

## **Instructional Software for Trainers to Teach Sighted Guides of Visually-Impaired Travelers**

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### **Abstract:**

In the IMC12, we proposed a self-learning software to teach sighted guide techniques for visually-impaired travelers.

The techniques were developed by us (members of a non-profit organization, "Shirogame") based on practical experiments and consultation, and are safe and comfortable, even for persons who have recently lost their sight.

In Japan, there are many organizations which train sighted guides, called "Guide Helper" for visually-impaired persons. However, it is said that some trainers seldomly point out behavior of learners for improvement in practicing. The purpose of our work was to train many guide-helpers with the basic guide-help techniques. And it is to develop instructional software for trainers and to make it easy to access the software for trainers. This paper describes an advanced software package for trainers to check the behavior of learners of "Guide Help". We supposed that learners should have learned guide-help techniques applicable for newly blind persons.

Outline of the flow of the software is the following:

- (1) Selects one setting from typical settings; Taking a seat; Passing through a narrow space; Passing through a door; Using an elevator; Ascending and descending stairs; Using an escalator, Using transportation, etc.
- (2) Watch sighted guide-helper's behavior in the setting.
- (3) Choose body parts of the guide-helper for improvement about the behavior, if improvement is required.
- (4) Choose reason for the above choice.

(5) If the correct answers are chosen, the software user can get points and go to the next problem or return to the first setting screen. By solving one problem after another, the user can gradually watch the appropriate behavior of a guide-helper as a movie in the setting, and can understand the reason of the appropriate behavior.

(6) The software shows the user's score for correct answers.

As a result, the user can enjoy the software, like playing a game, and learn the view point of trainers for training guide-helpers.

## 1. Introduction

This paper describes instructional software for trainers to teach sighted guides (guide-helpers) of visually-impaired travelers.

In Japan, "Supporting Independence for People with Disabilities Law (SHOGAISYA JIRITSU SHIEN-HO)" took effect in October 2006. And a municipality (Cities, Towns and Villages) can designate organizations which can train sighted guides, called "Guide-Helper" for visually-impaired persons.

But there is wide variety about the actual contents of the training. The guide-help techniques which learners can learn about depend on the organizations. Some learners took several training courses for guide helper held with different organizations. Also, there are some complaints that some guide-help users felt bad, collided against objects, or fell onto a lower step. Therefore, the quality of the training courses for guide-helper becomes an issue.

We, members of the non-profit organization "Shirogame", have discussed guide-help techniques which can provide safe and comfortable guide-helps. And we set the following prerequisites for guide-help techniques in training guide helpers:

(1) Techniques can be applicable for the newly-blind who are anxious about going out.

(2) Techniques can be applicable for persons who cannot walk safely using a long white cane.

(3) Techniques can be applicable for persons who cannot stay safe by themselves while walking with a guide-helper.

(4) Safety first and comfort second.

As a result, we arranged guide-help techniques and published a book[1] .

Furthermore, we presented it as a learning software package in IMC12[2]. The NPO Shirogame has trained guide-helpers and conveyed the guide-help techniques written in the book[1]. And training courses by the NPO are held five times a year.

In order to reduce the range of the quality of guide-help techniques of trained guide-helpers, it is important that trainers should point out learners' behavior which can be improved, and advise and demonstrate a behavior following the basic guide-help techniques shown in [1]. And training courses for trainers to learn the above are important. Trainers in the NPO Shirogame attend workshops 2-3 times a year held by the NPO. However, they can hold only about five courses in a year.

The purpose of our work was to train many guide-helpers with the basic guide-help techniques. The purpose of this paper is to make it possible for trainers to consistently point out inappropriate behavior of people learning the guide-help techniques.

The software has nine typical settings in training. A user of the software selects one setting among them. In each setting, there are several scenes and each scene corresponds to the guide-helper's behavior to be checked. Each scene has one Flash movie and two questions on guide-helper's behavior. The user watches the movie and answers the questions and gets or loses points. The two questions gradually change to asking to point out body parts of the guide-helper and clarify the reason about the behavior to be improved. A user of the software can get 10 points when a correct choice is selected, or loses 5 points when a wrong choice is selected.

The software is useful for not only trainers but also those who want to learn basic guide-help techniques because users of the software can become aware of points where persons learning guide-help techniques should pay attention to.

Section 2 shows the approach to designing the software. Section 3 describes the software in detail. Section 4 gives comments and conclusions.

## 2. Approach to Designing the Software

The NPO Shirogame has held courses to train guide-helpers for six years. In the training courses, we have the following implicit knowledge:

- (1) There is a wide range of inappropriate guide-help behavior of learners, from causing tense moments to causing injuries to guide-help users (visually-impaired persons, VIPs).
- (2) When a learner gives inappropriate guide-help in training, an immediate suggestion by a trainer helps the learner to understand his/her faults.
- (3) When a learner gives many inappropriate guide-helps in training, suggestions by a trainer in chronological order make it easier to understand and reduce his/her faults.
- (4) Demonstration of a correct performance makes it easier for a learner to understand how to improve his/her behavior.
- (5) We call it guide-helper-and-user method, as one person in a pair plays the role of a guide-helper and the other person plays the role of the user (VIP) using an eye mask. The guide-helper-and-user method, done with frequent swapping, makes various combinations of pairs of learners, and each learner can strongly feel the difference caused by guide-help techniques, depending on the partner.

