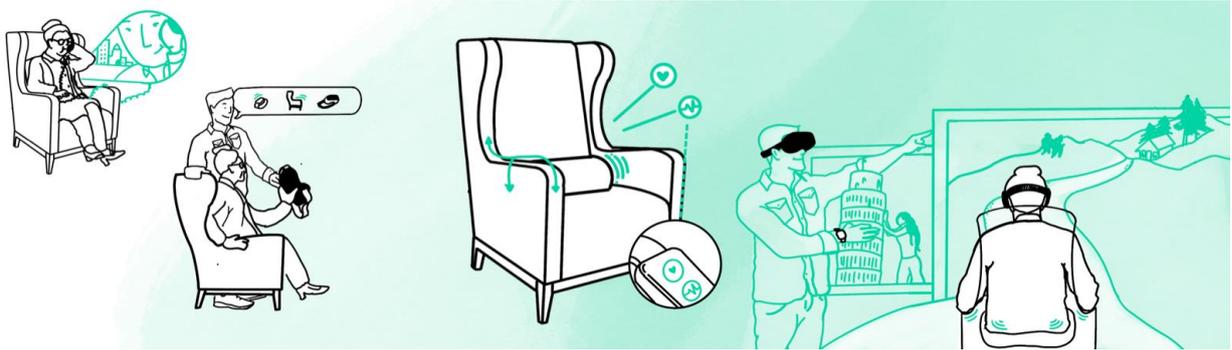


<b>Project Title:</b>	ZEIT – Shared experience and immersive participation through tactile enhancement of virtual reality in multi-user scenarios	<b>Univ.-Prof.</b> <b>Prof. h.c. (Moscow State Univ.)</b> <b>Dr.-Ing. Dipl.-Wirt. Ing.</b> <b>Thomas Gries</b> Director
<b>Partner:</b>	OFFIS e.V. VISSEIRO GmbH Bergische Universität Wuppertal AWO Wohnen und Pflegen gGmbH	<b>Felix Krooß, M.Sc.</b> <b>Hannah Kelbel, M.Sc.</b> Research Associates
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## Mission Statement

Social connectedness is a key factor for well-being in our lives. "Few things are more beneficial to health than being joyfully with other people." (Schnabel, 2015). Loneliness, on the other hand, makes us sick. In times of the pandemic, it became clear once again how important social connections are for us. Being separated from loved ones and not in social communication is painful for us. The risk for the occurrence of clinically relevant depressive symptoms in the aftermath of quarantine is about one third (Röhr et al., 2020). Especially with increasing age, social networks and social participation have been shown to decrease. According to the Federal Statistical Office, 16.9 million people live alone in their homes, with 5.8 million being 65 years old or older (Destatis, 2020). By 2040, one in four people in Germany is expected to live alone.

Current communication technologies, such as tablets, are often not very well accepted by older people. The obstacle here is not so much the ease of use, but rather the fact that they are not addressed in a way that is appropriate for the target group. Older people are not used to communicating via a small screen, as young people are, for example, and reject this. In addition, it is often difficult to read due to visual impairments. Promoting social participation thus also means strengthening the connection of older people in their social networks of families and friends. AR/VR technologies can already augment social interactions beyond what is possible in reality (Roth et al., 2019). However, numerous challenges remain in shared immersion (Brown et al., 2017) and incorporating additional modalities beyond video and audio (Wang et al., 2020).



## Objective and Approach

In this project, social connections across separated or at a distance living people are to be strengthened through Mixed Reality and social signals. The focus is on the emotional aspects of interpersonal communication, such as the transmission of joy and happiness, contentment, discomfort, stress and worry, but also on the typical physical interactions that are otherwise missing in video and audio communication, such as touch, hugs, handshakes in greeting or pats on the back for praise and confirmation.

The aim of the joint project is to research and develop a multimodal, target group-centered immersion technology as a system solution for building bridges between older people living alone and their relatives to answer the following question: How can immersive tactile stimuli in a VR environment be used to communicate interpersonal emotions over a distance? For this purpose, the experience that can be conveyed visually in a VR application is supported by tactile stimuli over a large area of the body. Programmable active textile actuators are used that do not require complex mechanical actuators, which can be adjusted to achieve the desired effect, that can be integrated into digital systems and can be seamlessly embedded into textile household objects. Textiles lie close to the body and thus enable very good transmission of tactile stimuli. To fulfil a needs for the target group, the textiles can be integrated into the arm and backrest of a chair and do not have to be worn. The processing of reactions to the immersive stimulation by means of affective computing also enables the creation of a feedback system to other participants in multi-user scenarios. The integration into a familiar household object, the chair, makes the use of the overall system thus suitable for the target group.

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