

A Neuro Fuzzy Approach for Personalized Multi Interest Information Filtering

Mr. Shoeb Ahmed Khan, PRMCEAM Badnera, Amravati University, Prof. P.A.Khodke, Dept. of Computer Science & Engg. PRMCEAM Badnera, Amravati University.

Abstract—Information gathering in Internet is a complex activity and Internet users need systems to assist them to obtain the information required. Examples of such systems include Web search engines, meta-search engines, multi-agent systems and information filtering systems. This paper proposes on an improved personalized adaptive neural fuzzy network providing an information filtering system for the Web to sort the results provided by external search engines.

Index Terms—Information gathering, fuzzy network, information filtering.

I. INTRODUCTION

The amount of information available on the internet is possibly infinite so for the ease of the user, information filtering is the need of the hour. An Information filtering system is that removes redundant or unwanted information from an information stream using (semi) automated or computerized methods prior to presentation to a human user. Whenever a user is searching for information on the web he could have many things predefined and would want the search results relevant to that predefined ideas.

Mr. Shoeb Ahmed Khan is with PRMCEAM Badnera, Amravati University, India (e-mail:shoebkhan8487@gmail.com).

Prof .P.A.Khodke is with PRMCEAM Badnera, Amravati University, India (e-mail:preeti.khodke@rediffmail.com).

Providing the relevant results to the multi interest user is the task performed by Information filtering system. User interest has shown their increasing importance in driving the development of personalized web services and user centric application. Existing studies on analyzing user interests focus on browsing behaviors (such as duration) and browsing contents (such as viewed web pages). User interests are fuzzy, blended and cross multiple categories. Artificial intelligence and machine learning are needed to improve information retrieval systems.

II. PROBLEM DEFINITION

Information gathering from Internet is a complex activity and Internet users need systems to assist them to obtain the information required and the information which is relevant. The exponential increase of Web sites and Web documents is contributing to that Internet users not being able to find the information they seek in a simple and timely manner. Users

are in need of systems to help them cope with the large amount of information available on the Web. Examples of such systems include Web search engines, meta-search engines, multi-agent systems and information filtering systems. We plan on an improved adaptive neural fuzzy network providing an information filtering system for the Web to sift the results provided by external search engines. The paper focuses on developing a personalized information filtering system for Multi-Interest user so that the information that is given by the search result is more relevant to the user interests and that could be done by analyzing the behavior of the user such as the time spent the previous web sites and then analyzing web history of the previous web results.

III. RELATED WORK

In[6], Dai Xuewu et al. proposed a hybrid information system, combining user modeling and neural fuzzy networks , for ranking and selecting HTML pages from the result pages provided by external search engines and they attempt to resolve the problem of describing user multi-interests to improve the precision of current search facilities. The proposed system recommends the relevant pages to users according to the multi - interests. To do this, the system makes use of a User Modeling system [7],Geoffrey I.Webb et al. to acquire, store and restore the user's interests and non-interests. An advanced neural fuzzy network is applied to provide adaptive information filtering. The distinguishing features of the presented system are not only embedding a user model in the neural fuzzy network to process the user's mixed interests, but also the replacement of the traditional cosine measure method by a parameterized nonlinear map , so that it becomes straight forward to process the multi-interests.

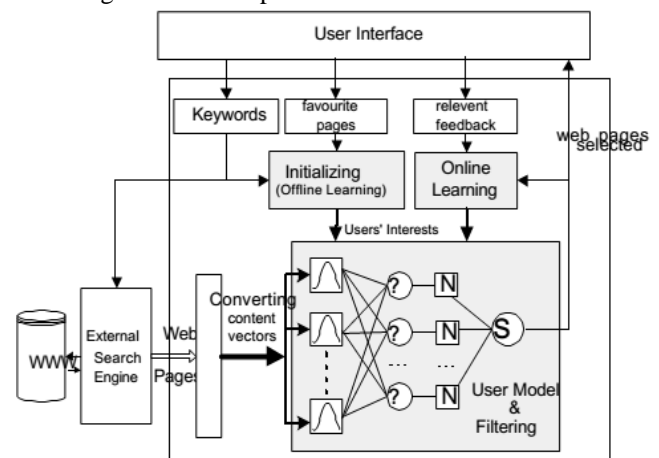


Figure 1.

