- SmartBody character Rachel [3] embedded as assistant
- Text overlay illustrates the planned speech-based interaction



Procedure of our within-subject user study

- 1: Introduction and informed consent
- 2: Exploration without assistant
- 3 - 6: All strategies, random order
 Per Strategy:
 - Picking up all four items (both tasks)
 - Talking to assistant about items
 - Interim questionnaire
- 7: Final questionnaire, semi-structured interview

References

- [1] McGlashan, S.: Speech Interfaces to Virtual Reality. In: 2nd Intern. Workshop on Military Applications of Synthetic Environments and VR, 1995
- [2] Kuhlen, T.W., Hentschel, B.: Quo Vadis CAVE: Does Immersive Visualization Still Matter? In: IEEE Computer Graphics and Applications, vol. 34, no. 5, pp 14-21, 2014
- [3] Shapiro, A.: Building a Character Animation System. In: Intern. Conference on Motion in Games, pp. 98-109, 2011

