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REVIEW ARTICLE

Review on: Generation of Multimedia Answer by Gathering Web Information

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Abstract— From past few years community Question Answering (cQA) services have gained enormous popularity. It basically allows members of community to post and answer questions and also enables general users to obtain information from a comprehensive set of properly answered questions. However, existing cQA firms usually provide only textual answers, which are not informative enough for numerous questions. Through this system, we propose an idea that is capable to enrich textual answers in cQA with appropriate and meaningful media data. This system consists of three components: answer type selection, query development for multimedia search, and multimedia information selection and presentation. This method automatically identifies which type of media information should be added with a textual answer. It then automatically collects data from the web to enrich the answer. By processing this huge set of QA pairs and adding them to a pool, this system can enable a unique multimedia question answering (MMQA) approach as users can find multimedia answers by just matching their questions with those in the pool. Distinguishing from a lot of MMQA research efforts that strive to directly answer questions with image and video data, this system is generated based on community-contributed textual answers and so it is having the ability to deal with more complex questions. Different experiments on a multi-source QA dataset have been conducted. The results actually demonstrate the effectiveness of the system's approach.

Keywords— Bigram text features and verbs, cQA (Community question answering), Medium selection, MMQA (Multimedia Question Answering), Question answering, Histogram

I. INTRODUCTION

Question answering (QA) is a method for automatically replying a question that is posted in natural language. Comparing to search systems based on keywords, it enormously facilitates the communication between computer systems and humans. It also avoids the painful job of browsing the very vast amount of informative content which is returned as correct answers by search engines. However, fully automated QA is still facing challenges which are not easy to handle, such as keen understanding of complex questions and the sophisticated syntax, semantics and contextual processing to achieve expected answers. It is observed that, mostly automated approach is not capable of obtaining the results that are as good as those generated by human intelligence.

Along with the rapid increase and improvement of existing communication technologies, community Question Answering has emerged as a tremendously popular alternative to gain information online, owing to the following facts. First information seekers are able to post their specific questions on any topic and obtain answers provided by other participants. By leveraging community efforts, they are able to get better answers than simply using search engines. Second, in comparison with automated QA systems, cQA receives answers with better quality as they are generated based on human intelligence.

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Third, over times, a tremendous number of QA pairs, have been accommodated in their repositories, and it facilitates the preservation and search of answered questions. For example, WikiAnswers one of the most well-known cQA systems, hosts more than 13 million answered questions distributed in 7000 thousand categories (as of august 2011).

II. PROBLEM DEFINITION

Textual answers may not always provide an adequate natural and easily understandable information. The system's approach would help provide answer gainers more concise, comprehensive information and better experience. As picture speaks a thousand words, we are suggesting a basic idea from this system that not only concise textual information but also other multimedia information can be teamed up with this textual answer to better emphasize it and thus provide a better experience to the general users.

III. RELATED WORK

In early 1960s the research work of QA systems started and mainly highlighted on limited domains. After the establishment of QA track in TREC in late 1990s, textual QA started gaining popularity. On the basis of variance between the questions and expected answers, the system can briefly present the sorts of question answers into specific-domain question answer, open-domain question answer, definition question answer and list question answer. Even after the above achievements, the fully automated QA still faces problems in replying the complicated questions. Almost all of the present generation cQA system such as WikiAnswers, Yahoo!Answers and Ask metafilter, provides the answers only in textual format which may not be always sufficient for the users.

IV. PROPOSED SYSTEM

For enhancing text-based search performance, system performs search by generating queries and the proposed system is online system. System gathers image and video data from Google video and image search respectively. Most of recent search engines are developed upon text-based indexing and probably returns irrelevant results. Firstly there is a general user who requires answers of various questions. A question is entered by the user. Question entered by user can be of any type, but one thing to make sure about this question is that it she should be of textual type. In enhancing generation of answer the question from user is taken and multimedia answer is generated. To generate multimedia answers different variety of queries are produced at back end. In this system interaction between computer and machine is maximum. This system avoids the painful job of browsing process to explore relevant answers. These queries are actually processed and are then send to internet from which the information is extracted. For example, query is forwarded to WikiAnswers for text answers, for images Google Images and so on. Different formats for generated answers can be: Text + Image + Video, Text+ Image, Text + Video, Text. As per the question, relevant answers are provided to the user which can be in any form as mentioned above. Sometimes question needs only image as its relevant answer; for a given question like, "What is the capital of USA" it would become easier for the general user to better identify and understand the answer, if it is generated in image form. The system performs a unique feature of removing duplicity of images by using Image Histogram.

