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Smart Crawler Using Deep-Web Interfaces

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ABSTRACT: This is a survey of web crawling. While at first glance web crawling may appear to be merely an application of breadth-first-search, the truth is that there are many challenges ranging from systems concerns such as managing very large data structures to theoretical questions such ashow often to revisit evolving content sources. However, due to the large volume of web resources and the dynamic nature of deep web, achieving large coverage and high efficiency is a challenging issue. We propose a two stage framework, namely Smart-Crawler, for efficient harvesting wide web interfaces. In the first stage, it is site based searching for center pages with the help of search engines, it avoid visiting large number of pages. To achieve more accurate results for a focused crawl, it is ranking the websites to prioritize highly relevant ones for a given topic. In the second step, It searches fast insite searching by extracting most relevant link s with an adaptive link-ranking. To eliminate bias on visiting some it also contain highly relevant link s in hidden web directories, we design a link tree data structure to achieve wider coverage for a website.

KEYWORDS: Deep web, two-stage crawler, feature selection, ranking, adaptive learning.

I. INTRODUCTION

All over the world the internet is avast collection of billions of web pages containing large bytes of information or data arranged in N number of servers. It is really challenging to locate the deep web databases, because they are not recorded with any search engines, are generally sparsely distributed, and keep continually changing. To label this problem, previous work has presented two types of crawlers, genericcrawlers and the focused crawlers. Generic crawlers which fetch allsearchable forms and cannot focus on a particular topic. Focused crawlers like FormFocused Crawler (FFC) and Adaptive Crawler for hidden web Entries (ACHE) can automatically look online databases on aindividual topic. FormFocused is designed with linkpage, and build classifiers for focused crawling of web forms, and is expanded by ACHE with more components for form filtering and adaptive link learner. The link classifiers in these crawlers play a pivotal role in achieving higher crawling efficiency than the best-first crawler. However, these link classifiers are used to predict the distance to the page containing searchable forms, which is difficult to estimate, especially for the delayed benefit links (links eventually lead to pages with forms). As aresult, the crawler can be inefficiently led to pages without targeted forms.Thedeep(or hidden) web refers to the contents lie behind searchable web interfaces that cannot be indexedby searching engines. Based on extrapolations from astudy done at University of California, Berkeley, it isestimated that the deep web contains approximately91,850 terabytes and the surface web is only about 167terabytes in 2003 [1]. More recent studies estimatedthat 1.9 zettabytes were reached and 0.3 zettabyteswere consumed worldwide in 2007 [2], [3]. An IDCreport estimates that the total of all digital data created, replicated, and consumed will reach 6zettabytesin 2014 [4]. A significant portion of this huge amountof data is estimated to be stored as structured orrelational data in web databases — deep web makesup about 96% of all the content on the Internet, which, is 500-550 timeslarger than the surface web [5], [6].These data contain a vast amount of valuable information and entities such as Infomine [7], Clusty [8],BooksInPrint [9] may be interested in building anindex of the deep web sources in a given domain(such as book). Because these entities cannot accessthe proprietary web indices of search engines (e.g.,Google and Baidu), there is a need for an efficient.

