

Request-Prediction and Hyperlink-Proposals Methodologies and Mathematics behind Web-Applications

Dissertation

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Abstract

Due to the breath-taking growth of the World Wide Web (WWW), the need for fast and efficient web applications becomes more and more urgent. In this doctoral thesis, the emphasis will be on two concrete tasks for improving Internet applications.

On the one hand, a major problem of many of today's Internet applications may be described as the performance of the Client/Server-communication: servers often take a long time to respond to a client's request. There are several strategies to overcome this problem of high user-perceived latencies; one of them is to predict future user-requests. This way, time-consuming calculations on the server's side can be performed even before the corresponding request is being made. Furthermore, in certain situations, also the pre-fetching or the pre-sending of data might be appropriate. Those ideas will be discussed in detail in the second part of this work.

On the other hand, a focus will be placed on the problem of proposing hyperlinks to improve the quality of rapid written texts, at first glance, an entirely different problem to predicting client requests. Ultra-modern online authoring systems that provide possibilities to check link-consistencies and administrate link management should also propose links in order to improve the usefulness of the produced HTML-documents. In the third part of this elaboration, we will describe a possibility to build a hyperlink-proposal module based on statistical information retrieval from hypertexts.

These two problem categories do not seem to have much in common. It is one aim of this work to show that there are certain, similar solution strategies to look after both problems. A closer comparison and an abstraction of both methodologies will lead to interesting synergetic effects. For example, advanced strategies to foresee future user-requests by modeling time and document aging can be used to improve the quality of hyperlink-proposals too.