## System to Support Tourists' Excursion Behavior Using Augmented Reality

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In recent Japan, information related to tourism can be obtained through the Internet in addition to conventional methods such as magazines and guidebooks. The Internet has become the main source of information when planning a sightseeing trip or searching for information concerning sightseeing spots. However, due to the quantity and variety of information available, it has become difficult to select and obtain suitable information according to the users' needs. As there is an especially large amount of information submitted and released concerning sightseeing spots in urban areas, which makes it difficult for those with limited knowledge or sense of locality to efficiently obtain the necessary information, the need for a recommendation system to help users find suitable information is becoming greater.

On the other hand, though there are important conditions when deciding on a location to visit, such conditions are not always the same and may change according to the circumstances. Additionally, when sightseeing with a group, the issue is how to suitably reflect the preferences of each member of the group when deciding on where to visit. Based on the background mentioned above, the present study aims to develop a sightseeing spot recommendation system for urban sightseeing spots in order to support individual as well as group sightseeing activities while taking into consideration the user's needs which can change according to the circumstances. The circumstances of the users is defined as the important conditions and sightseeing unit (individuals or groups). More specifically, the present study will design and develop a system that is an integration of the Web-GIS, pairing system, evaluation system and the recommendation system. Furthermore, the operation and evaluation of the developed system will be conducted, and an improvement measures will be extracted.

The conclusion of this study can be summarized into three points as shown below.

- (1) In order to support tourists' excursion behaviors by integrating SNS, Twitter, Web-GIS, recommendation system, and (1) In order to support sightseeing activities by reflecting the changes of priority conditions concerning the sightseeing spots as well as the different preferences within the groups when recommending sightseeing spots, a system which integrated the Web-GIS, the pairing system, the evaluation system and the recommendation system was designed and developed. By doing so, the reduction of the burden when obtaining information, the adaption to changes in needs when sightseeing and the unification of the preferences of all users within a group were made possible. The central part of Yokohama City in Kanagawa Prefecture, Japan was chosen as the operation target area, and the system operation and evaluation were conducted.
- (2) The operation of the system was conducted over a period of 4 weeks targeting those inside and outside the operation target area, and a web questionnaire survey was conducted towards all users. Based on the results of the web questionnaire survey, the usefulness of the system when sightseeing was high, and the further use of each function can be expected by continuous operation. Especially for the group registration function and the evaluation function of sightseeing spots, there is a possibility that they will be used more fully by the continuous operation of the system, and this will improve the usefulness of the system when sightseeing. The recommendation function of sightseeing spots, which is an original

function of the system, has received mainly good ratings, and if the group registration function is used more often, there is a possibility that the suitability of sightseeing spots recommended to groups will improve.

(3) From the results of access analysis of users' log data, it is evident that the system has been used by different types of devices just as it was designed for, and that the system has been used according to the purpose of the present study, which is to support the sightseeing activities of users. However, only a few used the group registration function or changed their preferences after the initial registration. Such issues may be improved by the long-term operation of the system. Therefore, on the next step of the present study, it is necessary to inspect this point by the even more long-term operation of the system.

Keywords: Sightseeing Spot Recommendation System, Web-GIS, Pairing System, Evaluation System, SNS (Social Networking Service), Circumstances of Users

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