

USER INTERFACE FILTERS FOR TACTILE BRAILLE DISPLAYS

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ABSTRACT

Visually impaired people use assistive technologies to access computers and mobile technologies. But the common text- and line-based information retrieval is opposed by increasingly graphical and dynamic content. We describe and compare three research projects with different approaches for improving the accessibility of applications for visually impaired by filtering user interfaces on two-dimensional tactile Braille displays. Based on earlier conducted research and the comparison of our projects we show that such filters improve the accessibility of applications and allows users without software development skills to adapt applications for visually impaired. Furthermore, we propose that re-thinking the process of designing inclusive systems in general would help to raise the full potential for wide-spread use and interoperability of assistive technologies.

Keywords: assistive technologies, accessibility, visually impaired, user interface filters, tactile user interfaces, framework

1. Introduction

Various information and communication technology, such as computers, tablets, smartphones and smartwatches, are omnipresent in our everyday lives. People with disabilities are often excluded from the use of software applications on these devices, though legal regulations like the UN Convention on the rights of persons with disabilities [58] claims the opposite. Considering graphical user interfaces (GUIs) and the user group of visually impaired people, in particular, this is due to raising the degree of information density, resolution and multimedia-based content. But mobile technologies and the Internet also facilitate orientation using navigation apps, communication via instant messaging and information retrieval at all times and can thus be of great support for people with different kinds of disabilities. Assistive technologies help to overcome perceptual restraints of graphical user interfaces by transforming the content according to the user's needs and thus allowing people with disabilities to benefit