Acoustic user interfaces for ambient-assisted living technologies

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This contribution discusses technologies for acoustic user interaction in ambient-assisted living (AAL) scenarios. Acoustic user interfaces allow for a natural and convenient way to interact with technical systems e.g. via sound or speech presentation or via speech input by means of automatic speech recognition (ASR) as well as by detection and classification of acoustic events. Older persons targeted by AAL technologies especially need more easy-to-use methods to interact with inherently complex supporting technology. As an example we designed and evaluated an application for acoustic user interaction with a multi-media reminder and calendar system. For this purpose, mainly older participants were involved in user studies to continuously evaluate and support the development strictly following a user-centred design process. The results suggest a wide acceptance of acoustic user interfaces by older users either for controlling inherently complex AAL systems by using robust ASR technologies or as a natural and ambient way of presenting information to the user. However, further research is needed to increase the robustness of ASR systems when using hands-free equipment, i.e. to provide a real ambient way of interaction, and to introduce personalised speech and sound presentation schemes accounting for the individual hearing capabilities and sound preferences.

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