

A STUDY OF A NAVIGATION SYSTEM THAT INDUCES TOURISTS TO VISIT SIGHTSEEING SPOTS AGAIN VIA A FEELING OF REGRET

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ABSTRACT

Increasing the tourists is important at sightseeing spots. There are two types of reasons people visit sightseeing spots again: Because they are particularly interesting or something interesting was overlooked. The latter is based on a “feeling of regret.” The feeling of regret can actually change people’s behavior. The feeling of regret involves the difference between the ideal and reality, and the difference between the effort they put in and whether it feels successful or not. In psychology the Zeigarnik effect [1] states that people remember “unfinished or interrupted” tasks better than those they have completed. With sightseeing we consider the Zeigarnik effect to be involved in something a person wished to view or visit but couldn’t. We predict the effect could be used induce people to want another chance, or that is, we think that they will wish to visit the relevant sightseeing spot again. The system proposed in this paper provides pictures and information in a gradual manner. In this paper we suggest how to get people to visit sightseeing spots again through the creation of “their sightseeing having been incomplete”. An experiment to evaluate the proposed prototype system was performed in Kyoto. The evaluation experiment took place in the middle of January in 2011. As a result, the test subjects were felt a regret by providing pictures using a temporal difference and a spatial difference, we confirm the efficacy of the study.

KEYWORDS

Zeigarnik effect, Sightseeing, Navigation system

1. INTRODUCTION

1.1 Background

Sightseeing is a global business and forms a big market in Japan. According to the World Tourism Organization (WTO) the number of global tourists totaled 25 million people in 1950, 69 million in 1960, 159 million in 1970, 287 million in 1980, 455 million in 1990, and 700 million in 2000. It is now being predicted that the tourist market will increase from here on in [2]. Sightseeing has been gaining attention in Japan because it will increase consumption and employment. The “Tourism-based Country Promotion Basic Act” was enforced on January 2007, with the Japan Tourism Agency having been organized to materialize a Tourism-based Country. This is being evaluated as being the pillar of a very important policy, or that is, a concern about sightseeing has been growing in recent years both globally and in Japan.

Package tours made available by travel agencies are widely used but with tourists deciding their own routes and plans and not using package tours having grown in popularity in recent years. That type of sightseeing is considered to be “Autonomous Sightseeing.” In recent years people deciding a travel plan using information they have accessed has led to the expectation that “Autonomous Sightseeing” rather than “Heteronomous Sightseeing” will increase in popularity [3]. Development of information service on the internet promotes this tendency. Short tours are being focused upon by young businessmen and women, with an increase in the number of people that enjoy the planning process.

The sightseeing scene in recent year has thus been changing, therefore making a direct connection between tourists and sightseeing spots important.

The common point of sightseeing resources has the feature that “timing” of a visit raises more charm of the sightseeing element. Natural landscape changing every season and the event and the festival which are held only at decided time are the sightseeing resources with the high rarity more than the historical building and the streets which can be seen anytime. “Getting rare timing” is getting the interest of a repeater tourist. So, the timely event induces revisit as a repeater in a sightseeing spot and timely provision of events information is important. It is desired to use a tool using a sightseeing navigator and devise how to show it a sightseeing element as well as a device on the host side of the tourist spot [4].

1.2 Related Research

1.2.1 Sightseeing Navigation System Based on Benefit of Inconvenience

Systems used to cut down on labor have been actively developed with the rise of technology in recent years. However, those technologies have also given rise to several problems as greater convenience has a negative side to it too. For example, face to face encounters are lost when people meet each other over the internet. The “benefit of inconvenience” is thus attracting attention. If we regard convenience to be less work we can also discover other benefits beside doing away with grudge work [5].

Several studies were made on sightseeing navigation systems that are based on the benefit of inconvenience by Ken Tanaka and Kanako Ichikawa. These studies emphasize a “sense of fun” and suggest a tourist navigation system that intentionally limits route information.

