MapReduce Data Processing to Data-Mine the Blogosphere

Project Ideas

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ABSTRACT

This article is to present project ideas for Fall 2011 Data-Intensive Computing for Text Analysis class. Using MapReduce-based text processing for keyword extraction, possible applications are discussed. First, using implicit links, sparse links between blog articles that hampers applying information retrieval techniques can be overcome. Second, with Latent Dirichlet Allocation, we may generate a topic model based on extracted keywords. Finally, with the extracted keywords, we can visualize blogs and keywords that may help perceive how the blogosphere looks like in the big picture.

Categories and Subject Descriptors

H.4.m [**Information Systems Applications**]: Miscellaneous; H.5.4 [**Information Interfaces and Presentation**]: Hypertext/Hypermedia

General Terms

MapReduce, Blogosphere

Keywords

Keyword Extraction, Data-intensive Processing, Implicit links in Blogosphere

1. INTRODUCTION

Blog is a very important and interesting source of diverse information. People search blogs to find out how to cook, what to do, what to see, and to discover what others think. Since blogs are usually written in plain language by individuals enthusiastic for their interest, blogs may be a lot more understandable than news articles and cover a very wide personal range of topics. However, unlike web information retrieval, blog information retrieval is still very limited and faces many challenges. Some well-established Web information retrieval techniques do not perform well on blogs because of sparse links, multimedia contents and the short length of the contents [1]. In particular, PageRank [3], which made a revolutionary improvement by taking into account the link structure of HTML Web documents, does not perform well for blog posts as they lack strong link structure. Another problem for blog information retrieval is the length of the blog posts. They vary from one line to several pages and require smoothing or normalization to achieve effective information retrieval. In this study, a novel method for augmenting implicit citation links to the explicit HTML links and document expansion for blog posts will be introduced. Extraction of implicit citation links from blog posts will address the sparse link problem that hampers utilizing PageRank and other link-based retrieval algorithms for blog information retrieval. The methodology of extracting implicit citation will utilize Blog content extraction using Decruft[1] and noun chunk extraction based on Python NLTK[2]. By augmenting documents implicit links, the proposed method tries to improve blog information retrieval. I will also explore possible other applications to improve information presentation for the Blogosphere.

Data-Intensive Computing for Text Analysis Fall 2011, School of Information, University of Texas at Austin

2. PROJECT IDEAS

2.1 Blog Information Retrieval Performance Improvement Using Implicit Links

The idea of using link structure for information retrieval has been recognized as the key to successful information retrieval ever since the emergence of Google and its core algorithm, PageRank [3]. Another trial to make use of links for information retrieval was proposed was HITS [4], and PageRank and HITS are now the minimum standard of the web information retrieval to assure the quality of the retrieved web pages. However, unfortunately, these powerful algorithms cannot be fully exploited for blog information retrieval due to lack of strong link structure in the blogosphere.

With extracted keyphrases using MapReduce and NLTK, we will provide more prior information for a MapReduce-based search engine Ivory[3], to improve blog search performance.

[1]http://www.minvolai.com/blog/decruft-arc90s-readability-in-python/
[2]Natural Language Toolkit, http://www.nltk.org/
[3]http://www.umiacs.umd.edu/ jimmylin/ivory/docs/index.html

2.2 Topic Analysis Using Latent Dirichlet Allocation

Latent Dirichlet Allocation (LDA)[2] is a generative probabilistic model that can be utilized to detect topics in a document collection. Using LDA, we can find frequently-discussed topics across the blogosphere and how they change over time. Presenting topic data and clustering the articles can help users easily identify important issues, trace the development of stories, and easily jump around related articles.

2.3 Visualization for Users

There has been many attempts to visualize blogosphere [5, 6], however they could hardly help users for better navigation. Using the visualization techniques integrated into the navigation system, we would be able to benefit actual users to find the blog articles better and to navigate between related articles easily.

3. ACKNOWLEDGMENTS

Jae Hyeon Bae will join with me for the final project.

4. REFERENCES

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