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*Leveraging User Interaction to Improve Search Experience with
Difficult and Exploratory Queries*

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Abstract: While modern search engines perform well on easy navigational queries, every search engine user knows that there exist queries for which few or none of the top-ranked results are relevant. Such queries are commonly referred to as difficult. There are several major reasons for poor search results. In some cases, users do not have a clear information need and would simply like to explore a particular topic. In other cases, users may have a clear and specific information need, but either cannot accurately formulate it as a keyword query (the query is too short) or their formulation is ambiguous. Such queries are known as exploratory. Although many users are aware that the quality of search results can be improved by reformulating queries, finding a good reformulation is often non-trivial and takes time. Depending on a particular reason for poor initial retrieval results, search systems can try to engage the users into the feedback loop by generating the candidate query reformulations. In this talk, I provide an overview of three interactive feedback methods that I developed as part of my PhD thesis in order to address the specific challenges presented by difficult and exploratory queries: question feedback, sense feedback and concept feedback. Question feedback is aimed at interactive refinement of short, exploratory keyword-based queries by automatically generating and presenting to the users a list of natural language clarification questions. Sense feedback enables the users to interactively improve the quality of retrieval results by selecting the intended sense from a list of automatically generated collection-specific senses of an ambiguous query term. Concept feedback leverages the possibility of multi-step inference on the semantic network of ConceptNet to select and present to the users a small number of concepts, which are related to the original query and can be used for its expansion.

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