

Algorithm for Information Retrieval optimization

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Abstract

When using Information Retrieval (IR) systems, users often present search queries made of ad-hoc keywords. It is then up to the information retrieval systems (IRS) to obtain a precise representation of the user's information need and the context (preferences) of the information. To address this problem, we investigate optimization of IRS to individual information needs in order of relevance. The goal of this article is to develop algorithms that optimize the ranking of documents retrieved from IRS according to user search context. In particular, the ranking task that led the user to engage in information-seeking behaviour during search tasks. This article discusses and describes a Document Ranking Optimization (DROPT) algorithm for IR in an Internet-based or designated databases environment. Conversely, as the volume of information available online and in designated databases is growing continuously, ranking algorithms can play a major role in the context of search results. In this article, a DROPT technique for documents retrieved from a corpus is developed with respect to document index keywords and the query vectors. This is based on calculating the weight (w_{ij}) of keywords in the document index vector, calculated as a function of the frequency of a keyword k_j across a document. The purpose of the DROPT technique is to reflect how human users can judge the context changes in IR result rankings according to information relevance. This article shows that it is possible for the DROPT technique to overcome some of the limitations of existing traditional ($tf \times idf$) algorithms via adaptation. The empirical evaluation using metrics measures on the DROPT technique carried out through human user interaction shows improvement over the traditional relevance feedback technique to demonstrate improving IR effectiveness.

Keywords: Context, Internet, Algorithm design and analysis, Indexes, Optimization, Search engines

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