

Effect of Hand-movement on the Presence of another Person in a Virtual Environment

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Idea:

Meetings play a huge role in the business world. Currently, for many of them, people have to travel a lot, to talk to other businesses in person. As this is not only time consuming but also has a huge effect on climate, some meetings are already held via Skype or phone. For meetings with more than two people, this can be really challenging, as it is hard to detect who is talking to whom, and also facial expressions and gesture is lost, which can be very helpful to express oneself. With hand movement we emphasize viewpoints and we can direct our attention to another person by pointing in their direction, which is lost when talking to other people via phone.

VR technologies are getting more and more ubiquitous and advanced. In a virtual environment, a person can take the role of an avatar, which can represent their real-life appearance.

Also currently input modalities like hand tracking or even full body tracking are emerging.

To feel immersed in a virtual space, presence and embodiment are mandatory. Having a body, or hands in VR, which mimic the hand movement in the real world highly increases self-location and thereby embodiment.

To be able to replace real-life meeting through VR meetings, the presence of other avatars should be as similar as possible to real-life presence. We know that hand movement plays a huge role in real-world conversations and we know, that hand movement highly increases the presence felt of an avatar one represents. But what about feeling the presence of other people in a virtual space. Can this be enhanced by seeing their hand movement?

For this, we want to conduct a study with two persons being in the same virtual space and each being represented by an avatar. We want to study, how hand movement of one person enhances the presence of this person felt by the other person.

We propose the independent variable *hand movement* (No movement, fake movement, real movement).

We want to create a virtual space representing a conference room, placing two avatars, controlled by two people in this space, letting them have a conversation, with a within-subject design, having qualitative surveys after each condition in VR, how present the other person felt in the conversation and one large survey (Nasa-TLX or similar) at the end of the study.