Neuro-Fuzzy Based Integrated and Optimized Search Engine for Effective and Reliable Information Retrieval System

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ABSTRACT
In this paper, we have presented neuro-fuzzy based simulated model to integrate the search engines, to optimize the working pattern of search engines. The combined approach of neural network and fuzzy logic makes proposed approach attractive because ability of neural network to represent the best possible solution of result set produced by the search engines and fuzzy logic to handle the uncertain query term fired by the users. Simulated view of search engine will be able to produces effective and reliable result for the users query.

Keywords
Information Retrieval System, Search Engine Optimization, Neuro –Fuzzy Technique.

1. INTRODUCTION
Search engine are the most prominent tool to extract information form web (www). The World Wide Web is very large distributed digital information [1]. Since 1990 popularity of internet user's increases gradually, number of software, application tool, and websites has been developed by organization to increase their productivity, economic status to the competing world. The Information retrieval has become difficult for user because variant search engine, now a day different category search engines are available to extract the information from system. In a current scenario search engine has been divided into various category according to the user's queries pattern. User enters uncertain queries but his expected outcome is very difficult to present in real form so it become very complicated to handle such queries. Problem associated with search engine i.e for the common query submitted by the user on different search engine produce results set differently, this creates problem for user to select the correct result from varieties of result.

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2. EXISTING APPROACH: SEARCH ENGINE WORKING PATTERN
Most of the search engines working pattern are based ranking of indexed term, automation (automatic) of term matching pattern. User fire his query and search engine start matching the key term. As we all know that, different search engine service provider's needs to maintain their records and information in several database system that could be centralized, decentralized or both for information extraction. There may be conflict in data access pattern search engine may not be able to find the expected result for submitted queries or users may get incorrect or ambiguous information. This leads failure of search engine.

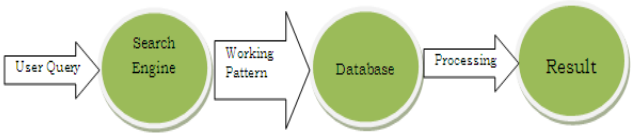
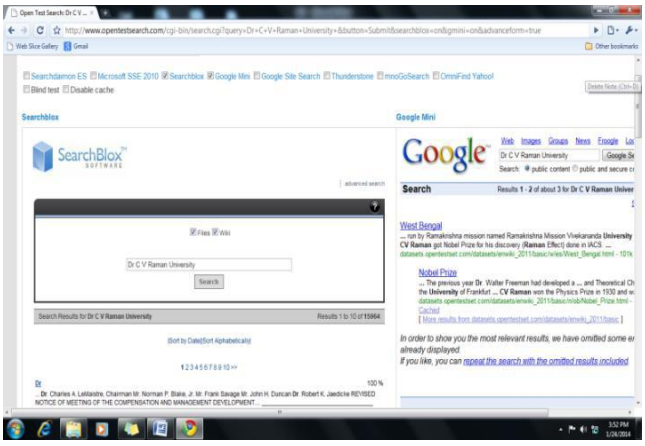


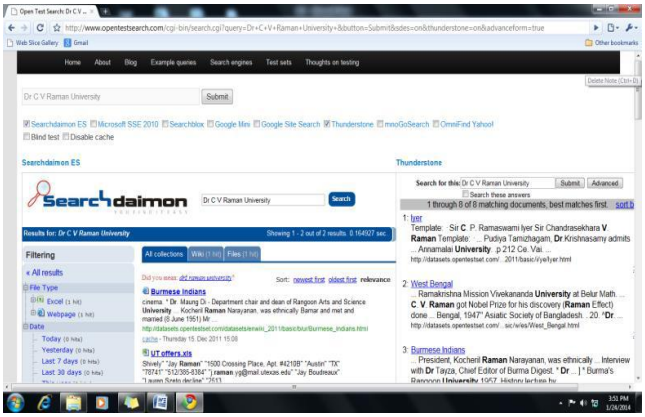
Figure 1. Traditional Working Pattern of Search Engine

Searching of key term in different search engine and snapshots of result are shown below

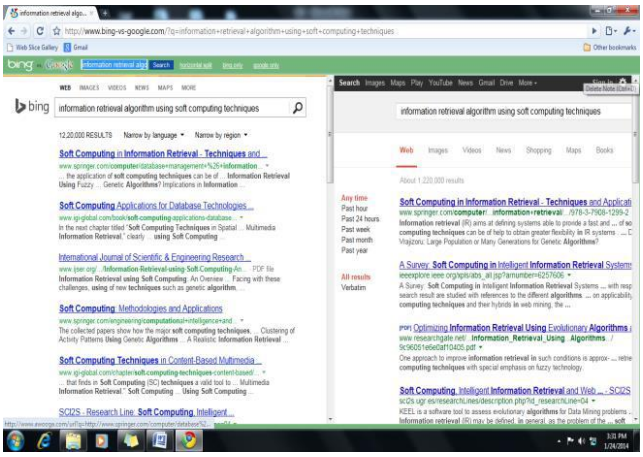
Snapshot 1: Result Comparison Search Box and Google