Confirmation took place on what interactions with the environment should be promoted by Kanako Ichikawa drawing up a sightseeing plan using an electronic map before the actual sightseeing took place, and deleting the electronic map on the sightseeing day, then only showing a rough sightseeing plan and their current position via GPS (Global Positioning System) (Figure 1) [6]. This induces accidental encounters occurring.

Ken Tanaka’s study does not support the most efficient sightseeing and instead sightseeing that can be leisurely enjoyed. In this system, the map around an user disappears as the user moves around. The effectiveness of it was then tested in assessment experiments utilizing a subject (Figure 2) [7].

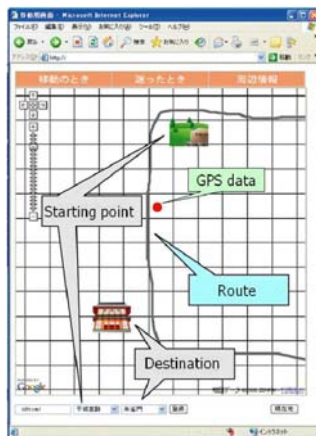


Figure 1. Tourist Navigation System (Ichikawa)

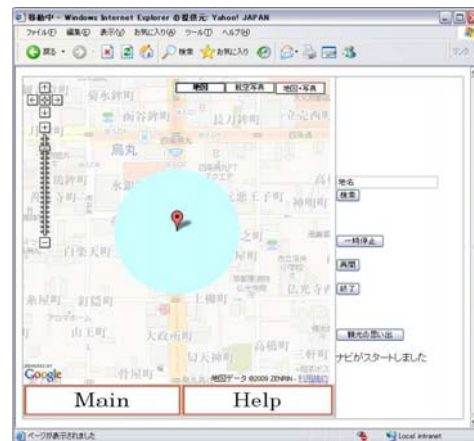


Figure 2. Tourist Navigation System (Tanaka)

1.2.2 Zeigarnik Effect

People have a variety of feelings, with a particular feeling that tends to be related to behavior and remain for a long period of time being a “feeling of regret.” The feeling of regret can actually change people’s behavior. The feeling of regret involves the difference between the ideal and reality, and the difference between the effort they put in and whether it feels successful or not. It is a given fact that being serious about a task is related to the next action people take in such a situation. We often experience a feeling of regret because of the seriousness we consider a task to have [1].

The influence that regret has on people in psychology and behavior was studied by the Russian psychologist Bluma Zeigarnik. She discovered that unfinished or interrupted actions remain in the memory better than those completed.

With sightseeing we consider the Zeigarnik effect to be involved in something a person wished to view or visit but couldn't. We predict the effect could be used induce people to want another chance, or that is, we think that they will wish to visit the relevant sightseeing spot again.

Some studies have focused on the benefit of inconvenience but our study considers not only the benefit of inconvenience but also the Zeigarnik effect.

2. SYSTEM ARCHITECTURE

2.1 Approach of this Study

A number of efficient sightseeing navigation systems have been developed for use in the field of sightseeing but a system to induce people to visit sightseeing spots again has yet to have been developed, which needs to include the following:

- 1) Support for chances and discoveries based on the benefit of inconvenience
- 2) Induction of tourists' revisit to sightseeing spots

We have developed a system incorporating the above.

Anyone walking around sightseeing spots can possibly make new discoveries. The system in this study allows tourists to imagine the enjoyable things they could discover if they were to visit a spot at the right time by removing times and seasons from the picture. When tourists arrive at a goal the system displays pictures that they can't see at the sightseeing spots on the map, thus inducing a feeling of regret in the users. They would then think "I want to come here again." They cannot fulfill the imagined sightseeing because of the different time and space, or that is, it remains "unfinished sightseeing." They feel regret about the unfinished experience, and will thus probably wish to visit to the sightseeing spot again.

2.2 System

This study involves obtaining GPS data and providing information this is only viewable on sight via utilization of iPhones. The application language used was Objective-C. We considered the language to suit our system because it includes a method of setting the distance between the present location and the goal.

An outline of the system is provided below.

