

EVALUATION OF SOUND EFFECTS AND PRESENTATION POSITION FOR UNIVERSAL DESIGNED INTERACTIVE MAP WITH DUE CONSIDERATION FOR VISUALLY IMPAIRED PEOPLE

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Received January 2010; revised July 2010

ABSTRACT. *Protecting the lives and the rights of the impaired people and promoting their social participation is a paramount principle today. Especially for visually impaired people, map usage and route recognition is an important function for promoting social participation. So we have been developing a new assistive interface which they can intuitively recognize the map using audio and touch panels. The assistive interface is universal designed to enable not only the visually impaired people but also the non-impaired people to enjoy using interactive digital map contents together. This paper introduces our recent progress about the assistive interface called the One Octave Scale Interface. The effectiveness of the interface was confirmed by doing experiments of graph and map recognition and a walking experiment after presenting route guide map.*

Keywords: Visually impaired people, Assistive technology, Interactive map, Spatial recognition, Touch panel

1. **Introduction.** A map and its spatial expression offers people a very important support for human mobility. But for the visually impaired people, they have many difficulties in reading maps and using spatial information in the field. To make these impaired people read maps, there are a few maps and tools made for them such as metallic guide plate which floor plan of buildings and braille are carved [1], paper maps which use only braille as spatial expression [2], paper maps with the tags which are read by a tag reader to play voice guide[3,4], and a PC interface with voice and joystick feedback to operate digital maps [5]. The problem with these previously developed maps and tools is that it requires special ability to read braille, or special PC tools to use normal paper and digital maps. These special PC tools are very expensive and it is not easy to update frequently, which made it very hard to diffuse widely. Thus, we focused on the touch panel. In these days, the touch panels are embedded to PC and cell-phone which makes it cheap. If we can download and use the application of the map like plug-in of browsers, we could update it frequently. Like the system of education support for acquired visual impaired people, it is targeted to the people of middle age [6]. Also there are only few researchers or even none who have a goal to develop the universal designed map contents expression today, a map that both visually impaired people and non-impaired people can use at the same time. We therefore research and develop the universal designed map which provides spatial information interactively for all people including visually impaired people with no vision by using contents expression which unites sense of sight, hearing and touching.