Snapshot 2: Result Comparison Searchdaimon ES and Thunderstone



Snapshot 3: Result Comparison Bing and Google



In above snapshots, we have shown the results of traditional search engines result, once users submit his query to search engine, immediately search engine start searching and display some result, even though their my not be expected data in database but it defiantly produces minimum 20-50 useless links, users need to select that which one is his expected result. He needs to spend extra only for result selection without doing use full work. In above snapshots we have checked the search engine working pattern for common query term Dr CV Raman University in some popular search engines – Google, SearchBox, Delta Search, Bing, Thunderstone, Searchdaimon, where we observed that there is conflicts in results.

3. NEED OF INTEGRATION OF SEARCH ENGINE

Increasing research and technology makes search engine popular according to their data extraction pattern, most of the search engine are user specific, and they have been designed for the specific group of users. This creates problem while selecting particular search engine because users are not aware about the search engine that which is associated with what kind of database.

4. PROPOSED MODEL FOR SEARCH ENGINE OPTIMIZATION

As we know that dozen's of search engine are available and using separate database to fulfill the selected query, some time selection of search engine may affect the result of users because the selected query database may not be available in that server machine, or it may be available in other search engine database, even though result is available in any of the server but that is useless if it is not available to the users, we have proposed model to resolve the issues associated with current search engine where need to integrated the search engines.

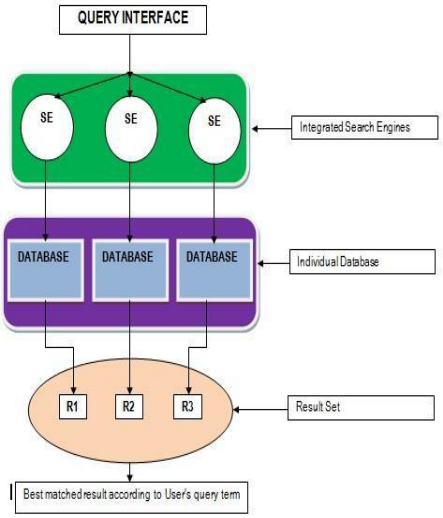


Figure 2. Proposed View of Integrated Search Engine

5. SIMULATION OF PROPOSED INTEGRATED VIEW OF SEARCH ENGINE

We have selected sandwiched of Neural Network and Fuzzy Logic as tool to simulated the actual working behavior of integrated search engine optimization technique because ability of neural network to handle the result set produced from different node and fuzzy logic to handle the uncertain query term enter by the User's, neural network is also capable to handle any error condition, Here we have represented the whole information retrieval system as multilayered feed forward artificial neural network where User's passes their fuzzy preferences to integrated optimized search engine.

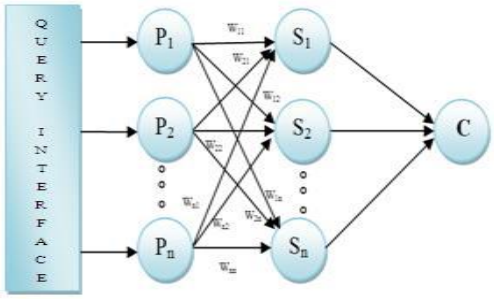


Figure 3. Simulated Neuro-Fuzzy Integrated Model

As shown in figure there is four major sections in inte-grated model: Query Interface, Search Engine (P_1, P_2, ..., P_n), Database (S_1, S_2, ..., S_n) and Result Optimizer (C).

6. WORKING OF PRPOSED APPROACH

In this proposed approach, User submit his/her query term to the search engine interface and passed to input layer integrated search engines, each of the search passes again their weight to interconnect database to find the best possible results of different database. Each of the search engine produce result set according to their working pattern which is purely hidden from the users view, finally there will be another tool known as search engine result optimizer, responsibility of result optimizer is to filter the best result set for the user as per their submitted query term. This strategy could be more attractive and reliable in terms of user satisfaction. User doesn't need to worry about the final result because it is the filter result and all possible result set which is available in all server machines.

7. CONCLUSION

The proposed integrated search engine optimization model for information retrieval and its simulated model using neural network and fuzzy logic system makes our approach more attractive and reliable as well as we have focused on the drawbacks of search engines, where user need to refine his query to find out the expected result and selected search engine does not guaranteed that user will get that result because it may not be available in the server machine which being used by the user. We have resolved this shortcoming by introducing integrated architectural model of search engine optimization for easy, effective and reliable information retrieval.

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