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II. RELATED WORK

To leverage the large volume information buried in deep web, previous work has proposed a number of techniques and tools, including deep web understanding and integration [10], [24], [25], [26], [27], hidden web crawlers [18], [28], [29], and deep web samplers [30], [31], [32]. For all these approaches, the ability to crawl deep web is a key challenge. Olston and Najork systematically present that crawling deep web has three steps: locating deep web content sources, selecting relevant sources and extracting underlying content [19]. Following their statement, we discuss the two steps closely related to our work as below. Locating deep web content sources. A recent study shows that the harvest rate of deep web is low — only 647,000 distinct web forms were found by sampling 25 million pages from the Google index (about 2.5%) [27],[33]. Generic crawlers are mainly developed for characterizing deep web and directory construction of deep web resources, that do not limit search ona specific topic, but attempt to fetch all searchableforms [10], [11], [12], [13], [14]. The Database Crawlerin the MetaQuerier [10] is designed for automaticallydiscovering query interfaces. Database Crawler firstfinds root pages by an IP-based sampling, and thenperforms shallow crawling to crawl pages within aweb server starting from a given root page. The IP-based sampling ignores the fact that one IP addressmay have several virtual hosts [11], thus missingmany websites. To overcome the drawback of IP-based sampling in the Database Crawler, Denis etal. propose a stratified random sampling of hosts tocharacterize national deep web [13], using the Host-graph provided by the Russian search engine Yandex.I-Crawler [14] combines pre-query and post-queryapproaches for classification of searchable forms.Selecting relevant sources. Existing hidden webdirectories [34], [8], [7] usually have low coveragefor relevant online databases [23], which limits theirability in satisfying data access needs [35]. Focusedcrawler is developed to visit links to pages of interestand avoid links to off-topic regions [17], [36], [15], [16].Soumen et al. describe a best-first focused crawler,which uses a page classifier to guide the search [17].The classifier learns to classify pages as topic-relevantor not and gives priority to links in topic relevantpages. However, a focused best-first crawler harvestsonly 94 movie search forms after crawling 100,000movie related pages [16]. An improvement to thebest-first crawler is proposed in [36], where insteadof following all links in relevant pages, the crawlerused an additional classifier, the apprentice, to selectthe most promising links in a relevant page. Thebaseline classifier gives its choice as feedback so thatthe apprentice can learn the features of good linksand prioritize links in the frontier. The FFC [15] andACHE [16] are focused crawlers used for searchinginterested deep web interfaces. The FFC contains threeclassifiers: a page classifier that scores the relevance ofretrieved pages with a specific topic, a link classifierthat prioritizes the links that may lead to pages withsearchable forms, and a form classifier that filters outnon-searchable forms. ACHE improves FFC with anadaptive link learner and automatic feature selection.SourceRank [20], [21] assesses the relevance of deepweb sources during retrieval. Based on an agreementgraph, SourceRank calculates the stationary visit probability of a random walk to rank results.

III. PROPOSED SYSTEM

Smart Crawler is two stage crawlers that efficiently harvest deep web. Seed web sites are given as input to crawler. At the first stage crawler determines the most relevant data according to the keyword given by the users. At second stage insite exploration is done that divulge searchable forms from the sites. Once the search is made, the relevant URL is stored in the site database. Site locating is done by reverse searching technique, which search for the data second time but this time in reverse manner. This is used to obtain maximumamount of appropriate data. Reverse search is triggered when there are less results than that of threshold specified. To achieve more coverage of web, insite searching is done in the directories. In the insite exploring stage, crawler crawls through the pages and finds the hyperlinks present in the pages and add it to the database yet it limits visits to the large number of the sites. This uses Stop Early mechanism and Balanced Link Tree. Stop Early method stops the crawler from visiting to non appropriate websites. Here, simple breadth first method is used that is not efficient. It results in incomplete directory visits and omits highly relevant links. Links are often unevenly distributed across web, this results in biasing on some directories. This problem is overcome by merging trees or directories. Ranking is done in two phases. First Link Ranker prioritizes links so that the crawler can locate pages that are searchable. The high relevance score is given to those sites which is most similar to that of searchable form

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pages. At the next phase crawling is focused using Form Classifier that filters irrelevant forms and non searchable forms from the database. Site ranking and Link ranking is done using two features that are, Site