Derived from the neuro-fuzzy network ANFIS (Adaptive Neuro-Fuzzy Inference System) [12], Widrow et al., the proposed technique consists of two main concepts: structure identification (comprising a resource model and a user model) and parameter identification (comprising a filtering algorithm and a learning algorithm). Information gathering in Internet is a complex activity. Find the appropriate information, required for the users, on the Web is not a simple task. This problem is more acute with the ever increasing use of the Internet. To improve the information access on the Web the users need tools to filter the great amount of information available across the Web.

IF is a name used to describe a variety of processes involving the delivery of information to people who need it. It is a research area that offers tools for discriminating between relevant and irrelevant information. IF systems are characterized because the author Geoffrey I. Webb et al. are applicable for unstructured or semi-structured data (e.g. web documents or email messages), are based on user profiles, handle large amounts of data, deal primarily with textual data and their objective is to remove irrelevant data from incoming streams of data items. Traditionally, these IF systems have fallen into two main categories. Content-based IF systems filter and recommend the information by matching the terms used in the representation of resources, ignoring data from other users. Collaborative IF systems use explicit or implicit preferences from many users to filter and recommend documents to a given user, [11], Wang Hongsheng et al. ignoring the representation of the resources. In this kind of systems, the users' information preferences can be used to define user profiles that are applied as filters to streams of documents; the recommendations to a user are based on another user's recommendation with similar profiles. The construction of accurate profiles is a key task and the system's success will depend on the ability of the learned profiles to represent the user's preferences [13], Xiyuan Wu. Several researchers are exploring hybrid content-based and collaborative IF systems to smooth out the disadvantages of each one of them [1], Aniscar et al.

The author [3] C. Porcel et al. present a new model of Web multi-agent system to access and retrieve information on the Web that incorporates in its activity the use of fuzzy multi-granular linguistic information to improve the user-system interaction. The communication among the agents of different levels and among the agents and users is carried out by using fuzzy multi-granular linguistic information, i.e., the different types of information that participate in the activity of the Web multi-agent system (query weights, user satisfaction degrees, relevance degrees, recommendations) [9] Ranghvan et al. are assessed with different uncertainty degrees, using several label sets with a different granularity of uncertainty.

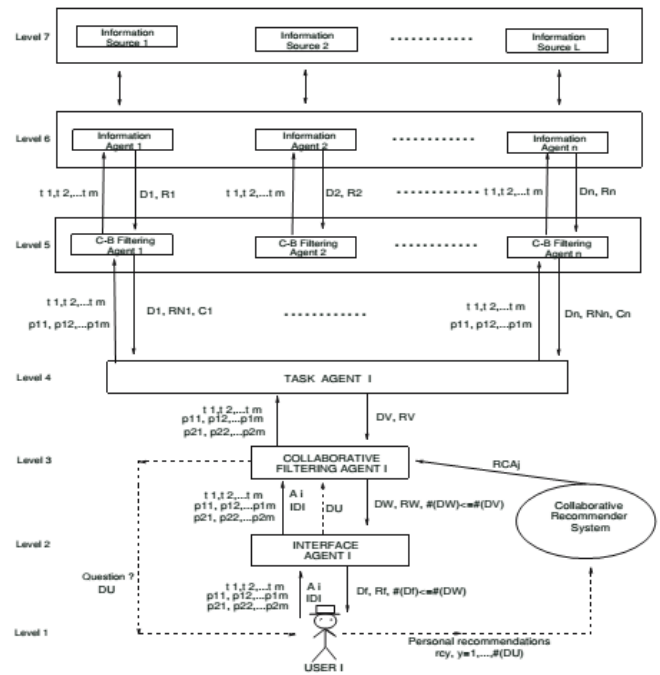


Figure 2. Structure of a Multi agent model based on Filtering agents

The author in[13], Young-Woo Park et al., propose a learning mechanism that can be used in making it easier to construct the user profile. The author makes use of the user's relevance feedback and they select key-terms in the documents for making profile. With using this profile we can filter the retrieved information and represent more relevant information to user in [10].

The author in[4], Chunjie Li, introduces the Multi-agent intelligent technology into four kinds of search behavior analysis, including the user search keywords, the server logs information, the user downloading and having information, the visit time on the web pages in [12].

V. CONCLUSION

This paper gives an overview of the various technologies and methodologies for Information Filtering of the web that are accessed by the user and based on the web history of the the user more relevant results can be obtained by applying a neuro fuzzy modeling and training the system accordingly.

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