A Suggestive Recommendation Method to Make Tourists "Feel like going"

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Abstract: Stroll becomes a major style of sightseeing. Most conventional systems for navigation or recommendation of sightseeing spots in such sightseeing style support efficient sightseeing by giving users detailed information of spots or routes. However, such detailed information may restrict movement and chance of discoveries for tourists. It is supposed that if tourists walk freely in a sightseeing area then they discover their favorite spots by themselves. Such experience may remain in tourists' memories more strongly than that in which they visited recommended spots. Accordingly, our goal is to propose a system which shows recommended spots in a suggestive way. That is, our system gives a chance to walk to a direction of recommended spots, does not recommend a spot or a route to the spot obviously. In this paper, we consider how to provide information about spots on a map to make tourists feel like going to the direction on their own will. More precisely, we propose abstraction level of information about spots. The less information is inconvenience, the more opportunities for discoveries may be given to tourists. As a result of experiments, it was demonstrated that a medium-level of abstraction has a good balance of guidance and free activity.

Keywords: User Interfaces, Suggestive Methods, Recommendation, Support Systems, Tourists

1. INTRODUCTION

1.1 Background

The tourism industry has grown on a mass global scale in recent years, and has a significant role to play in the industrial activities of modern society. In Japan, economic expectation toward tourism are also rising, and various measures have been implemented for the realization of a tourism-oriented country. That is, tourism is expected to be one of the key industries of the twenty-first century.

In the previous tourism trends, many tourists participated in tourism where all of a destination, route, and time were predetermined by a travel agency. However, in recent years, many tourists decide on their destinations and route by themselves and enjoy their trip freely. One of reasons for this is that sharing information has become popular among the general population due to the spread of web services. Tourists are easily able to obtain information about their destinations in advance because much information are posted by others on web services. Ishimori (2001) says that tourism conducted in this way is called "autonomous tourism", whereby tourists design their own itineraries to their preference. In other words, the present trend is for tourists to visit their preferred places at their preferred times.

However, many navigation systems for sightseeing that have been developed in recent years place a high value on efficiency. One of the example is the showing the shortest route to a destination. Another example is the recommendation of route based on information sharing on web services. Lucchese et al. (2012) and Lu et al. (2010) have devised algorithms for personalized route recommendation in tourist destinations utilizing photos posted on photo-sharing sites, for example flickr (2004) and Panoramio (2005). It is very convenient for tourists who visit a sightseeing spot that they are unfamiliar with. However, tourists who use such systems only follow the route proposed by the system, and opportunities for new discoveries in the sightseeing spots by enjoying strolling within the available time decrease.

It is certainly convenient for tourists to obtain a variety of information before sightseeing. However, Maeda et al. (2006) says that the best part of sightseeing is to discover something unique to the destination and to experience it. In addition, attractive tourist destinations tend to vary depending on the circumstances of the moment, such as changes in seasonal scenery and weather. That is to say, we can indicate the possibility of missing out on interesting tourist attractions in the locality due to the tourism plan being restricted by the recommendation in advance.

It is supposed that if tourists walk freely in a sightseeing area then they discover their favorite spots by themselves. Such experience may remain in tourists' memories more strongly than that in which they visited recommended spots. However, if tourists have no information about spots, they act only on their own preference. That is, no support by a system may give free activity to tourists, but the fact remains that no recommendation by a system also restrict the possibility of new discoveries for tourists.

1.2 Our contribution

Accordingly, our goal is to propose a system which gives both of free sightseeing and recommendation of spots. That is, our system shows recommended spots in a suggestive way, i.e., give a chance to walk to a direction of a recommended spot, does not recommend a spot or a route to the spot obviously. Not to restrict activity of tourists, the system should not provide the detailed information about routes or recommended spots. In this paper, we consider the least amount of information about spots and how to provide the information on a map to make tourists feel like going to the direction on their own will. More precisely, we propose abstraction levels of information about spots. For example, as for positions of spots, we set four levels, a point, a direction, an area and no information.