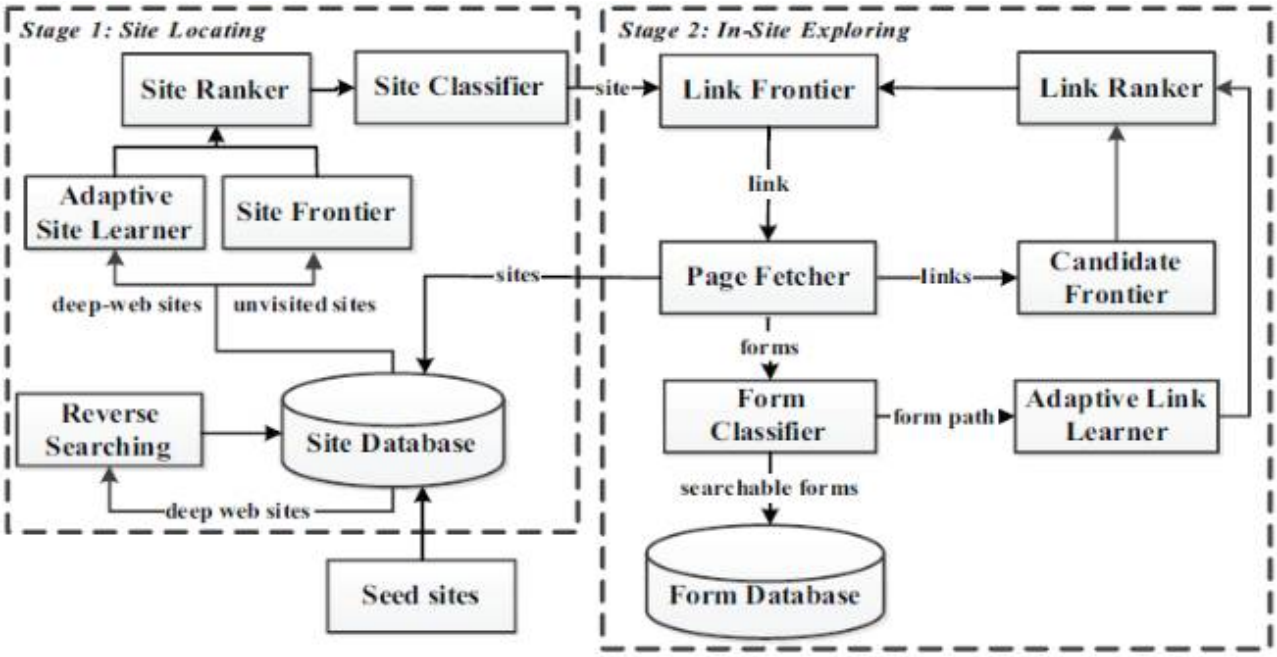

Fig.1 System Architecture

Similarity and Site Frequency. Site similarity measures the similarity of the topic between new sitewhich is encountered by the crawler and deep web sites which are known to crawler. Site frequency is the frequency of the site which appears in other sites that depicts the popularity of the site.The additional features make Crawling yet better includes, Site Crawling, Accessibility Crawling using site map generation and Security Testing using Web Authentication Crawling.Stress crawling is executed to evaluate a system, or component at or beyond the limits of its specified requirements. It is used to evaluate system responses at activity peaks that can exceed systems limitations, and to verify if the system crashes or it is able to recover from such conditions. Stress testing differs from performance and load testing because the system is executed on or beyond its breaking points, while performance and load testing simulate regular user activity. Failures found by stress testing are mainly due to faults in the running environment.Web site map generation is done using accessibility crawling test, that can be considered as a particular type of usability testing whose aim is to verify that access to the content of the application is allowed even in presence of reduced hardware/ software configurations on the client side of the application (such as browser configurations disabling graphical visualization, or scripting execution), or of users with physical disabilities (such as blind people). In the case of Web applications, accessibility rules such as the one provided by the Web Content Accessibility Guidelines have been established, so that accessibility testing will have to verify the compliance to such rules. The application is the main responsible for accessibility, even if some accessibility failures may be due to the configuration of the running environment (e.g. browsers where the execution of scripts is disabled).

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IV. PROPOSED ALGORITHM

1. Reverse searching:

The main aimis to exploit existing search engines, such as Google, to help in finding centre pages of un-searchedsites. This is done because search engines like Googlerank the WebPagesof a site. These pages will tend to have high ranking values. This algorithm discuss about the reverse searching.

This reverse searching is used in:

- When the crawler will be bootstrapped.
- When the size of site frontier decreases to a predefined threshold.

