EXPLOTING RELEVANT SEMANTIC RULE MINING FOR IMAGE ABSTRACTION

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ABSTRACT

Relating visual information to its linguistic semantic meaning remains an open and challenging area of research. The semantic meaning of images depends on the presence of objects, their attributes and their relations to other objects. But precisely characterizing this dependence requires extracting complex visual information from an image, which is in general a difficult and yet unsolved problem. In this paper, we propose studying semantic information in abstract images created from collections of clip art. Abstract images provide several advantages over real images. They allow for the direct study of how to infer high-level semantic information, since they remove the reliance on noisy low-level object, attribute and relation detectors, or the tedious hand-labeling of real images. Importantly, abstract images also allow the ability to generate sets of semantically similar scenes. Finding analogous sets of real images that are semantically similar would be nearly impossible. We create 1,002 sets of 10 semantically similar abstract images with corresponding written descriptions. We thoroughly analyze this dataset to discover semantically important features, the relations of words to visual features and methods for measuring semantic similarity. Finally, we study the relation between the saliency and ability of objects and their semantic importance.

1. INTRODUCTION:

The Semantic Web is an extension of the current Web that allows the meaning of information to be precisely described in terms of well-defined vocabularies that are understood by people and computers. On the Semantic Web information is described using a new W3C standard called the Resource Description Framework (RDF). Semantic Web Search is a search engine for the Semantic Web. Current Web sites can be used by both people and computers to precisely locate and gather information published on the Semantic Web. Ontology is one of the most important concepts used in the semantic web infrastructure, and RDF(S) (Resource Description Framework/Schema) and WOL (Web Ontology Languages) are two W3C recommended data representation models which are used to represent ontologies. The Semantic Web will support more efficient discovery, automation, integration and reuse of data and provide support for interoperability problem which can not be resolved with current web technologies. Currently research on semantic web search engines are in the beginning stage, as the traditional search engines such as Google, Yahoo, and Bing (MSN) and so forth still dominate the present markets of search engines. Information retrieval by searching information on the web is not a fresh idea but has different challenges when it is compared to general information retrieval. Different search engines return different search results due to the variation in indexing and search process. Google, Yahoo, and Bing have been out there which handles the queries after processing the keywords. They only search information given on the web page, recently, some research group's start delivering results from their semantics based search engines, and however most of them are in their initial stages.
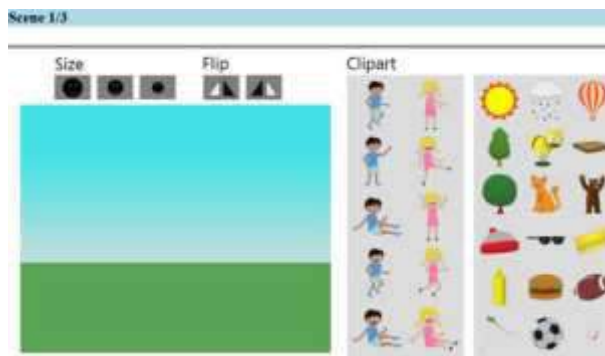
2. PRELIMINARIES

Web Image Search Re-Ranking :

Web image search reranking is emerging as one of thepromising techniques for automotive boosting of retrievalprecision. The basic functionality is to reorder the retrievedmultimedia entities to achieve the optimal rank list by exploitingvisual content in a second step. In particular, given atextual query, an initial list of multimedia entities is returned using the text-based retrieval scheme. Subsequently, the mostRelevant results are moved to the top of the result list whilethe less relevant ones are reordered to the lower ranks. Assuch, the overall search precision at the top ranks can beenhanced dramatically. According to the statistical analysismodel used, the existing reranking approaches can roughlybe categorized into three categories including the clusteringbased, classification based and graph based methods.

The paper[16] used description logic (DL), the semantic knowledge base can be perceived as consisting of the terminological knowledge box (TBox) and the assertional knowledge box (ABox). The Tbox refers to statements that describe the hierarchy of concepts, and the relationships between concepts, whereas the Abox refers to statements regarding the belonging of individuals to concepts, and the relationships between individuals.

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relationships between concepts, whereas the Abox refers to statements regarding the belonging of individuals to concepts, and the relationships between individuals.

This paper demonstrated the ability of humans to endow even simple objects such as triangles and circles with the emotional traits of humans. Similarly, cartoons or comics are highly effective at conveying semantic information without portraying a photorealistic scene. Inspired by these observations we propose a novel methodology for studying semantic understanding.

In this authors describe the study of relationships of objects, which typically convey information relating to more active verbs, such as "riding" or "playing". In this work, they explicitly identify which types of visual features are informative for different parts of speech[18].

Isola et al. found that despite this expected variability, there is also a large degree of agreement between users. This suggests that there is something intrinsic to images that make some more memorable than others. Isola et al. quantified the memorability of individual images in and then identified semantic characteristics of images that make them memorable in[19].

