



## FUZZY SEARCH ENGINE BASED ON FUZZY ONTOLOGY

P. B.NIRANJANE<sup>1</sup>, SUSHMA D. CHAVHAN<sup>2</sup>

<sup>1</sup>Assistant Professor, <sup>2</sup>M.E .Student,  
Department of CSE,Babasaheb Naik College of Engineering,  
Pusad (India)  
<sup>1</sup>pornima\_niranjane@yahoo.com, <sup>2</sup>sush\_chavhan@rediff.com



SUSHMA D. CHAVHAN

### ABSTRACT

A web application has playing most important role in the online business. In this circumstances search engine optimization is playing most important role between user and web applications. Million of web pages are available user should need their specific search criteria such as business man have search the own needs, students have search their own needs and etc. Our aim is whatever user search and they can get information quickly. We develop a search engine called Fuzzy Go search engine, The proposed technique that is Fuzzy search engine reduce search time by using ontology user will get their answer to query with in less time and user doesn't want to wait for long searching.

**Keywords**-Search engine, fuzzy search engine, fuzzy ontology, web crawler, architecture of fuzzy search engine

©KY Publications

### I. INTRODUCTION

As the massive data on the internet is increasing rapidly, internet search engines have become the essential ways to find information. Most of existing search engines, such as Google, Yahoo, MSN, ASK and Bing, retrieve web pages by means of finding exact keywords. These keyword-based search engines collect and analyze web pages through web crawlers. While users input keywords to search web pages, web pages that contain exact keywords are retrieved and ranked. For example, the Google search engine sorts the search results by their Page-rank scores, Relevance scores and Local scores. However, traditional keyword-based search engines suffer several problems: Synonyms and terms similar to keywords are not taken into consideration to search web pages. Users may need to input several similar keywords individually to complete a search. The restriction of exact keywords makes it

inconvenient for users to search web pages. Many valuable web pages would be omitted if users did not search for several similar keywords individually. While users input several keywords to search web pages, different keywords may have different degrees of importance in their opinions. Traditional search engines treat all keywords as the same importance and cannot differentiate the importance of one keyword from that of another. The problem of information overload makes it difficult for users to find really useful information from large amount of search results. Traditional search engines lack an applicable classification mechanism to reduce the search space and improve the search results. To alleviate the mentioned problems, we have applied the fuzzy logic theory and the semantic search techniques to develop a fuzzy search engine, called Fuzzy-Go. First, a fuzzy ontology is constructed by using fuzzy logic to capture the similarities of terms

in the ontology, which offering appropriate semantic distances between terms to accomplish the semantic search of keywords. The Fuzzy-Go search engine can thus automatically search web pages that contain synonyms or terms similar to keywords. Second, users can input multiple keywords with different degrees of importance based on their needs. The totally satisfactory degree of keywords can be aggregated based on their degrees of importance and degrees of satisfaction. Third, the domain classification of web pages offer users to select the appropriate domain for searching web pages, which excludes web pages in the inappropriate domains to reduce the search space and to improve the search results. Existing search engines such as Google, Yahoo and MSN often return a long list of search results, ranked by their relevancies to the given query. Web users have to go through the list and examine the titles and (short) snippets sequentially to identify their required results. This is a time consuming task when multiple sub-topics of the given query are mixed together. Traditional search engines provide results in response to the user queries based on page ranking mechanism. The users of the Internet can generally still find the information they need even if it takes time to filter out all the redundant information. This can be justified by the observation that most of the web pages collected by web spider or internet robot are not relevant to the query of the user. In addition, the available information is way too much to be handled efficiently, and most of the available information are irrelevant to the user. Fuzzy search engine can thus automatically retrieve web pages that contain synonyms or terms similar to keywords. Second, users can input multiple keywords with different degrees of importance based on their needs. Third, the domain classification of web pages offers users to select the appropriate domain for searching web pages, to reduce the search space and to improve the search result. Exact and highly relevant matches appear near the top of the list. The Web Crawler is developed to gather and classify web pages. Web pages are classified and stored based on their domains. The characteristic information of web pages is recorded in the Web Document. The Ontology Manager constructs and maintains a Fuzzy

Ontology. A data mining approach is applied on the Web Document to calculate the fuzzy similarity between terms in the Fuzzy Ontology. The User Interface provides users to select an appropriate domain and to input multiple keywords with different degrees of importance based on their needs.

## II. What is Search Engine?

Searching is one of the most used actions on the Internet. Search engines as an instrument of searching, are special sites on the Web that are designed to help people find information stored on other sites. Every ordinary user on the Internet must have good knowledge about search engines and searching in order to explore the wonderful world that the Internet creates to a greater extent. Since the number of search engines is large and their features vary, learning them by comparing will be helpful to get the users more acquainted with them and therefore can use them better to find information needed as complete and accurate as possible.

