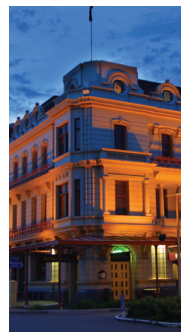




**IMC14**  
international mobility conference 2012  
mobility through the ages, up over & down under



**Conference Proceedings on CD**  
**13<sup>th</sup> – 16<sup>th</sup> February 2012**

**Sekita**

## **Flexibility of fundamental guiding method for a visually-impaired person**

I. Sekita<sup>1</sup>, Y. Kakiue<sup>2</sup>, H. Shishido<sup>3</sup>, M. Ishikawa<sup>4</sup>, T. Sakai<sup>4</sup>, R. Endo<sup>3</sup>, C. Mashiko<sup>5</sup>,  
Y. Chiba<sup>6</sup>, N. Yamaguchi<sup>7</sup>, M. Pauly<sup>1</sup>, H. Tatsumi<sup>1</sup>, T. Murakami<sup>3</sup>

<sup>1</sup>Tsukuba University of Technology (NTUT), <sup>2</sup> NTUT, <sup>3</sup>NPO Shirogame, <sup>4</sup>Tokyo Independent Living Support Center for the Visually Impaired, <sup>5</sup>Tokyo Metropolitan Rehabilitation Center for the Physically and Mentally Handicapped, <sup>6</sup>Miyagi Prefectural Blind School, <sup>7</sup>Kansai Home for the Blind Woman

Author(s) Email: [sekita@cs.k.tsukuba-tech.ac.jp](mailto:sekita@cs.k.tsukuba-tech.ac.jp)

The way to guide-help - to assist a visually-impaired traveler - should be flexible, according to the requirements from a visually-impaired person (VIP). The fundamental techniques of guide-helping were researched by NPO Shirogame and were published. A technique is useful, even though it is sometimes different from what is actually requested by a VIP, because the difference is expected to be noticed by us, i.e. where to pay safety-conscious attention. However, the difference is sometimes not sufficient to notice the attention points, especially for unskilled Guide-Helpers (GHs). The goal of this paper is to clarify the attention points in applying a fundamental technique to the requested one, in order to guide-help the VIP with safety and comfort, as much as possible.

---

To accomplish the goal, a questionnaire asked VIPs their preferred way of being guided.

As a result, most preferences can be indulged by the fundamental techniques safely and easily. However, the following preferences are different:

- \* There is no need to touch a door or a frame of a door in passing through the door. (In the fundamental way, the VIP prefers to touch a door or a frame of a door.)
- \* Touching the backrest of a chair by one hand is enough to know the chair. (In the fundamental way, the VIP prefers to touch the backrest and the seat surface using both hands sequentially.)
- \* There is no need to stop before stairs. (In the fundamental way, the VIP prefers to stop just before the stairs, and be informed of its shape e.g., "upper stairs" or "lower stairs".)
- \* There is no need to touch a door or a frame of an elevator on entering or exiting it. (In the fundamental way, the VIP prefers to touch a door or a frame of an elevator.)

In this paper, safe and comfortable guide-help techniques based on the above preferences are examined, and part of the techniques and their video images are shown. Conditions under maintaining safety in applying the technique are also shown.

## **Introduction**

This paper clarifies the attention points for a Guide-Helper (GH) --- assistant of a visually-impaired traveller --- when he applies a fundamental guide-help technique to a visually-impaired person's (VIP's) request. The way to guide-help should be flexible, according to the requirements from a VIP. The fundamental techniques of guide-helping were researched by NPO Shirogame and were published. A technique is useful, even though it is sometimes different from what is actually requested by a VIP, because the difference is expected to be noticed by us, i.e. where to pay safety-conscious attention. However, the difference is sometimes not sufficient to notice the attention points, especially for unskilled GHs. The goal of this paper is to clarify the attention points in applying a fundamental technique to the requested one, in order to guide-help the VIP with safety and comfort, as much as possible.

## **Preparation**

NPO Shirogame has researched the fundamental techniques of guide-helping and published a textbook. In order to describe the techniques clearly, they define "guide-side" and "free-side" for a hand, arm, leg, etc. The "guide-side" is the connection side between a GH and a VIP. The "free-side" is the other side. For example, when a VIP's left hand holds a GH's right elbow, the VIP's left side and GH's right side are called guide-side. And the VIP's right side and GH's left side are called free-side.

## **Requirements on Guiding Techniques from VIPs**

VIPs in their twenties are physically-active and they might request a different guide-help technique from the fundamental guide-help technique. We asked 14 VIPs their preferred way. We examined the preferences, and chose inapplicable techniques by the fundamental techniques which could increase the risk of an accident.

As a result, most preferences were indulged by the fundamental techniques safely and easily. However, the following preferences were different:

- \* There is no need to touch a door or a frame of a door in passing through the door. (In the fundamental way, the VIP prefers to touch a door or a frame of a door.)
- \* Touching the backrest of a chair by one hand is enough to know the chair. (In the fundamental way, the VIP prefers to touch the backrest and the seat surface using both hands sequentially.)
- \* There is no need to stop before stairs. (In the fundamental way, the VIP prefers to stop just before the stairs, and be informed of its shape e.g., "upper stairs" or "lower stairs".)
- \* There is no need to touch a door or a frame of an elevator on entering or exiting it. (In the fundamental way, the VIP prefers to touch a door or a frame of a elevator.)

## **Experiments for Flexible Guide-Help Techniques**

Four scenes were selected for experiments based on the previous preferences: Passing through a door, taking a chair, using stairs, and using an elevator. We used three VIPs as subjects of our experiment:

a guide dog user, a VIP borrowing a GH's shoulder, and a white cane user. A veteran GH (Mr. Murakami, an author of the textbook, and president of NPO Shirogame) guide-helped them, and these guide-helping scenes were recorded by video.

## Analysis of Flexible Guide-Help Techniques

It was found from the video images that VIPs sometimes use guide-help techniques which are different from the fundamental techniques for safety. Examples are as follows:

### (1) Door (Elevator is also similar)

VIPs, who want no touch of a door or its frame in passing through the door, can estimate the position of the door frame and move behind a GH in order not to bang themselves against the door frame. After passing through the door, they move away from the hinge-side in order not to bang themselves against the closing door. These movements are shown in Figure 1.



Fig.1 VIP's movements to avoid danger (2 examples)

A VIP touches the back of her fingers to a GH's flank when GH's guide-side elbow is away from his flank in order to hold the opened door. This touching makes it possible to keep the GH's body in sight.

### (2) Chair

VIPs who say "touching the backrest of the chair by one hand is enough," can know the position of a seat surface also, and move in front of the chair. However, the information of the direction of seating is helpful and it is more important to say the direction when the seat surface is not touched.

### (3) Stairs

A VIP who does not want to stop before stairs, is so sensitive that he quickly adapts to the vertical motion of his guide-side hand. However, another VIP changed her mind to, "stop before stairs is safer and preferable."

GHs should observe the above behavior of VIPs when different guide-help techniques are adopted.

## Conclusions

Flexible guide-help techniques which are different from the fundamental ones become clear for maintaining safety. In applying a flexible technique, a GH must observe the VIP's behavior avoiding danger, and sometimes inform about omitted procedures verbally. VIPs are also required to have techniques to avoid danger.