Chapter 14
Production Method of Readable Tactile Map With Vocal Guidance Function for the Visually Impaired

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ABSTRACT

Braille/tactile maps are one of the most traditional tools that guarantee information accessibility for children and people with visual impairment. Silk screen printing method, which is employed as one of the traditional production methods of producing Braille/tactile maps, are becoming more and more popular. However, the printing quality requires further improvements. On the other hand, when using a tactile map, it is not easy for visually impaired persons to acquire spatial information based on only tactile sense. Therefore, a convenient technology that allows the acquisition of tactile map information with voice in addition to tactile sense is desired. Thus, in this chapter, an original production method of tactile maps for public facilities that has high readability and voice technology to guarantee information accessibility is introduced. And a production method for tactile maps of public facilities with vocal guidance function to improve the readability of Braille/tactile map is mentioned based on a trial example.

INTRODUCTION

With revisions to disability acts, such as the act on the elimination of discrimination against persons with disabilities implemented in April 2016 in Japan, further development of assistive technologies for people with disabilities is expected. One of the needs under such circumstances is development of assistive technologies for children and people with visual impairment. Especially, it is said that people obtain a majority of external information visually in their daily life. Therefore, guaranteeing information

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accessibility for children and people with visual impairment is an extremely important research topic. And the social responsibility of the contribution of studies to enhance assistive technologies and tools to guarantee accessibility to information is notable. Among the tools to guarantee information accessibility utilized by children and people with visual impairment, Braille and tactile maps are popular as traditional tools. Braille consists of letters that combine six dots (three rows by two columns) and is an information transmission method for children and persons with visual impairment to read and write at their own pace. Braille plays an important role in supporting children and people with visual impairment to be socially independent. Tactile maps are tools to guarantee information accessibility for children and people with visual impairment that provide spatial information by touch. And tactile maps are being used as guide maps for public facilities such as parks, subways, restrooms and so on. The silk screen printing method which allows the sharing of printed products by children and people with visual impairment and sighted persons, is garnering attention in recent years among the production methods for Braille and tactile map. However, its poor printing quality is an issue. Many Braille learners find it uncomfortable to obtain the spatial information of tactile maps from only of tactile sense, and there is no suitable technology to add voice information that allows for the acquisition of tactile map information in addition to tactile sense.

In this chapter, an original production method of tactile maps for public facilities that has high readability and voice technology to guarantee information accessibility is introduced. Also, a production method for tactile maps of public facilities with vocal guidance function to improve the readability of tactile maps is mentioned based on a trial example. Through this research, we hope to improve the environment so that children and people with visual impairment can safely and voluntarily use public facilities, thus helping them to become independent.

BACKGROUND

In this section, how to develop a production method for tactile maps of public facilities with high readability and advanced technology to guarantee information accessibility is discussed.

People acquire the majority of information visually. Therefore, various attempts have been conducted to guarantee information accessibility for those with visual impairment (American Foundation for the Blind, 2018; Royal National Institute of Blind People, 2018). In the future, the provision of shared services in which the same printed products can be used regardless of visual impaired persons or sighted persons, is desired to move toward an inclusive society from the perspective of "improvement of information gap" and "universal information design". Under above mentioned circumstances, Braille and tactile maps produced by the silk screen printing method using colorless and transparent ultraviolet cured ink have been printed on picture books in recent years. Therefore, providing a shared service in which children and people with visual impairment and sighted persons can both use the same picture books (Universal Design Picture Book Center, 2018) is beneficial. The silk screen printing method is one printing method based on universal design that creates tactile maps by using Braille, raised dots, raised lines, and raised planar patterns. It can print on various materials such as papers, plastic, and metals and is much more durable compared with traditional other printing methods. Furthermore, it is able to print Braille and tactile maps on visual characters. This method may be applied to the tactile maps of various public facilities. However, the issues of the silk screen printing method make it difficult to express detailed