1) GPS data is updated at equal distances. When the user approaches the destination, which includes registered picture information, the system provides a picture of the object of interest but shifts in time slightly in some pictures.

2) The users attempt to find the place the picture depicts, and can often be near it. They search for the destination by checking the distance between their present location and the destination via use of changing colors. The color changes from "blue-yellow-green-red" over distance.

3) The same scenery as the picture is impossible to view because of a few differences between the most suitable time and the present exist with the same spot as in the picture. The system thus induces a feeling of regret.

4) After the user arrives at the destination pictures of sightseeing spots they did not visit but were near are displayed on a map based on GPS data. If they have no time to return to that place the system again induces a feeling of regret.

2.2.1 Main Screen

The main screen displays pictures that have been shifted in time slightly. If the system shows pictures they are interested in they cannot see the same view as in the picture, however, thus leading to a feeling of regret. The important point is that the time is slightly different. If the picture's timeframe has been shifted too much users tend to feel resignation rather than regret. The important point is what degree of time slip produces the

most regret. We propose the hypothesis below because we have no psychographic or cognitive science knowledge.

- 1) In the case of a seasonal event the previous or following season's picture is displayed. For example, if spring is the best season early spring (end of winter) or early summer.
- 2) In the case of a weekly event the previous or following week's pictures is displayed.
- 3) In the case of a daily event the previous or following day's picture is displayed.
- 4) We imagine that the picture of the previous time's event is better than the following in inducing a feeling of regret.

The system displays pictures selected based on the above standards.

The main screen displays GPS data, buttons, pictures, and colors (Figure 3). Users can select an object of interest using the buttons. The system changes behavior when objects of interest are selected. The reason that users need to select objects of interest is that places they are not interested will not induce a feeling of regret. The system then utilizes GPS data and the objects of interest to display pictures when the user is near the destination. Users look for the same place, survey the scenery, and then enjoy viewing the scenery. When the users arrive at the destination they notice a difference between the picture and the sightseeing spot they are viewing, leading to a feeling of regret.

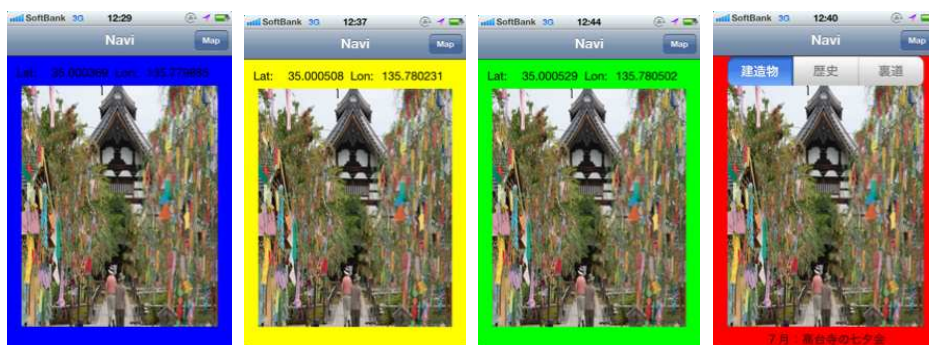


Figure 3. Main screen

Over the past few years several studies have been made on sightseeing navigation systems that are based on the benefit of inconvenience. The studies then revealed the problem of a feeling of insecurity.

This study therefore depicts the distance from the present position to the goal using colors (Figure 3). When the distance is 100 meters the system shows a picture within a blue frame, as in Figure 3. The colors then change through the sequence of “blue-yellow-green-red” as users approach the destination. The distance from the present position to the destination uses colors because colors are more intuitive than numbers, and we wish to enable users to feel a sense of pleasure.

2.2.2 Sub Screen

The sub screen displays a map and information on a sightseeing spot they did not visit but were near to (Figure 4).

The sub screen also shows their route using red pins on an electronic map.

