



Query Auto Completion in Information Retrieval

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Summary

Query auto completion is an important feature embedded into today's search engines. It can help users formulate queries which other people have searched for when he/she finishes typing the query prefix. Today's most sophisticated query auto completion approaches are based on the collected query logs to provide the best possible queries for each searcher's input.

In this thesis, we develop new query auto completion methods for information retrieval. First, we consider the information of both time and user to propose a time-sensitive personalized query auto completion approach. In previous work, these two sources of information have been developed separately. We bring them together and pay special attention to long-tail prefixes. Second, based on a learning-to-rank framework, we propose to extract features originating from so-called homologous queries and from the semantic similarity of terms, which allow the contributions from similar queries and from semantic relatedness to be used for query auto completion.

In addition, we study the problem of query auto completion diversification, where we aim to diversify aspect-level query intents of query completions. This task has not been studied before. Given that only a limited number of query completions can be returned to users of a search engine, it is important to remove redundant queries and improve user satisfaction by finding an acceptable query. Finally, we conduct an investigation on when to personalize query auto completion by proposing a selectively personalizing query auto completion approach, where the weight of personalization in a query auto completion model is selectively assigned based on the search context in session.

The experimental results in this thesis indicate that our proposed query auto completion approaches can improve the ranking performance of query completions in terms of well-known metrics, like Mean Reciprocal Rank. The unique insights and interesting findings in this thesis may be used to help search engine designers to improve the satisfaction of search engine user by providing high quality query completions.