We are randomly picking up a known wide website or a seed site and using general search engine facility to find canter pages and other relevant sites, Such as Google link. For instance, we are taking one example: link: www.google.com

In that web page it will be pointing to the Googlehome page. And Also In this system, the final page from the search engine is first parsed and go to the extract the links. Then that page will be downloaded and doinganalyztation todecide whether the links are relatedit is related.

- If the no. of seed sites or fetched to the wide web sites in the page is greater than a user defined threshold. Finally, we will getting the output. In this way, we keepSite Frontier with enough site.

2. Incremental site prioritizing:

To resume the crawling process and achieving large coverage on websites, for that the incremental siteprioritizing strategy is proposed. This concept is to record the learned patterns from deep web sites andforming paths forincremental crawling. Firstly we will discuss on the prior knowledge is used for initializeSite Ranker and Link Ranker. Then, unsearched sites are denoting to the Site Frontier and are prioritized by the Site Ranker,and searched sites are added to combine the site list. And the detailed incremental site prioritizing process is described in **Algorithm 2.**When smart crawler follows the out of site links of related sites. To currentlyclassify the out of sitelinks, The Site Frontier utilizes two queues to save unsearched sites. The large priority queue is for out of site links that are classified by the relevant Site Classifier and they will be judged by Form Classifier to contain searchableforms. The lowest priority queue is for out of site links that will be only judged by a relevant Site Classifier. The lowest priorityqueue is using to supply more candidate sites.

Advantages:

1) We can get related website or link of the information.
2) User gets an ranked list of websites
3) Ranking of websites is done.
4) It keeps all sites in balance condition
5) Ranking of websites is done through most visited by the users

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VI. EXPERIMENTAL RESULTS

Fig. 2 Search domain name.

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First search valid domain name. If valid domain enter domain related web sites display.

