Automatic Modeling of User's Real World Activities and Its Application

The mobile Internet is expanding dramatically, such as the number of subscribers and the volume of mobile contents. As the mobile Internet gains in popularity, information retrieval must be made easier and more efficient. Towards this goal, we investigate the automatic modeling of users' real world activities from the web. Concretely, to estimate the hierarchical relationships present in the activity model with the lowest possible error rate, we propose a method that divides the representation of activities into a noun part and a verb part, and calculates the mutual information between them[1][2]. The result shows almost 80% of the hierarchical relationships can be captured by the proposed method. Fig,1 shows learned task-model.

In our research, we incorporate learned task-model into content-based recommendation algorithm, by representing both content profile and user's profile by set of learned tasks[3]. From the user test, the obtained precision-recall curve is higher than that obtained by existing content-based recommendation algorithm which uses noun-based features for both user profile and content profile.

In addition, we have incorporated learned task into map interface for mobile video navigation[4]. This interface allows the user to find videos that are related to the activities around the user's current location (Fig.2). Activities are expressed by pairs of sightseeing spot names and 3,300 kinds of verbs extracted from the Blog. A user's evaluation test shows that the proposed interface increases the number of videos watched by about 3 contents compared to video linked map interface by Google in 40 minutes user test. Especially at the area where user has never visited, number of videos watched increases twice, and this shows the efficiency to make user interested in unknown place through mobile video navigation.

Keywords: Web mining, task model, recommendation, semantic search

References

1) Yusuke Fukazawa, Jun Ota: Automatic Modeling of User's Real World Activities from the Web for Semantic IR, 19th Int. World Wide Web Conference WWW2010, Semantic Search Workshop, 2010.
2) Yusuke Fukazawa, Jun Ota: Extraction of Hierarchical Relation between User's Activity based on Enhanced PMI-IR, JSAI 2010, 2010.
3) Yusuke Fukazawa, Jun Ota: User-centered Profile Representation for Recommendation on Multiple Content Domain, Journal of Knowledge-based and Intelligent Engineering Systems, under review.
4) Yusuke Fukazawa, Jun Ota: TaskGuideRoid: Activity-Linked Map Interface for Mobile Video Navigation, MobileHCI2010, under review.

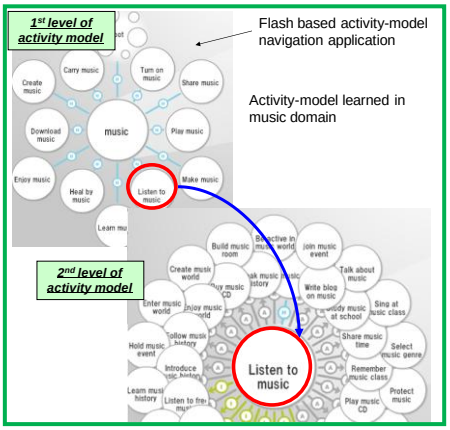

Fig.1 Learned Activity model

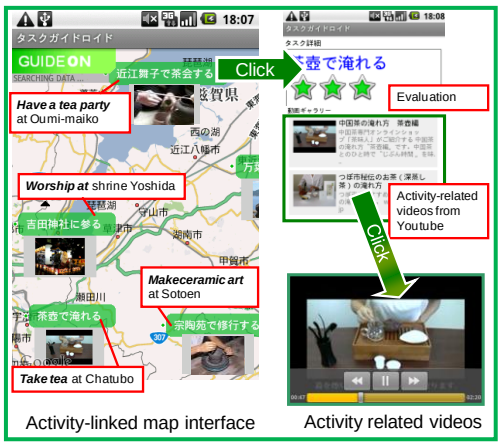

Fig.2 TaskGuideRoid's main screen image