The system utilizes GPS data and any objects of interest to display trackside sightseeing spots that the users did not visit using green pins on the electronic map. The system displays a popup window if the users touch the green pin through which they gain information on that sightseeing spot. The system shows a picture of the sightseeing spot if users then touch the detail-button in the popup window. The “Trackside sightseeing spots” in this study were set to be within 100 meters of the user's route. 100 meters was considered the most suitable in enabling the users to feel “I could have deviated from my route and dropped in at the spot, but didn't.” We predict that a feeling of regret will be induced in users from this feature.

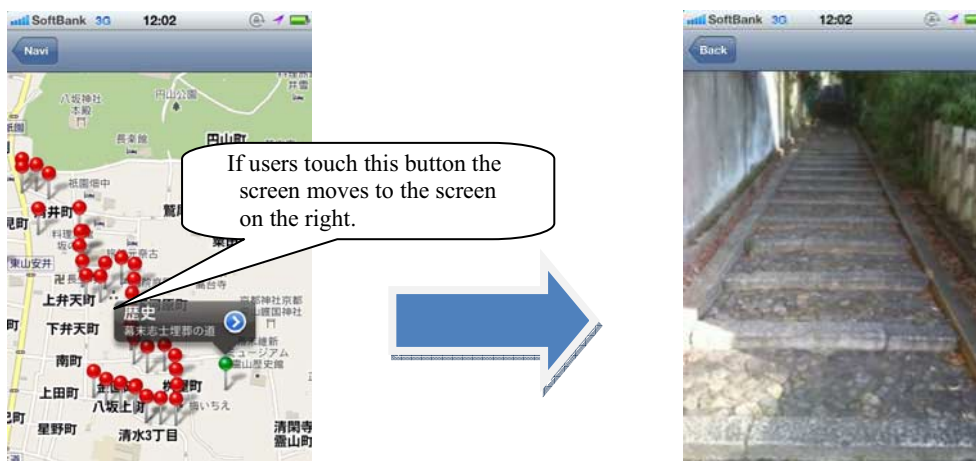


Figure 4. Sub screen

The green pin only displays once the users have arrived at the destination shown on the main screen. If the users do not reach the destination they will not be able to view the trackside sightseeing spots they did not visit because the green pin will vanish.

The system enables the situation where users can't look for the spot by removing the information on it, thus also inducing a feeling of regret.

3. EVALUATION

An experiment to evaluate the proposed system was performed on 7 subjects. The evaluation experiment took place in the middle of January in 2011, and is described below.

3.1 Experiment

An area around Kiyomizu temple in Higashiyama-ku, Kyoto, was used in the experiment.

The test subjects were 7 people of their 20's who live in the Kansai area. They were divided into three groups on the basis of the objects of interest (Table 1). They selected two subjects from history, buildings, and back roads. Table 1 provides information on objects of interest.

Table 1. Grouping and the attribute of the test subjects

	Group 1	Group 2	Group 3
Number of people	2	3	2
Object of interest	Buildings	History	Back roads
Ratio of males to females (men: women)	1:1	1:2	1:1

The test subjects went sightseeing equipped with iPhones. We went with them to thus be able to observe them. When they arrived at the goal we directed them to view the sub screen. The sub screen displayed information on a sightseeing spot they did not visit but were near.

After the sightseeing the test subjects were provided with questionnaires.

3.2 Experimental Results

The 3 groups enjoyed going sightseeing. Figures 5, 6, and 7 show the routes of each group. The yellow circle in the picture marks where the picture has been slightly shifted in time. The purple circle in the picture marks the goal. Figures 8, 9, and 10 show pictures with slight time shifts. Figure 8 shows a picture half a year later, Figure 9 1 month later, and Figure 10 1 month prior.



Figure 5. Route of Group 1



Figure 8. Picture slightly shifted in time (buildings)



Figure 6. Route of Group 2



Figure 9. Picture slightly shifted in time (history)



Figure 7. Route of Group 3



Figure 10. Picture slightly shifted in time (back roads)

3.2.1 Considerations with Benefit of Inconvenience

The difference between the current position and destination was depicted using colors the system navigation based on the benefit of inconvenience. We predicted that most people would prefer to view the environment this way.