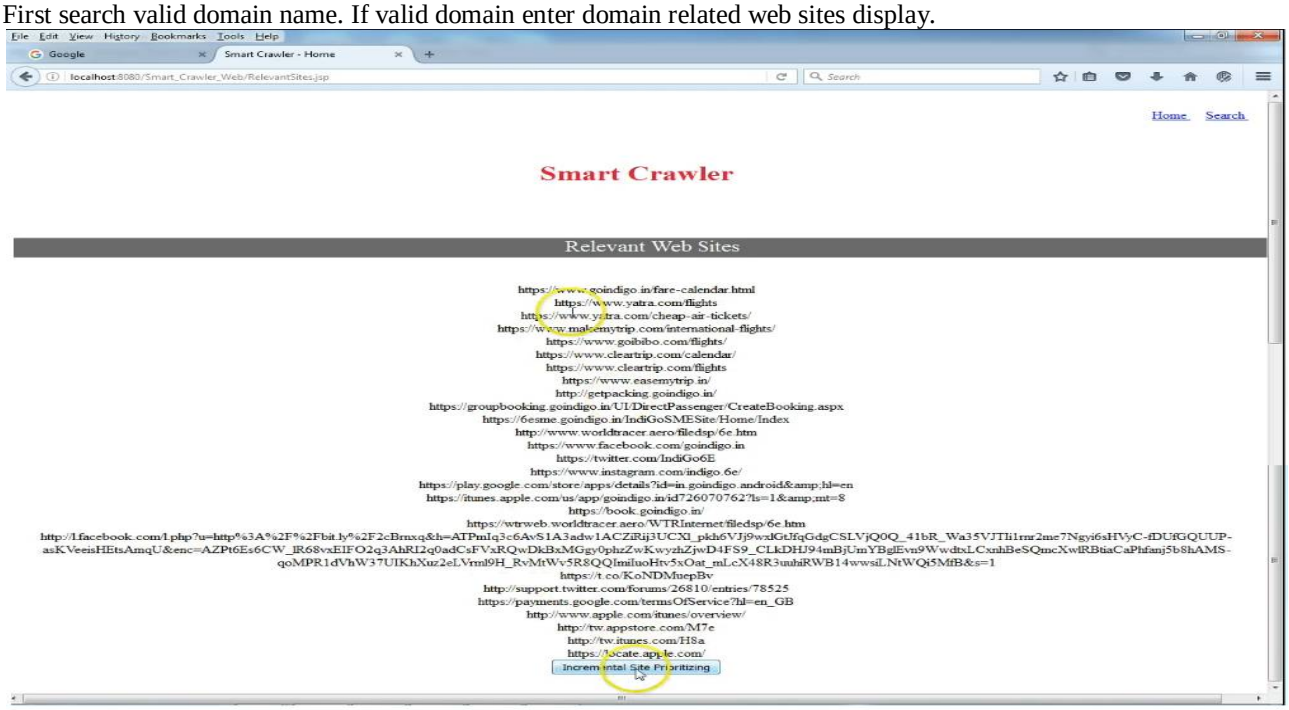

Fig. 3. Related web sites display

Show the domain related web sites.

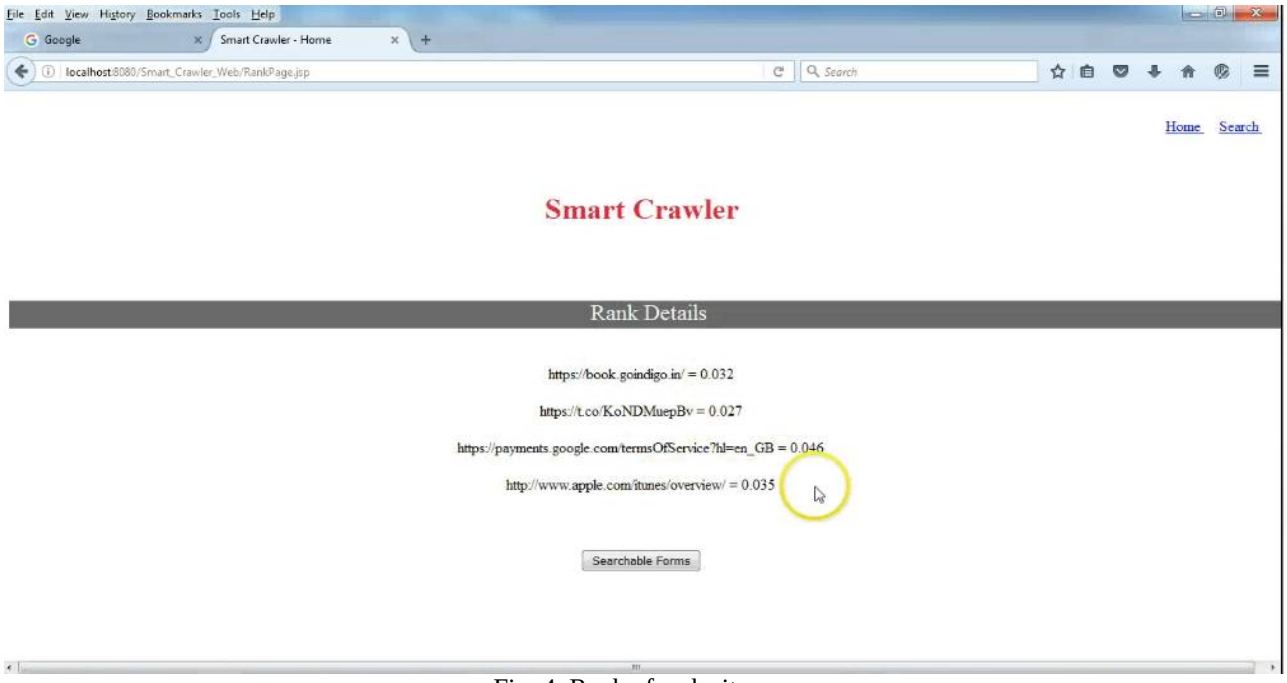

Fig. 4. Rank of web sites

Show the ranking of web site, which one of the popular web site.

