Gesture controlled user interface for elderly people

Abstract
Global population aging has become a serious issue, which gains increasing attentions all over the world. More and more researches about elderly people were conducted, especially about senior’s interaction with computer. Hence, the goal of this research is to identify usability and accessibility issues faced by elderly people and provide a usable and accessible gesture controlled user interface (GCUI) for them. Moreover, this thesis provided some suggestion of accessibility guidelines for GCUI. Meanwhile, the problem of aging is particularly significant in China, which is one of the world’s most populous countries. Considering this problem, this study was performed over Chinese elderly participants. Due to the wide gap between younger designe’s experience and experiences of the older users, it is important for designers and developers to increase the awareness of the characteristics of elderly people. Hence, the user-center design approach was used in the process of design and development. User testing, interview and accessibility testing were used to identify the usability and accessibility of prototype of GCUI in different stages. The result of usability testing confirmed that the prototype of GCUI is easy for elderly people to learn and understand. Furthermore, the result of accessibility testing indicated that this prototype of GCUI partially meet the accessible requirement. However, there are some limitations in this thesis. For instance, user experience is dependent on the accuracy of hand gesture detection and recognition. The program lacks audio feedback and does not support assistive technology. All in all, GCUI can provide a new opportunity for elderly people to interact with computer.

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As people age, they may also have difficulty paying attention to multiple tasks. Brain computer interface technology could be one potential tool for restoring learning and improving memory, attention, and consciousness for cognitively impaired elderly patients (Buch et al., 2018). For instance, non-invasive BCIs have been used for restoring memory and planning using electromagnetic stimulation and biofeedback that modulate activity in a patient’s brain as part of a rehabilitation program. Finally, an intelligent wheelchair such as RoboChair, with a head gesture-based interface, can be used for mobility with little effort (Gray et al., 2007). Controlled by health professionals via tablet, Zora can lead a physical therapy class, read TV shows, weather forecasts, or local news. Assisted living facilities in adopting Zora to keep their residents entertained and active with dance and exercise. Over 1,000 robots were sold to hospitals and care facilities so far. Face cameras allow it to adjust its behavior based on gesture and user interface recognition. A Care-O-Bot can speak through LEDs, sounds, speech-to-speech, laser, and body gestures. It is built on an open-source operating system that can be continuously changed and improved. Currently, Care-O-Bots have been successfully used in German, providing health care, companionship, and cognitive stimulation. If your making a separate GUI for elderly people it's probably best you make it yourself from whatever existing code/libraries you have. Like increasing the element and text sizes, and increasing the contrast. But not too much that you make the majority feel patronised. Most GUI libs support some kind of widgets that can be used for people that have some problem with their eyes or such. However, I don’t think that there is a library that is particularly targeted to that. Hence, I would use GTK or Qt.