Personalization of Keyword-based Search on Structured Data Sources

Dragan Ivanovic and Georgia M. Kapitsaki

University of Novi Sad, Serbia
University of Cyprus, Cyprus
dragan.ivanovic@uns.ac.rs,
gkapi@cs.ucy.ac.cy

Abstract. Information Retrieval systems are developed in order to meet users' need. The relevance of search results is one of the main measures of success of those systems. Besides a query keywords, personal information about a user should be used in the process of performing query and calculation of relevance of a certain result. Personalization of search and its results is important for all Information retrieval systems. The main topic of this paper is definition of challenges specific for user profiling for keyword-based search on structured data sources.

Keywords: user profiling, ambiquity of queries, context profiles, personalization

1 Introduction

Information Retrieval (IR) systems and search engines such as Yahoo and Google, are developed to meet users' needs. In order to meet users' need those systems should use as much as possible available information. Besides information contained in a query keywords, the systems could use geographic location of users' devices used for making queries, history of users' search, personal information about users, etc., leading to the use of context information in the query [1].

In order to utilize this information to the fullest, information retrieval systems could create users profiles which should be adaptive considering the change of the users' preferences over time and domain, embracing thus context-aware information retrieval. By using those users profiles, IR systems can provide more personalized search results to users and resolve some ambiguity of queries [3] and at the same time bring results closer to the real needs of the user.

2 Research Challenges, Approaches and Scientific fields

Besides shared challenges in this field for all information retrieval systems including keyword-based search on unstructured data, there are a few specific challenges in the field of user profiling for keyword-based search on structured data source:

1. Can user profile data be used to help in transformation of keyword based query to a structured query?
2. Can user profile data be used to personalize the list of results in the sense of adapting part of the structured data that will form part of the query result?
3. Can user profiles be used to personalize user interfaces during search in order to produce better interactivity between the user and the system?

Personalization of Keyword-based Search on Structured Data Sources is an interdisciplinary open issue. It includes methods and techniques used in the following scientific fields: Personal information management, User profiling, Information retrieval, Human-computer interaction, Knowledge management, Context-aware applications, Log mining, etc. Some concepts can be found in previous works, such as the use of user preferences in database searches [4], but the above issues are open to explore, since this area is lacking mature research results.

3 Case studies

The research information system of University of Novi Sad (CRIS UNS) has been under development since 2009. By 2015, there are more than 15000 scientific research outputs described using structured metadata in the CRIS UNS database. There is a form for searching those data and there are a few thousands queries executed each month. These are logged using a textual file. A lot of queries are made by researchers employed at the University of Novi Sad which are registered as users of the CRIS UNS system leading to the storing of information relevant to the user: user biography, position, affiliation, scientific research results, list of their collaborators, etc. Those data can be utilized as a case study for the aforementioned challenges. Similar concepts can be exploited via the academic suite Docear [2].

References

1. Abowd, G. D., Dey, A. K., Brown, P. J., Davies, N., Smith, M., and Steggles, P.: Towards a better understanding of context and context-awareness. In Handheld and ubiquitous computing, pp. 304-307, Springer Berlin Heidelber (1999, January).
2. Beel, J., Langer, S., Genzmehr, M., and Gipp, B.: Utilizing Mind-Maps for Information Retrieval and User Modelling. In User Modeling, Adaptation, and Personalization, pp. 301-313, Springer International (2014).
3. Jeon, H., Kim, T., Choi, J.: Adaptive user profiling for personalized information retrieval. In Convergence and Hybrid Information Technology, 2008. ICCIT'08. Third International Conference, vol. 2, pp. 836-841 (2008, November).
4. Stefanidis, K., Drosou, M., and Pitoura, E.: PerK: personalized keyword search in relational databases through preferences. In Proceedings of the 13th International Conference on Extending Database Technology, pp. 585-596. ACM (2010, March).