

# Adaptive Domain Modelling for Information Retrieval

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## Abstract

Modern search engines employ a number of interactive features to assist users in exploring the document collection and expressing their information needs. Providing these features require knowledge about the document collection in the domain, i.e. a domain model. These models may be difficult to obtain and even if they are available, they may become out of date when the document collection changes or the users start to view the domain differently. In this thesis we propose to use implicit feedback left by users while they interact with search engines to build domain models that evolve over time. These models can adapt to changes in the domain as reflected in the search trend of the user population.

We validate these models in two different IR tasks. The major application is *query recommendation* where previous studies focused on Web search in general or did not consider the temporal aspect of recommendations. Our models address these issues as they are targeted to specific domains such as enterprise search or digital libraries. We furthermore devise an automatic evaluation methodology that allows us to perform extensive evaluation of our adaptive models and observe their performance over time. Using query logs collected from two academic institutions, the evaluation framework assesses the impact of different factors on their performance.

The second application of these models is *query session retrieval*. The query session retrieval problem extends the traditional ad-hoc retrieval by taking into account the previous user interactions with the retrieval system within the same session when answering the query. In this context rather than explicitly providing the user with relevant queries to their information needs, our adaptive models implicitly derive query expansions relevant to the user information needs as identified in the sessions by mapping the session to similar sessions inferred from the models.