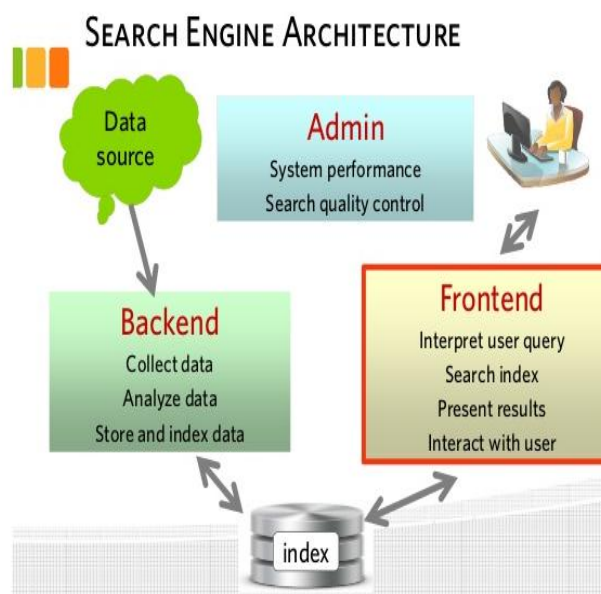


Fig. 1 General Architecture of Search engine

## III. What is Fuzzy Search Engine?

The Fuzzy search engine can thus automatically retrieve web pages that contain synonyms or terms similar to keywords. Second, users can input multiple keywords with different degrees of importance based on their needs. Third, the domain classification of web pages offers users to select the

appropriate domain for searching web pages, to reduce the search space and to improve the search results Exact and highly relevant matches appear near the top of the list. Fuzzy search engine work on a small amount of data but give the very sufficient result, in fuzzy search the approximate word is also get search, in fuzzy search the if we enter a singular word then in document if its plural word is present then also it show result. In our search engine we can enter a many word to search, store it in an array and search those word line by line in a search document. Now a day's fuzzy logic is used in various applications like washing machine, pressure cooker, iron, refrigerator etc. A fuzzy search is a process that locates web pages that are likely to be relevant to a search argument even when the argument does not exactly correspond to the desired information.

#### IV. What is fuzzy ontology?

ONTOLOGY is a conceptualization of a domain into a human understandable, machine-readable format consisting of entities, attributes, relationships, and axioms . It is used as a standard knowledge representation for the Semantic Web . However, the conceptual formalism supported by typical ontology may not be sufficient to represent uncertainty information commonly found in many application domains due to the lack of clear-cut boundaries between concepts of the domains. For example, a document can be very relevant, relevant, or irrelevant to a research area. In addition, keywords extracted from scientific publications can be used to infer the corresponding research areas. However, it is inappropriate to treat all keywords equally as some keywords may be more significant than others. To tackle this type of problems, one possible solution is to incorporate fuzzy logic into ontology to handle uncertainty data. Traditionally, fuzzy ontology is generated and used in text retrieval and search engines , in which membership values are used to evaluate the similarities between the concepts in a concept hierarchy. However, manual generation of fuzzy ontology from a predefined concept hierarchy is a difficult and tedious task that often requires expert interpretation. So, automatic generation of concept hierarchy and fuzzy ontology from uncertainty data of a domain is highly desirable.

#### V. Web Crawler

Google offers services to assist in creating customized search engines and subscribing for web links. We develop a crawler agent to automatically extract reserved web pages in Google's repository and inventory them by finding out keywords and characteristic values. While the Web Crawler retrieves webs pages, some important information of web pages is analyzed and stored, including titles, keywords, the page ranks of web pages, the last modified dates etc.

A web page may belong to several domains. While the fuzzy similarity between a cluster and a domain is greater than a threshold, we add all web pages in the cluster into the domain. The domain classification mechanism can reduce the search space and improve the search results.

#### VI. Architecture of Fuzzy Search Engine

Now a day's Internet is booming around, everyone uses internet, search for what they want and hope for the result they are expecting. Early days when there is exact search engine if there is a person don't know what exact he want to search he won't be able search what he want but in a fuzzy search engine it is not the case. Fuzzy search engine is work on a fuzzy set which has a degree of membership. This framework propose a mainly a general idea about the fuzzy search engine.

An overview of the Fuzzy-Go search engine is shown in Figure. The Web Crawler is developed to gather and classify web pages. Web pages are classified and stored based on their domains. The characteristic information of web pages is recorded in the Web Document. The Ontology Manager constructs and maintains a Fuzzy Ontology. A data mining approach is applied on the Web Document to calculate the fuzzy similarity between terms in the Fuzzy Ontology. The User Interface provides users to select an appropriate domain and to input multiple keywords with different degrees of importance based on their needs. The Fuzzy Search Mechanism would exclude web pages in the inappropriate domains to reduce the search space and to improve the search results. The keywords are expanded by the Fuzzy Ontology to find out synonyms and terms similar to keywords. The search results are ordering based on several fuzzy factors including the

satisfaction degrees of keywords, the importance degrees of keywords.

