MA03 Proactive Information Retrieval by Adaptive Models of Users' Attention and Interests

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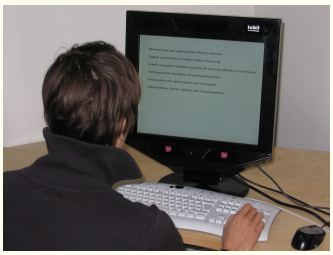
Abstract

Our goal is to develop machine learning methods for predicting user's interests primarily from implicit feedback. In a prototype application the preferences are learned implicitly from eye movements. Collaborative filtering is applied to generalize both over users and over documents. Multimodal user information is then combined with a probabilistic model. The ultimate goal is to develop a genuine autonomous assistant.

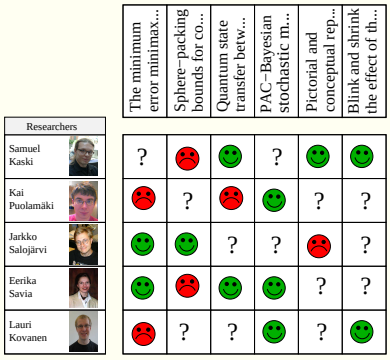
1A Implicit Feedback from Eye Movements

- Users were asked to read lists of titles.
- Eye movements of the users were recorded with an eye tracker.
- In the experimental setup the true relevances were given by the users.



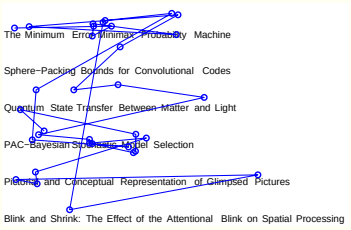
1B Gathering Explicit Relevance Information

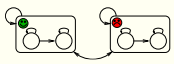
- Users were asked to assess the relevance of titles.
- Task: Predict the missing relevance values.



2A Relevance Prediction from Eye Movements

- Task: Predict the relevance of new titles from the eye movement data.
- A discriminative hidden Markov model was applied for prediction.



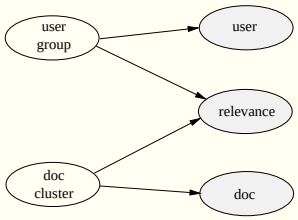


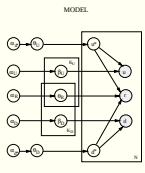
Subtask: What are the best features and models for predicting relevance?

- We organized a PASCAL NoE challenge on the subject during 2005.

2B Collaborative Filtering for Relevance Prediction

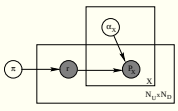
- Probabilistic model that generates (user,document,relevance) triplets.
- Generalizes both over users and documents.
- Predicts users' subjective relevances for documents.

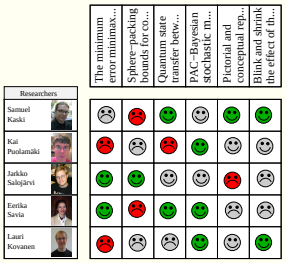




3 Combining Predictions from Different Sources

- Finally, the different sources of relevance information were combined.
- A new discriminative method for combining probabilistic predictions.
- Modular approach: Other sources of information can be plugged in later.





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