iKnowU - Smart Glasses for Visual Impairment

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Master thesis in Computer Science

There is a type of syndrome called unilateral spatial neglect. People with this syndrome neglect, in most cases, one part of their visual field of view. There are a lot of researchers which present assessment and rehabilitation tests and tools for people with unilateral spatial neglect. Researchers have transformed the traditional paper-pen solutions into virtual reality. In recent years, the technology has advanced and augmented reality is becoming more and more popular. Despite the rise in popularity and accessibility of such technology, their use in rehabilitation has not yet been researched extensively. This thesis describes the research of creating a possible augmented reality rehabilitation tool for people with unilateral spatial neglect.

In the first phase of this thesis, a literature review of existing rehabilitation tools for unilateral spatial neglect patients has been done. It determined that there is a lack of augmented reality rehabilitation tools for unilateral spatial neglect patients. Further, possible hardware and software technologies suitable for the realization of this rehabilitation tool were investigated and selected. A first user interface was developed and tested with a participant that showed symptoms of unilateral spatial neglect. The second user study, evaluated the application with 27 healthy participants. The participants had to identify a target face among 12 other faces, with and without the application.

The results show that the application has potential to be a rehabilitation tool, since it changed the natural reading behavior of healthy participants, changes on participants with USN must be further investigated. Additionally, the participants stated, that the tool could be helpful, and reduced their cognitive load while using the application.

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