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IoT and Older Adults: Towards Multimodal EMG and AI-Based Interaction with Smart Home

Abstract

We report preliminary insights from an exploratory study on non-standard non-invasive interfaces for Smart Home Technologies (SHT). This study is a part of a broader research project on effective Smart Home ecosystem Sagacity that will target older adults, impaired persons and other groups disadvantaged in the main technology discourse. Therefore, this research is in line with a long-term research framework of HASE research group (Human Aspects in Science and Engineering) by the Living Lab Kobo. In our study, based on the prototype of the comprehensive SHT management system Sagacity, we investigated the potential of bioelectric signals, in particular EMG and EOG as a complementary interface for SHT. Based on our previous participatory research and studies on multimodal interfaces, including VUI and BCI, we prepared an in-depth interactive hands-on experience workshops with direct involvement of various groups of potential end users, including older adults and impaired persons (total 18 subjects) to explore and investigate the potential of solutions based on this type of non-standard interfaces. The preliminary insights from the study unveils the potential of EMG/EOG interfaces in multimodal SHT management, alongside limitations and challenges stemming from the current state of technology and recommendations for designing multimodal interaction paradigms pinpointing areas of interest to pursue in further studies.