Recommending Topics from Rated Objects

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Abstract. This paper discusses recommending and presenting informative topics based on user ratings of objects. This mapping between and integrated presentation of ratable and informative components accelerates access to unfamiliar domains. We apply this to our example domain of museum collections by having users rate artefacts and then receive recommendations of relavant topics for further study. This process lets users quickly access personally appealing cultural heritage knowledge without prior understanding of how experts have named and organized it.

1 Introduction

Much current electronic access to cultural heritage requires the user to have previous knowledge of the field's terms and concepts. We present a system that, on the other hand, lets the user start by simply selecting which museum artefacts he or she likes from several screens of artefact images. Our system then determines which properties occur frequently in the user's selection. Next, it provides the user with a short list of links to presentations about the topics that these properties represent. The user can then browse to one of these displays, learn about its topic, and navigate to artefacts related to the topic. We enable this by distinguishing and mapping between objects, which are more quickly rated but less informative, and topics, which are more slowly rated but more informative.

For example, after the user selects artefacts from several displays, the system determines that the user tends to like artefacts created by Rembrandt. The system then provides the user with a link to a display about Rembrandt. This display provides information about Rembrandt himself, including a descriptive paragraph. It also provides links to the artefacts Rembrandt created.

2 Requirements and Methodology

The test should be as unobtrusive as possible to the user. One means of achieving this is to minimize the number of artefacts that the user must rate. This requires statistical analysis of the results after each test screen to see if there is already

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enough information to make confident recommendations. The system might also strategically select test objects for quicker determination of the user's taste.

The technologies we shall use include Semantic Web formats to represent the objects and their properties. The statistical analysis techniques we will apply include calculating the certainty of the precision and recall for the properties found to derive recommendations. Here, precision means the probability that each of these properties truly represents an interesting topic to the user. Recall in this context is a measure of certainty that a substantial portion of all properties have been tested enough.

We validate this system by performing a user study. This study will have first time users evaluate the recommendations they receive. Some users will be in a control group that uses the same interface and fills in the same evaluation as the study group but receives instead of recommendations a fixed list of topics based on the current website's top links. A higher evaluation from the study group than the control group will indicate success.

While the initial version of this system will present topics using static web pages for a fixed set of topic types, Semantic Web browsers hold potential for more flexible display of recommended topics. A Semantic Web browser would enable recommending properties of any type, including those recently added.

3 Contribution

This system's contribution to cultural heritage is that any user, including a novice, can quickly learn what topics of cultural heritage suit his or her tastes. Users will no longer need to face intimidating initial interfaces that require prior familiarity with cultural heritage concepts. The scientific contribution is that this technique recommends topics about objects rather than objects themselves. A unified interface integrates the presentation of these toipcs with the relevant objects, enabling users not only to see what they like but also to learn why.

This system's recommender technology will be readily or directly applicable to RDF code of any domain. Insights from use of this system into what types of properties best represent user taste may be useful for determining what type of data to enter into the data systems of the Rijksmuseum and other institutes. Furthermore, this system will create a user model that further work can extend. Finally, we may implement the shared user assignment of tags to artefacts and topics to increase personal involvement, stimulate social interaction and serve as an additional type of topic for recommendation from this technology.

A beta version of this system will be running by late October 2005. Its full version will be on the Web and performing user studies by mid-January 2006.

4 Acknowledgements