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

The mobile Internet is expanding dramatically with the increase in the number of subscribers and the volume of mobile contents. As the mobile Internet gains popularity, information retrieval must be made easy and efficient. Thus, we investigate the automatic modeling of users' real world activities from the web. 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 that almost 80% of this relationships can be captured by the proposed method. Fig.1 shows a learned task-model. In our research, we incorporate this model into a content-based recommendation algorithm by representing both the content profile and user profile by a set of learned tasks [3]. From the user test, the obtained precision-recall curve is higher than that obtained by an existing content-based recommendation algorithm which uses noun-based features for both the content and user profiles. In addition, we incorporate the learned task into a map interface for mobile video navigation [4], allowing a user to find videos related to the activities around his current location (Fig. 2). The 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 a video linked map interface by Google in a 40-minute test. In the area where a user has never visited, the number of videos watched increases twice showing the efficiency of the proposed interface to capture user interests in unknown places 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.

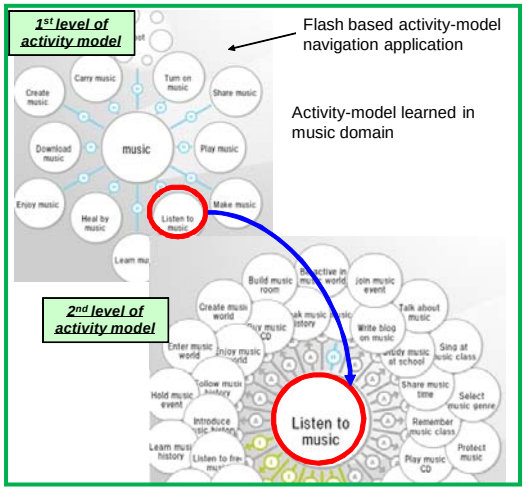

Fig.1 Learned activity model

Fig.2 TaskGuideRoid's main screen image