We took a look lost on way on Figures 5, 6, and 7. Interaction can be expected which asked a person the current way and look around attentively to be lost [7].

We asked whether the time to view the system screen while moving around or sightseeing using a map and tour guide would take more time the bottom, which was then judged using an ascending scale of 1 to 5 (short-1, long-5), leading to the discovery that using the system took less time than using a map and a tour guide. One of the reasons for that was it proved easier to understand the connection between the current position and the goal when depicted with colors, which led to less time being required.

Moreover, they also answered a questionnaire on how it felt to search for a destination using only a picture on an ascending scale of 1 to 5 and a “feeling of anxiety”, “level of difficulty”, and “amusingness”, with the averages being provided below.

Feeling of anxiety (anxiety-5, reassurance-1)	3.28
Level of difficulty (difficult-5, easy-1)	3.85
Amusingness (amusing-5, not amusing-1)	4.85

The value of "Amusingness" was high at 4.85, although feelings of anxiety and difficulty were also present. This then led to the consideration of why it was possible to feel "amusement" but also anxiety and difficult. To the question “How did it feel searching for a destination using a picture and the distance?” they answered “I didn't know the way, but it was fun to search for it,” “I slightly detoured but still got there,” and “It's fun because it is introduced an element of chance.” They thus presumably enjoyed the element of chance which incorporated anxiety and the opportunity to make an accidental discovery. The answer about making an impression on them in this sightseeing were as in the sunset in Kyoto which was found near the goal and the building and the lane they did not know so far. These are the encounters with “accidental discoveries” which can't be met for conventional sightseeing. It can be said a destination using only a picture and colors induced an “accidental discovery” and “amusement” which can go sightseeing as thought it were a game.

3.2.2 Consideration about the Degree of "regret" from the Temporal Difference

The time of the pictures of 3 the destinations were shifted:

- To one month later (history)
- To one month prior (back roads)
- To half a year later (buildings)

*Inside the () gives the objects of interest.

In this way we examined the resulting feeling from the test objects being shifted in time. We questioned them on the degree of regret the objects of interest they gone to induced, with the answers being provided below.

Table 2. Destination and number of people that answered made an impression

	Objects of interest	Number of people that answered made an impression
Group 1	History	1
	Buildings	1
Group 2	Back roads	3
	History	0
Group 3	Buildings	0
	Back roads	2

Before the experiment we assumed that a later event would induce a feeling of regret, but we could not define a causal relationship. The reason for that is because the impact of a picture was stronger than the impact of timeframe being slightly shifted.

However, the answers made us more aware of how a shift in time has an effect. The answers included “If I came here a month ago I could have seen the Hana-touro,” and “I should have come here a little earlier.” All the test subjects said they wished to visit there again, thus affirming that the picture being shifted in time resulted in a feeling of regret.

3.2.3 Consideration about the Validity of A Spatial Difference

The system displays a map and information of a sightseeing spot they did not visit and but were near to only after they have arrived at the destination. We requested their impressions of the spot near to the test objects.

They explicitly answered that the spot left them with an impression, which is considered to trigger another sightseeing excursion. Many of them stated that they would to have stopped at the spot if they had more time.

The most important problem to induce them to think about visiting again by ensuring they did not complete the sightseeing. Group 1 couldn't find the spot, even though they did search for it. They very clearly mentioned they felt regretful that they couldn't find it, thus leading to the prediction that regret of not having found a spot would trigger sightseeing there again. The timing and display time thus suit inducing a feeling of regret, and we can be sure that consideration of the validity of a spatial difference exists.

4. FUTURE WORKS

Various problems were discovered in this study, including the difficulty of ascertaining the feeling induced from the shift in time with the test objects, which will be studied from here on in. We will also add a vibration function to the system so that the change in color can be understood to have occurred even if the screen is not being viewed. We think the system can be a useful tool for use in connecting sightseeing spots and tourists over a network.

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