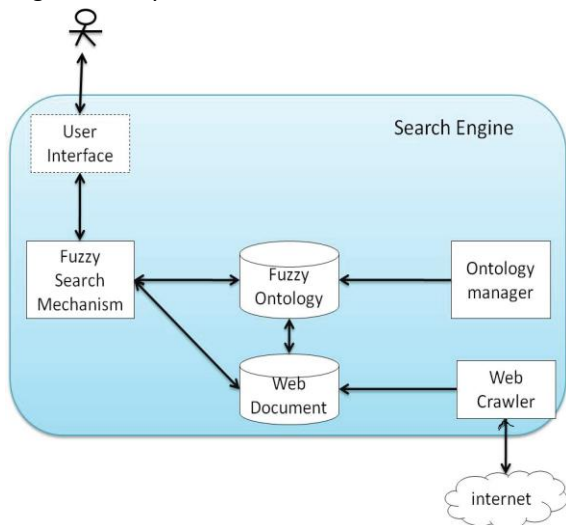
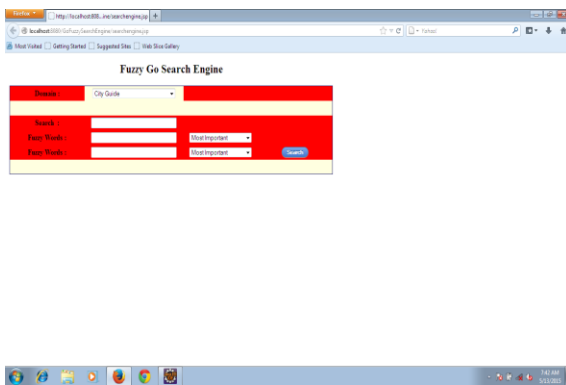


Fig. 2 Architecture of Fuzzy Search Engine

**VII. RESULT**

**A. Home Page of Fuzzy Go Search Engine:**

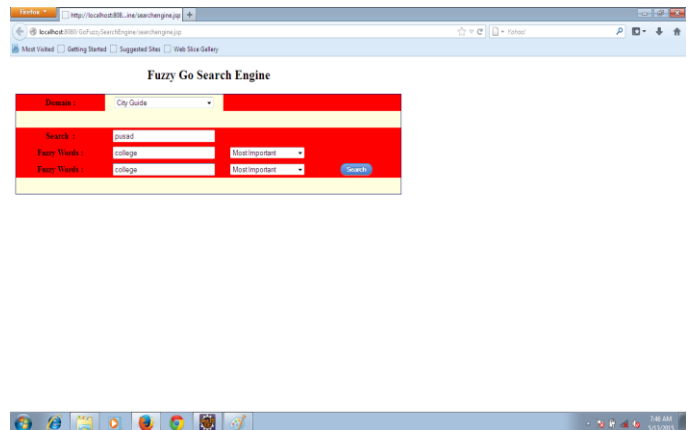
Homepage of Fuzzy Go Search engine is as follows. Here user will enter the query in the search box and click on search button.. Here we have provided two domain city guide and computer network which will collect information from Google and then It will perform clustering and ontology operation .



Snapshot 1: Home Page Fuzzy Search Engine

**B. For domain city**

If user select domain city and query for college and if select field most important then Web crawler collect all information from Google for given query