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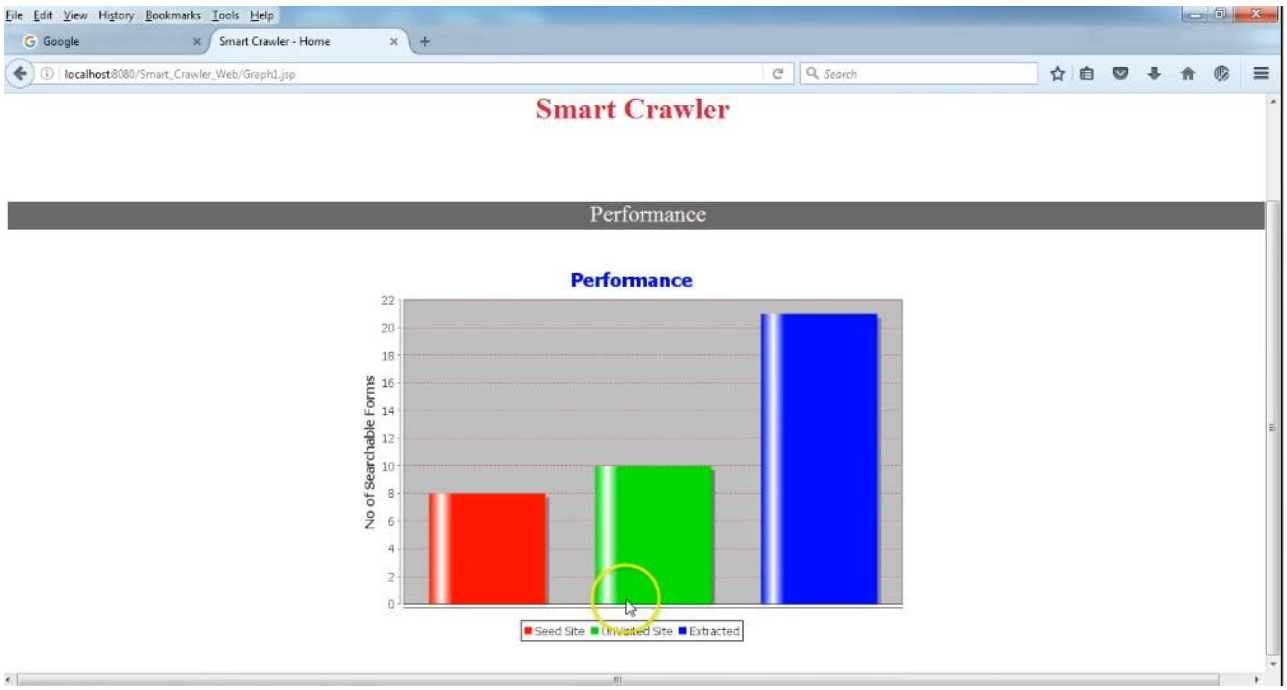

Fig. 5 Performance graph

Show the performance of the web site. Which most popular web site?

VII. CONCLUSION

From our In this paper, we have a tendency to propose a good gather framework for deepweb interfaces, specifically Smart-Crawler. We've shown that our approach achieves each wide coverage for deep net interfaces and maintains extremely economical locomotion. SmartCrawler may be a cantered crawler consisting of 2 stages: economical website locating and balanced in-site exploring. SmartCrawler performs site-based locatingby reversely looking out the well-known deep websites for centre pages, which may effectively notice several information sources for distributed domains. By ranking collected sites and by focusing the locomotion on a subject, SmartCrawler achieves a lot of correct results. The in-site exploring stage uses adaptation link-ranking to go looking among a site; and that we style a link tree for eliminating bias toward sure directories of a web site for wider coverage of web directories. Our experimental results on a representative set of domains show the effectiveness of the projected two-stage crawler, that achieves higher harvest rates than alternative crawlers. In future work, we have a tendency to conceive to mix pre-query and post-query approaches for classifying deep-web forms to additional improve the accuracy of the shape classifier.

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