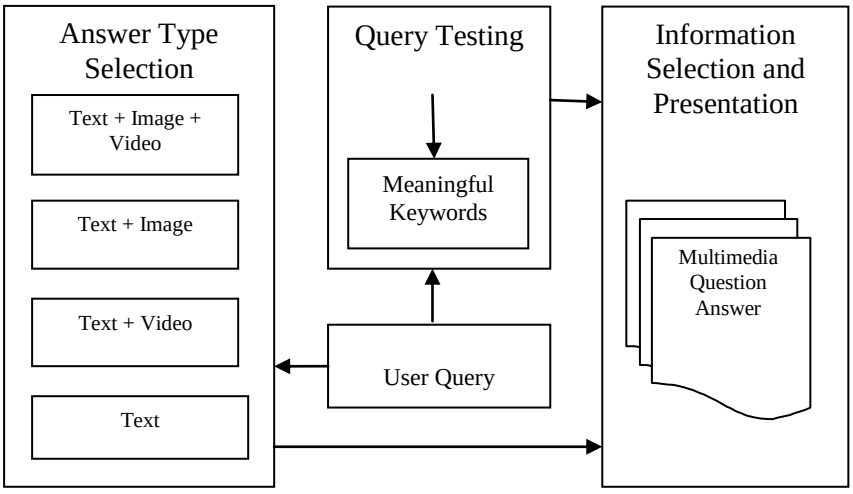

Fig. 1 System Architecture

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A. Answer Type Selection

From a given QA Pair, it determines that the textual answer can be supported with which type of multimedia data and thus add this multimedia data in the answer. Basically, the system categorizes the answers into one of the following types that is Text + Image + Video, Text + Image, Text + Video, Text. This actually summarizes that the system automatically gathers videos, images, and combination of videos and images to enhance the original textual answers. The process of selecting a valid type of media data is performed in two ways. Priorly, the system analyzes the questions, answers and the performance of multimedia search. Secondly, classification based on Naïve Bayes Classifier is used.

1) Classification Based on Question

This classification has to be done in two ways. Priorly, the system sorts the questions based on wh-questions and through this the system can easily determine which questions can be directly answered with text. For the other questions the system performs Naïve Bayes Classifier. For constructing Naive Bayes Classifier the system extracts set of text features, it includes Bigram text features, head words, and set of related words. The meaning of head words has a vital role in identifying answer type. The system also extracts a set of related words. The system first calculates the appearing frequency of each phrase in positive samples of each type of media data. All the phrases having the value above the given threshold value are gathered. The examples of related words are shown in Table 2.

TABLE 1
DESCRIPTION OF WH – QUESTIONS

Wh – Questions	Category
have, be there, when, will, be, can, how + adv/adj	Text
how to, who, which, why, where, what, etc.	Further classification required

TABLE 2
DESCRIPTION OF RELATED WORDS

Categories	Classification of Related Words
Text + Image + Video	singer, event, war, nuclear, prime minister, earthquake, president, battle, happened, issue, murder, king, kill, etc.
Text + Image	appearance, band, what is a, logo, surface, mass, image, clothes, look like, capital, whom, who, symbol, figure, color, pet, family, pictures, largest, photo etc.
Text + Video	songs, music, dance, recipe, differences, ways, said, first, tell, story, film, how do, how can, how to, etc.

2) Classification Based on Answer

Rather than questions, answer can also be considered as vital clue. In answer classification, the system extracts bigram text features and verbs. The verbs available in an answer can be useful for evaluating that whether the answer can be enriched with video content. Verbs can be proved as an important clue when textual answers consist of complex verbs and thus probably describes a dynamic process and so it has a very high probability to be answered well by video data.

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3) Multimedia Search Analysis

Sometimes, the related information on the web can be limited or can be hardly gathered even after determining a valid answer type; in this case it is required to switch to another multimedia answer type. For example, a particular question can be better answered using image content, but image resources for this particular question or topic on the internet is too hard to identify on current search engine. In such a condition it is expected to take into consideration the searching performance of all other media types.

B. Query Testing

For gathering multimedia information, the system has to produce informative and meaningful queries. For a given Question answer pair, this module extracts different types of queries from the question, answer and from the combination of QA pair respectively. The most appropriate query will be selected by a three-class classification model.

C. Multimedia Information Selection and Presentation

On the basis of generated queries, the system gathers images and video data from multimedia search engines. Later the system performs the process of re-ranking and duplicate removal to obtain a set of appropriate and representative videos and images to enrich original textual answers. The system performs search using generated queries to gather images and video data from Google images and video search engine respectively. Although most recent search engine are constructed upon text-based indexing and probably returns irrelevant results. Hence re-ranking by determining visual data is essential to re-sequence the initial text-base search results.

V. CONCLUSION

In this paper, we describe the real motive and revealing the idea of MMQA (Multimedia Question Answer) and it is observed that the existing approaches mainly highlight on set of limited domains. Our goal is to propose an unusual scheme to reply to the questions using multimedia data by taking the effort of exaggerating the textual answers in cQA. For a pair of given QA, our system priorly determine which type of medium is suitable for emphasizing the original textual answer. Succeeding that it automatically develops a query based on QA knowledge and then using this query, it performs multimedia search. Lastly, query-adaptive re-ranking and removal of redundancy are performed to achieve set of images and videos to represent along with the original textual answers. Distinguishing from the conventional MMQA research that focuses on automatic generation of multimedia answer with given questions, our approach is constructed based on the answers contributed by the community and thus can deal with more generic questions and acquires better performance.

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