Energy Based Web Page Ranking

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ABSTRACT

In this paper, the authors are going to establish a relationship between Web page ranking and Web page energy consumption. It is considered in this research work that Web page ranking depends on the information stored in that Web page. It is also presumed that energy consumption in a Web page is related with the stored information. Hence, Web page ranking is closely related with the stored information in the Web page. Connection between Web page ranking and energy consumption is constructed within this paper introducing two theorems based on the Web activities. Web page Energy is directly proportional to the Information Storage within the Web page. Ranking of a Web page for a given period of time is directly proportional to the Information Storage within the Web page.

Keywords: Web Links, Web Page Energy, Web Page Ranking, Web Page Storage

1. INTRODUCTION

1.1. Overview

Web population has been increased exponentially due to the wide range of Web services and Web literacy. It is observed that collecting required information through Web is becoming more convenient. Efficient management and compilation of stored information is highly desirable from server’s perspective. Searching, sorting, and availability of required information based on users’ demand are preferable from users’ perspective. Ranking of demanded Web pages depends on various criteria. Web page information and relevancy of Web page with respect to the users’ query are important for evaluating specific Web pages.

1.2. Related Works

Energy consumption in different sector is shown in Figure 1.

Probability based Web page ranking is implemented by comprehensive set of experiments and examining some straightforward methods (Provost and Domingoes, 2003). An innovative unsupervised method for automatic sentence extraction using graph-based ranking algorithms is introduced in (Mihalcea, 2004). Graph-based ranking method is proposed in (Dom et al., 2003) to rank email correspondents according to their degree of expertise on subjects of interest. A prototype application to demonstrate ranking model adoption using a novel ranking model meant for ranking the search results besides adapting to new domains is proposed in (Greeshma et al., 2013). Important Inbound and outbound Web links are analysed to rank Web page. Session and relevancy are the parameters used to calculate final Web page rank (Guha et al., 2013). Session is checked for avoiding unwanted noise as it is considered as an important rank calculation factor (Guha et al., 2012).

It is evident that energy consumption in any form is obvious in each sector of science and technology. The energy consumption of computers and monitors is determined by the amount of...
energy they require to operate and how they are used. Energy consumption in different sectors in the world is shown in Figure 1.

Energy consumption in different geographical locations is shown in Figure 2. Energy consumption in Web arena is quite evident.

Queueing theory and stochastic water storage theory concept have been implemented to avoid many obstacles in page ranking measurements (Zin et al., 2015). A different approach in ranking of scientific papers is proposed in Krapivin and Marchese (2008). Focused surfer model is implemented to rank the papers (Krapivin and Marchese, 2008). A distribution computation based on a matrix equation is presented in Sankaralingam et al. (2003). Ranking in social network is proposed in Freire and Figueiredo (2011). Individuals within the group are ranked by using a group based metric (Freire and Figueiredo, 2011).

A new ranking approach is proposed in Thukral et al. (2011) based on the popularity and relevance of a Web page. Web page ranking is validated by using cellular automata as dynamic mathematical model in Mitra and Kundu (2015). Page rank with different weight factors and user access period is used to rank Web pages in Sumanthi et al. (2015).

Domain based ranking method is proposed in Guha et al. (2015). Web pages are clustered as primary and secondary domains (Guha et al., 2015). A data structural model is introduced in Mukhopadhyay et al. (2010) for matched Web pages. Comparison of different link structure based ranking algorithms is discussed in Kumar et al. (2016). A dynamic page rank algorithm is proposed in Jain et al. (2013). Word sense disambiguation approach is used to rank the web pages (Jain et al., 2013).

1.3. Aim

It is observed that a certain amount of energy is consumed when a Web page is accessed. Web pages contain certain information regarding different topics. Our aim is to establish a relation between energy consumption of the Web page and rank of the Web page.

1.4. Scope

Energy consumption of a Web page is considered as the information stored within the Web page. Web page rank is closely related with the relevance of the Web page with respect to the user’s query.
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