Snapshot 2. For city domain

**C. Comparison**

Following snapshot show comparison of google search and fuzzy search

Fuzzy Go Search Engine			Fuzzy Go Search Engine		
Search Results		Link	Fuzzy Ontology Results		Link
1	Babasaheb Naik College Of Engineering, Pusad	<a href="#">Link</a>	1	Babasaheb Naik College Of Engineering, Pusad	<a href="#">Link</a>
2	Babasaheb Naik College of Engineering - Pusad - Wikipedia, the ...	<a href="#">Link</a>	2	Babasaheb Naik College of Engineering - Pusad - Wikipedia, the ...	<a href="#">Link</a>
3	Phulking Naik Mahavidyalaya, Pusad	<a href="#">Link</a>	5	Welcome to S. N. Pharmacy College, Pusad	<a href="#">Link</a>
4	Welcome To NSPM Poly	<a href="#">Link</a>	6	Contact Us - Welcome to SN Pharmacy College, Pusad	<a href="#">Link</a>
5	Welcome to S. N. Pharmacy College, Pusad	<a href="#">Link</a>	7	Babasaheb Naik College of Engineering, Pusad - Maharashtra, Fees ...	<a href="#">Link</a>
6	Contact Us - Welcome to SN Pharmacy College, Pusad	<a href="#">Link</a>	8	Babasaheb Naik College of Engineering, Varanasi - Mangalore	<a href="#">Link</a>
7	Babasaheb Naik College of Engineering, Pusad - Maharashtra, Fees ...	<a href="#">Link</a>	12	Welcome To NSPM Poly	<a href="#">Link</a>
8	Babasaheb Naik College of Engineering, Varanasi - Mangalore	<a href="#">Link</a>	9	Babasaheb Naik College of Engineering, Pusad	<a href="#">Link</a>
9	Babasaheb Naik College of Engineering, Pusad - Wikipedia, the ...	<a href="#">Link</a>	10	Babasaheb Naik College of Engineering, Pusad - Wikipedia, the ...	<a href="#">Link</a>
10	Babasaheb Naik College of Engineering, Pusad - Wikipedia, the ...	<a href="#">Link</a>	11	Phulking Naik Mahavidyalaya, Pusad	<a href="#">Link</a>
11	Phulking Naik Mahavidyalaya, Pusad	<a href="#">Link</a>	11	Phulking Naik Mahavidyalaya, Pusad	<a href="#">Link</a>
12	Welcome To NSPM Poly	<a href="#">Link</a>	12	Welcome To NSPM Poly	<a href="#">Link</a>
13	Welcome to S. N. Pharmacy College, Pusad	<a href="#">Link</a>	14	Contact Us - Welcome to SN Pharmacy College, Pusad	<a href="#">Link</a>
14	Contact Us - Welcome to SN Pharmacy College, Pusad	<a href="#">Link</a>	15	Babasaheb Naik College of Engineering, Pusad - Maharashtra, Fees ...	<a href="#">Link</a>
15	Babasaheb Naik College of Engineering, Pusad - Maharashtra, Fees ...	<a href="#">Link</a>	16	Babasaheb Naik College of Engineering, Varanasi - Mangalore	<a href="#">Link</a>
16	Babasaheb Naik College of Engineering, Varanasi - Mangalore	<a href="#">Link</a>	3	Phulking Naik Mahavidyalaya, Pusad	<a href="#">Link</a>
			13	Welcome to S. N. Pharmacy College, Pusad	<a href="#">Link</a>

Snapshot 3: Comparison of Google and Fuzzy search engine

If user select city pusad and keyword college then fuzzy search engine display all colleges at the top rather than long list which is not useful to user in this way search space is reduce and searching quality is improved.

**VIII. CONCLUSION**

The proposed technique that is Fuzzy search engine reduce search time by using ontology user will get their answer to query with in less time and user doesn't want to wait for long search. Fuzzy search engine is the next generation search engine.

The Fuzzy-Go search engine can thus automatically search web pages that contain synonyms or terms similar to keywords. Second, users can input multiple keywords with different degrees of importance based on their needs. The totally satisfactory degree of keywords can be aggregated

based on their degrees of importance and degrees of satisfaction. Third, the domain classification of web pages offer users to select the appropriate domain for searching web pages, which excludes web pages in the inappropriate domains to reduce the search space and to improve the search results.

#### REFERENCES

- [1]. Lien-Fu, Lai Chao-Chin, Wu Pei-Ying Lin, Liang-Tsung Huang, "Developing a Fuzzy Search Engine Based on Fuzzy Ontology and Semantic Search", 2011 IEEE International Conference on Fuzzy Systems
- [2]. Yu-Cheng Lin Lien-Fu Lai Chao-Chin Wu, Liang-Tsung Huang, "A Self-Adaptation Approach to Fuzzy-Go Search Engine" Changhua, R.O.C.2010
- [3]. WordNet. <http://wordnet.princeton.edu/>
- [4]. Kamal Taha, Member, IEEE, "GOseek: A Gene Ontology Search Engine using Enhanced Keywords", 35th Annual International Conference of the IEEE EMBS Osaka, Japan, 3 - 7 July, 2013
- [5]. Shilpa Sagar Motghare, G. P. Bhole, "Design of Fuzzy Keyword Search Engine", Department of Computer Engg. & IT, VJTI, Mumbai, India
- [6]. Stefania GALLOVA, "Fuzzy Ontology and Information Access on the Web", Technical University of Kosice, Letna 9, SK-042 00 Kosice, Slovak, 2011
- [7]. Quan Thanh Tho, Siu Cheung Hui, Senior Member, IEEE, A.C.M. Fong, Senior Member, IEEE, and Tru Hoang Cao, "Automatic Fuzzy Ontology Generation for Semantic Web, JUNE 2006
- [8]. Nidhi Sharma, Atul Srivastava, "Ontological Paradigm for Focused Crawling based on Lexical Analysis", Department of Computer Science Echelon Institute of Technology Faridabad, India, 2013