Implicit feedback-based discovery of student interests and educational object properties

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In the present, searching and recommendation on the web are becoming more and more common. Whether it concerns search and recommendation of articles in news and digital libraries, of study materials, or different products in e-shops, it is essential to know the characteristics of the objects being recommended, and the characteristics of the person manipulating these web objects. These characteristics are collected via implicit feedback. Inaccurate information, collected from evaluation of implicit feedback from human behavior, has significant influence on the accuracy of recommendation.

With the increasing possibilities of monitoring users on the web, like signals from eye tracking camera, blood pressure, body temperature and pulse sensors, we gain the ability to evaluate implicit feedback with great accuracy, and with that, gain the related interpretation of various signals of activity in different domains.

Despite the existing implicit methods of evaluation for various signals of user activity, which aim to explore its characteristics, there is still room for improvement. Our research is aimed at the attributes of users and educational objects with the use of implicit feedback indicators, and their interpretation for use in the domain of education. By the research of chosen implicit feedback indicators, individually and with each other, we will explore their mutual relations. We plan to monitor the user activity, while the users are studying. To support our approach, we identified the following basic implicit feedback indicators, which can provide us the overall picture of the users behavior:

- Number of scrolling on the page, the overall time of scrolling on the page
- The number of moving the page, the distance that the site was moved
- Different mouse movements
- The number of keystrokes
- The way of leaving the page

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- Time spent on the page, time to first click
- Gaze of the user
- Number of highlighting / copying individual pieces of text, size of highlighted / copied sections of text
- Annotation the text on the page
- The number of searches on the site

In this work, we plan an attempt to interpret the appropriate individual recorded signals of the user activity. Based on our findings we aim to improve the user model and to propose a method for the use of collected information in the domain of education on the web. Further, we plan to experimentally prove our findings in the context of educational objects and in the context of user modeling.

References

[1] Badi, R. et al.: Recognizing user interest and document value from reading and organizing activities in document triage. In: Proceedings of the 11th international conference on Intelligent User Interfaces - IUI '06, ACM, 2006, p. 218–225.

[2] Barla M.: Towards social-based user modeling and personalization. Information Sciences and Technologies Bulletin of the ACM Slovakia, 3(1):52--60, 2011

[3] Fox, S., Karnawat, K., Mydland, M., Dumais, S. & White, T.: Evaluating implicit measures to improve web search. In: ACM Transactions on Information Systems (TOIS), ACM, 2005, p. 147–168.

[4] Ricci, F., Rokach, L., Shapira, B., Kantor, P.: Recommender Systems Handbook, 1st edition. Springer-Verlag New York, Inc., October 2010, p. 10 - 23.