The less information is inconvenience, but it may give opportunities for discoveries to tourists because their movement does not restricted by a predetermined plan. As a result of experiments, it was demonstrated that a medium-level of abstraction has a good balance of guidance and free activity.

A brief outline of this paper is as follows. In Section 2, we introduce other research related this study. Sections 3 describes our system proposal and system. Section 4 describes an evaluation of the system and consideration. Finally, we state our conclusions in Section 5.

2. RELATED WORKS

In the research area about navigation systems, there are some studies that try to give tourists chances of new discoveries by restricting information given to the tourists. These systems are based on the theory of the "FUrther BENEfit of a Kind of Inconvenience" (FUBEN-EKI) explained in Kawakami and Hiraoka (2012), which suggests that inconvenient things bring benefits in some cases. With advances in information technology, the notion of "anytime, anywhere" is taken for granted in modern society. In such convenient society, there are benefits which are overlooked because of too much emphasis on efficiency. The studies focusing on FUBEN-EKI, for example Nozaki et al. (2013), try to find these benefits by creating inconvenience intentionally.

Nakatani and Ichikawa (2010) proposed a sightseeing navigation system in which a user writes a sightseeing plan and its routes by hand before his/her sightseeing, and then uses it as a reference during his/her sightseeing. Since the handwritten routes have many distortions, the user cannot know the exact routes on site. Tanaka and Nakatani (2010) proposed a navigation system which hides the map of area within a radius of 100 meters around the user in accordance with the users' movement. Moreover, Takagi et al. (2012) developed a system that navigates users only using information on direction and spots that are scattered throughout the tourist destination, without any detailed map information (Fig. 1). These systems restrict map information given to tourists in order to promote interaction with environment. If tourists have insufficient information about their routes, they try to find it by themselves. As a result, they can find new discoveries. In these navigation systems, they focus on the information about map (i.e.,
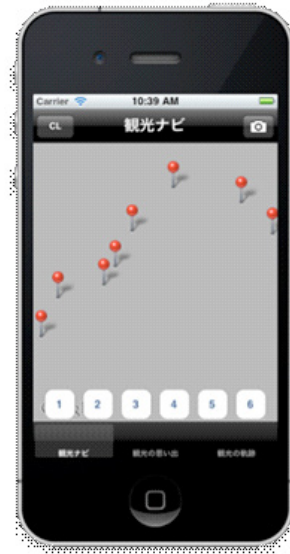

Fig. 1. An example of system screens in navigation system without route information

route), not landmarks or recommended spots. For spots, these systems show detailed information, that is, their locations, photos, or introductory sentences.

As for recommendation systems of sightseeing spots, there are studies that consider various conditions of spots or tourists. Oku et al. (2015) proposed the methods to recommend spots based on posted information (e.g., tweets in Twitter, or photos taken in the spots). Sugiura et al. (2014) evaluated the effect of the sightseeing application for smart phones which provides spots in Kyoto based on the current feelings of the tourists. However, these studies focus on which spots should be recommended to users at the time, but how to provide the information about the recommended spots. In the most of previous studies about recommendation systems, the detailed information about the recommended spots, such as their names, locations and photos are given to users.

Our goal is to provide some information in order to make tourists "feel like going", rather than the detailed information about the recommended spots. That is, we provide just a trigger to change their movement. Shikakeology, proposed in Matsumura et al. (2015), is the design method in which suggestive triggers change human behaviors or consciousness. "Nudge", explained in Yamane (2014), is one of the weakest triggers in Shikakeology. Nudge gently encourages human to take a particular decision or action. In the Shikakeology and Nudge, triggers do not prevent free behavior of users, and encourage them to a desired configuration. Our proposed system is the same concept of Nudge.

Kurata (2012) proposed the sightseeing support system, "Potential-of-Interest Maps", which have the similar characteristic to our purpose. The system visualizes the degree of attraction of tourist destinations at each spot from the vast amounts of information that have been posted on photo-sharing sites. That is, the area of which more photos are posted to the site are illustrated by deeper red. Users can know that the area has attracted attention of others, but cannot know what spots is in the area.