Survey on Deep Web Interfaces using Data Mining Technolog

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ABSTRACT

The Deep Web, i.e., content hidden behind HTML forms, has long been acknowledged as a significant gap in search engine coverage. It represents a large portion of the structured data on the Web; accessing Deep-Web content has been a long-standing challenge for the database community. Deep web crawling is fundamental problem faced by web crawlers that has profound effect on search engine efficiency. Recent study shows that nearly 96% of data over internet is hidden i.e. not found to search engines. The challenge imposed on search engines is to retrieve hidden web data at low cost. This system uses a machine learning approach that is completely automatic, highly scalable, and very efficient, that helps to improve data retrieval at reduced cost. This system uses focused crawling strategy for retrieving accurate results related to query and selects only relevant links according to their similarity with respect to query. The algorithm used in this system efficiently selects only possible candidates rather than searching whole search space for inclusion in too ur web search index.

Keyword : - *Key Deep Web, Two-Stage Crawler, Feature Selection, Ranking, Adaptive Learning*

1. Introduction

Current-day web search engines (e.g., Google) do not crawl and index a significant portion of the Web and, hence, web users relying on search engines only are unable to discover and access a large amount of information from the non- indexable part of the Web. Specifically, dynamic pages generated based on parameters provided by a user via web search forms (or search interfaces)are not indexed by search engines and cannot be found in searchers results. Current web search engines include in their indices only a portion of the Web. There are a number of reasons for this, including inevitable ones, but the most important point here is that the significant part of the Web is unknown to search engines. Such search interfaces provide web users with an online access to myriads of databases on the Web. In order to obtain some information from a web database of interest, a user issues his/her query by specifying query terms in a search form and receives the query results, a set of dynamic pages that embed required information from a database. At the same time , issuing a query via an arbitrary search interface is an extremely complex task for any kind of automatic agents including web crawlers, which, at least up to the present day, do not even attempt to pass through web forms on a large scale. Our primary and key object of study is a huge portion of the Web (hereafter referred as the deep Web) hidden behind web search interfaces. We concentrate on three classes of problems around the deep Web: characterization of deep Web, finding and classifying deep web resources, and querying web databases.

The deep Web has been growing at a very fast pace. It has been estimated that there are hundred thousands of deep web sites. Due to the huge volume of information in

the deep Web, there has been a significant interest to approaches that allow users and computer applications to leverage this information. Most approaches assumed that search interfaces to web databases of interest are already discovered and known to query systems. However, such assumptions do not hold true mostly because of the large scale of the deep Web – indeed, for any given domain of interest there are too many web databases with relevant content.

Web forms are formidable barriers for any kind of automatic agents, e.g., web crawlers, which unlike human beings, have great difficulties in filling out forms and retrieving information from returned pages. Hereafter we refer to all web pages behind search interfaces as the deep Web. The deep Web is not the only part of the Web, which is badly indexed by search engines.

2. REVIEW OF MINING IN DISTRIBUTED ENVIRONMENT

Search engine web sites are the most visited in the internet worldwide due to their significance in our daily life. Web crawler is the leading function or module in the entire World Wide Web (WWW) as it is the spirit of any search engine. Standard crawler is a commanding technique for traversing the web, but it is loud in terms of resource usage on both client and server. Thus, most of the researchers focus on the structural design of the algorithms that are able to collect the most relevant pages with the matching topic of interest. The term focused crawling was originally introduced by (Chakrabarti, Berg, & Dom, 1999) which indicates the crawl of topic-specific web pages. In order to put aside hardware and network resources, a focused web crawler analyses the crawled pages to discover links that are likely to be most relevant for the crawl and pay no attention to the irrelevant clusters of the web.

In [9] Chakrabarti, Berg and Dom (1999) descried a focused web crawler with three mechanism, a classifier to evaluate the web page significance to the chosen topic, a distiller to recognize the relevant nodes using few link layers, and a reconfigurable crawler that is govern by the classifier and distiller. They try to compel various features on the designed classifier and distiller: travel around links in terms of their sociology, extract specified web pages base on the given query, and explore removal communities (training) to improve the crawling ability with high excellence and less relevant web pages.

In [8] Web page credtis difficulty was addressed by (Diligenti, Coetzee, Lawrence, Giles and Gori, 2000), in which the crawl paths selected based on the number of pages and their values. They use context graph to imprison the link hierarchies within which valuable pages happen and provide reverse crawling capabilities for more comprehensive search. They also concluded that focused crawling is the future and replacement of standard crawling as long as large machine resources are available.

In [7] Suel and Shkapenyuk (2002) described the architecture and implementation of optimized dispersed web crawler which runs on numerous work stations. Their crawler is crash resistant and capable of scaling up to hundreds of pages per second by growing the number of participating nodes.

In [6] CROSSMARC approach was introduced by (Karkaletsis, Stamatakis, Horlock, Grover and Curran, 2003). CROSSMARC employs language techniques and machine learning for multi-lingual in sequence extraction and consists of three main mechanism: site navigator to traverse web pages and forward the composed information to (Page filtering) and (Link scoring). Page filtering is to filter the in sequence based on the given queries and link scoring sets the threshold likelihood of the crawled links.

In [5] Baeza-Yates (2005) highlighted that crawlers in the search engine are in charge for generating the structured data and they are bright to optimize the retrieving process using focused web crawler for improved search results. Castillo (2005) designed a new model for web crawler, which was incorporated with the search engine project (WIRE) and provided an right of entry to metadata that enables the web crawling process. He emphasize on how to capture the most relevant pages as there are never- ending number of web pages in the internet with weak association and relationship. He also stated that traverse only five layers from the home page is enough to get overview photograph of the corresponding web site, hence it save more bandwidth and avoid network congestion.

In [4] Rungsawang and Angkawattanawit (2005) attempt to enhance the crawling process by Connecting knowledge bases to build the knowledge of learnable focused web crawlers. They show results of an optimized focused web crawler that study from the information collected by the knowledge base within one domain or group. They have proposed three kinds of information bases to help

in collecting as many relevant web pages and recognize the keywords related to the topic of interest.

In [3] Liu, Milios and Korba (2008) presented a framework for focused web crawler based on Maximum Entropy Markov Models (MEMMs) that improved the working mechanism of the crawler to become in the middle of the best Best-First on web data mining based on two metrics, precision and maximum standard similarity. Using MEMMs, they were able to exploit multiple overlapping and correlated features, including anchor text and the keywords fixed in the URL. Through experiments, using MEMMs and combination of all features in the focused web crawler performs better than using Viterbi algorithm and dependent only on restricted number of features.

In [2] Batsakis, Petrakis and Milios (2009) evaluated various existing approaches to web crawling such as Breadth-First, Best-First and Hidden Markov Model (HMM) crawlers. They planned focused web crawler based on HMM for learning, most important to relevant pages paths. They combined classic focused web crawler attributes with the ideas from text clustering to result in optimized relevant path analysis. Liu and Milios (2010) developed their previous framework (Liu, Milios and Korba, Exploiting Multiple Features with MEMMs for Focused Web Crawling 2008), in which they proposed two probabilistic models to construct a focused crawler, MEMMs and Linear-chain Conditional Random Field (CRF) as shown in Figure 2. Their experiments demonstrate improvement on the focused crawling and gave benefit over context graph (Diligenti, et al. 2000) and their previous model.

4. CONCLUSIONS

Web crawling is an initial component in search engines and estimation mining frameworks. We have compared between standard web crawlers and focused web crawlers to understand which one is better and apply it in our estimation mining framework in a proposed wok.

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