Mainly from the above implicit knowledge (1) to (3), we planed to develop assistive software with the following features: The source code of the software is written in HTML and JavaScript, and many people can play the software via the Internet.

Serious inappropriate behavior of a learner is selected, based on experiences of NPO Shirogame's training courses, so as to insure that a trainer will not escape the attention of the behavior and can point it out in chronological order.

We arranged for a pseudo-learner and pseudo-user to give a performance of inappropriate behavior, and the performance is recorded and converted to Flash movie in the source code. And a user of the software can watch the movie anytime. The scoring part of the source code is written in JavaScript, and the high score is saved as a Cookie and a user of the software can play it to get a higher score again and again.

### 3. Description of the software

The software has the following typical training settings:

1) Taking a seat, 2) Passing through a narrow space, 3) Passing through a door, 4) Using an elevator, 5) Ascending and descending stairs, 6) Using an escalator, 7) Using a taxi, 8) Using a bus, and 9) Using a train.

And a menu for languages such as Japanese, English or (German).

A user of the software selects one setting from them. In each setting, there are several scenes and each scene demonstrates to inappropriate behavior. A window of each scene consists of 4 frames, as shown in Fig.1.

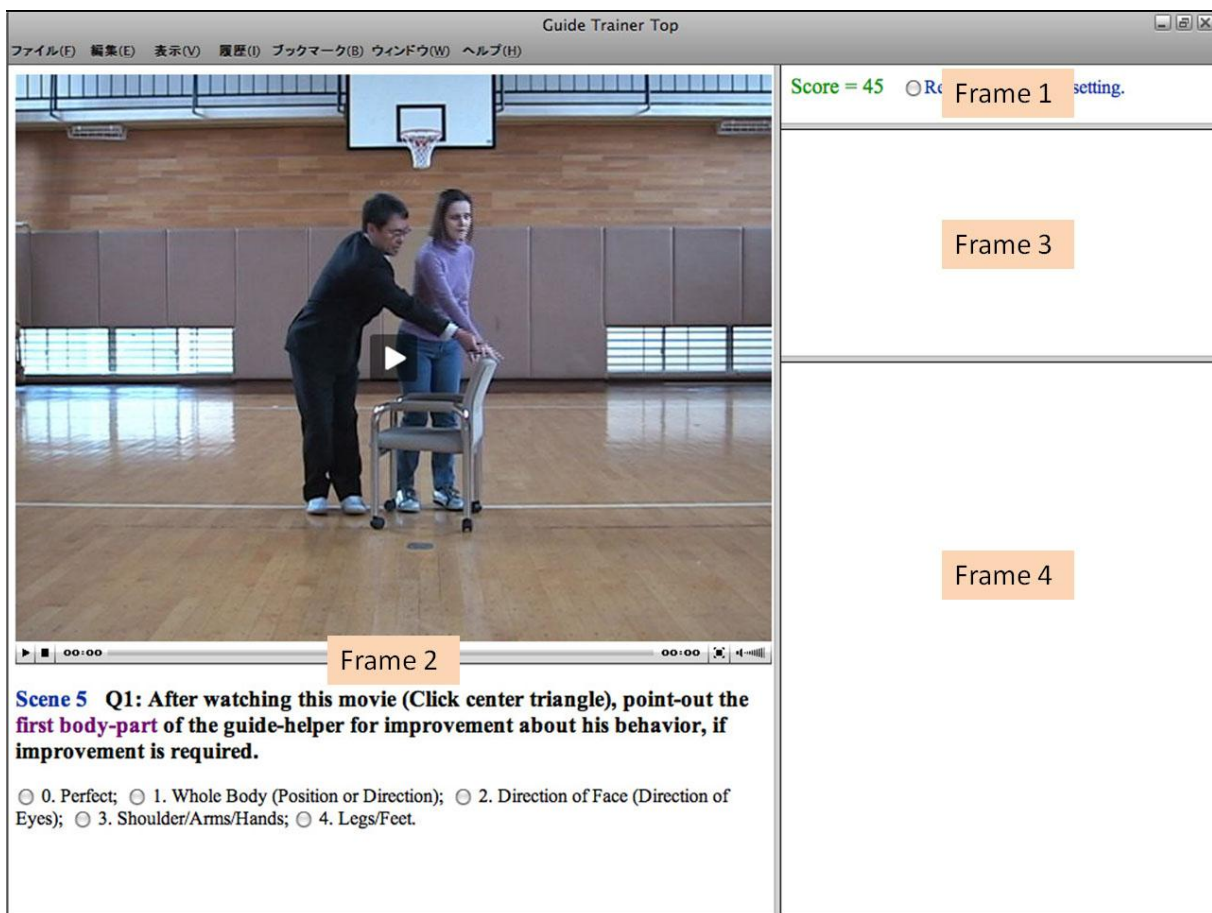


Fig.1 Each scene window consists of 4 frames.

