Hierachial Recommendation for Academic Search

XINGE WEN, University of Virginia
MINGHUA JIANG, University of Virginia
ZHENG WANG, University of Virginia


1 INTRODUCTION
Nowadays, search engine is used every day for various kinds of information need. Among them one of the scenarios is when people use search engine as a question and answering system to ask a series of questions related to one specific knowledge domain. However, when people are new to the query domain, they may not be able to fully understand the answers for the questions. The missing part is the high level knowledge picture, and in this case, search engine users need to figure out more queries by themselves to satisfy their information need.

In this project, we would like to research and find out an efficient way to recommend the "big picture" to users based on their query, and we plan to adjust the recommendation in terms of user profile.
So the major tasks of this project will include three parts:
1. Design the query interface.
2. Build domain-knowledge recommendation graph.
3. Personalized recommendation based on user profile.

2 RELATED WORK
One of the major challenges of our project may be how to get the satisfied recommendation based on user query. Our initial proposed ideas to address this problem include search result clustering, ODP, or leveraging the data from Google knowledge graph.

Carrot2[1] is an open source search result clustering project which will be a good candidate for us to start our project for query interface and result clustering, however it is flatten instead of hierarchical.

As to where we can get the relationship of entities within our knowledge graph, we believe Wikipedia may be a good source to start with.
We will also look into how Google built their knowledge graph and some other knowledge base and one related research for this is dong et al.[3].
And we may also take advantage of DBpedia[2] (from "DB" for "database") which is a project aiming to extract structured content from the information created in the Wikipedia project. DBpedia allows users to semantically query relationships and properties of Wikipedia resources, including links to other related datasets.

There are also some other researches related to personalized search which includes Trong et al.[4] and Mulay Varun et al. [5].

3 PROPOSED COMPONENTS AND QUERY INTERFACE

Figure 1 shows our proposed components for our project. We will first run classification based on user query and returned result. Then in terms of user profile, we will generated the knowledge graph according to user’s query history and interest. Figure 2 shows our proposed query interface.

4 BENEFITS OF THE PROJECT

Our project aims to reduce the search effort when people are searching for academic questions. Chances are that for these kind of queries, the real information need is to master one specific domain knowledge. We believe to recommend the necessary information related to the domain knowledge based on user’s questions is more helpful than just giving answers to their queries.

5 MILESTONE

The implementation of our project contains three major milestones:

5.1 Minimal success

Finish building the query interface and knowledge graph recommendation.
5.2 Medium success
Finish building user ontology, implement personalized recommendation.

5.3 A good success
Create metrics and design test to verify the effect of these recommendations.

REFERENCES