Frame 1 usually shows both a score which a user of the software got in the setting and a radio-button for returning to the initial setting window.

Frame 2 shows the Flash movie and the first question. The user of the software can watch the movie anytime. The first question is asked to fix the first rough body-part of the guide-helper for improvement in the movie, and the user of the software selects one radio-button from among 5 choices, including "Perfect." The user should select the radio-button carefully, because each selection is scored.

After one radio-button is selected, the result of the selection is shown in Frame 3. If a wrong answer is selected, the software shows "Question 1: INCORRECT! -5 Points," and the five points are deducted from the score in Frame 1. If a correct answer is selected, the software shows "Question 1: CORRECT! +10 points," and the 10 points are added to the score in Frame 1. After the correct choice is selected, re-selection of choices gives no effect to the score, but just shows the result of the selection, whether incorrect or correct. And the second question is shown in Frame 3. The second question is asked in order to point out more detailed body-parts or the reason of inappropriate behavior of the guide-helper in the movie. The user of the software selects one radio-button from among several choices in Frame 3. The movie in Frame 2 can be watched again anytime.

After one radio-button for the second question in Frame 3 is selected, the result of the selection is shown in Frame 4. If a wrong answer is selected, the five points are deducted from the score in Frame 1. If a correct answer is selected, the 10 points are added to the score in Frame 1. And detailed reasons and comments for the inappropriate behavior in the movie are also shown, and sometimes the reasons are shown by another movie in Frame4, as in Fig.2.

Guide Trainer Top

ファイル(F) 編集(E) 表示(V) 履歴(I) ブックマーク(B) ウィンドウ(W) ヘルプ(H)

Score = 60  Return to the initial setting.

**Question 1: CORRECT! +10 Points.**

**Q2: Why do you think so?**

1. Position where the GH led the VIP's hand was inappropriate.

2. The GH should lead the VIP's Free-Hand first.

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**Question 2: CORRECT! +10 Points.**

**The GH should lead the VIP's Free-Hand first.**

The reason will be clear soon. The GH stands in the wrong position and leads the U's Guide-Hand only which might cause the following risk.

**Scene 5 Q1: After watching this movie (Click center triangle), point-out the first body-part of the guide-helper for improvement about his behavior, if improvement is required.**

0. Perfect;  1. Whole Body (Position or Direction);  2. Direction of Face (Direction of Eyes);  3. Shoulder/Arms/Hands;  4. Legs/Feet.

Go to the next scene.

Figure 2 An example of a reason is shown by another movie in Frame 4.

After a correct choice is selected, re-selection of choices gives no effect to the score, but just shows the result of the selection, whether incorrect or correct. And it shows a radio-button to go to the next scene. (A radio-button for returning to the initial setting screen is always shown in Frame 1.)

#### 4. Comments and Conclusions

We started to develop the software presented at IMC12

<http://shirogame.cool.ne.jp/YoudouM/top.cgi>

in 2000. At that time, guide-help scenes were constructed with several static images because the Internet-user connected via the telephone-line can watch the scenes.

This makes it easy to connect and modify static images. However, the motion of the guide-helper and his/her user (VIP) are unnatural because of wooden movements.

On the other hand, this software

<http://shirogame.com/GuideT/Top.html>

uses Flash movies because the Internet connection speed has become much higher. A user of this software can watch the behavior of the guide-helper and his/her user (VIP) as if real. And the user can check the speed and detail movement of the guide-helper.

The software is useful for not only trainers but also those who want to learn the basic guide-help techniques because users of the software can know the points where learners should pay attention to. And some users were able to enjoy the software with movies very much.

The software makes it possible for trainers to learn typical inappropriate behavior of learners of guide-help techniques. Trainers can point-out inappropriate behavior of learners promptly and consistently. In order to learn guide-help techniques, it is useful to have knowledge of inappropriate behavior. This software is useful for not only trainers who are training guide-helpers but also learners who are learning the basic guide-help techniques.

The software doesn't have real voices for the guide-help. Experts of the guide-helpers actually need to tune the basic guide-help techniques to their users' (VIPs') responses. And this applied technique is at an advanced level. Further work is underway to expand the software for having actual voice information in the movie and for advanced guide-help techniques.

## References

- [1] T. Murakami, I. Sekita: Fundamentals of Guide-Help --- From Beginners to Experts --- , Second Edition, Bunkodo (2009) (in Japanese).
- [2] I. Sekita, N. Sato, Y. Uchida, T. Murakami, H. Shishido, T. Sakai, R. Endo, C. Mashiko, M. Ishikawa, Y. Chiba, N. Yamaguchi, T. Higuchi: Instructional software for sighted guides of visually-impaired travelers, Proc. of 12th Int. Mobility Conf. (Nov 2006).