Image Annotation :

The aim of annotation methods is to attach textual labels to un-annotated images or the unlabelled images, as the descriptions of the content or objects in the images. The final goal of image annotation is mostly to perform image retrieval by providing users with a text based interface for search. The image annotation preferred because as the countless images exist in our lives it is not possible to annotate them all by hand. And so annotation by computer is a potential and promising solution to this problem precisely. The ability to annotate images semantically based on the objects that they contain is essential in image retrieval as it provides the mechanism to take advantage of existing text retrieval systems.

Image Retagging Approach :

The high-level meanings can be associated to images or image regions through image tagging, also known as captioning or

annotations. Tagging improves the content of images and helps image retrieval search engines to better retrieve desired images in response to text queries. For this wordnet is been integrated.Images can be tagged with a variety of descriptions, keywords and structured metadata. While image tags are a set of keywords, metadata is a structured way of expressing the image descriptions.

Hyper graph distance measure :

HDM stands for Hypergraph Distance Measure Algorithm. Web image search reranking is emerging as one of the promising techniques for automotive boosting of retrieval precision. The basic functionality is to reorder the retrieved multimedia entities to achieve the optimal rank list by exploiting visual content in a second step. In particular, given image query, an initial list of multimedia entities is returned using the image-based retrieval scheme. Subsequently, the most relevant results are moved to the top of the result list while the less relevant ones are reordered to the lower ranks As such, the overall search precision at the top ranks can be enhanced dramatically.

Matching module :

Matching Module takes SPARQL query as input from the Query Engine and executes the same on the Semantic Knowledge Base to retrieve the most related images. If the query results in successful search, the output images are passed to ranking module for result ranking.

Ranking & Re-Ranking :

Ranking module is responsible to rank the images according to relevance with the user query. The resultant image set passed by Query Matching Module contains image and matching value (which is calculated as a sum of matched semantic concepts with reference to user query); the result set is sorted in descending order according to the matching value. After sorting, top ten images are displayed to the user (i.e. most matched images are showed first) and the remaining are displayed on user request in the decreasing order.
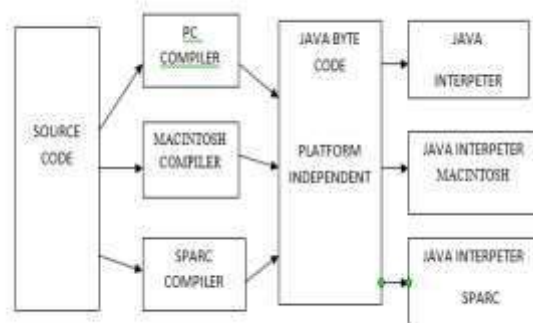
3. EXISTING SYSTEM:

The existing system is a keyword based search engine where accuracy and relevancy is missing. No semantic based similarities is implemented in the existing system. The work of Biederman et al split the set of spatial relationships that can exist in a scene into five unique types and study the relationships of objects, which typically convey information relating to more active verbs, such as "riding" or "playing". Also in existing system if a large sentence is given accuracy falls down tremendously. Many image search engines such as Google and Bing have relied on matching textual information of the images against queries given by users. However, text-based image retrieval suffers from essential difficulties that are caused mainly by the incapability of the associated text to appropriately describe the image content. Existing re-ranking approaches are based on low-level visual features

Visual reranking method categorized into

➢ Clustering based
➢ Classification based
➢ Graph based method

The cluster based re ranking method stem from the key observation that a wealth of visual characteristic.Purely based on low level visual feature while generally do not consider any semantic relationship among initial ranked list.

Disadvantages:

➢ Searching result is highly diverse

➢ Visual pattern not clear.

➢ Classification problem when identify whether each relevant or not.

➢ In existing system there is lack of accuracy and relevancy.

➢ There is no semantic based search is been implemented
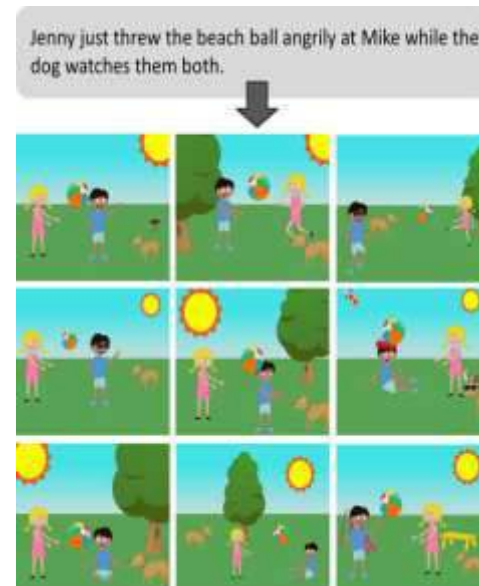
4. PROPOSED SYSTEM:

Since there is lack of availability of abstract images, We are using real images for processing. To extent the research we propose to implement semantic based search in web URL's also by various datasets in various categories.
The proposed method uses images for three purposes
  1.To make set of similar semantic words
  2.With use of saliency, we can relate many words.
  3.The memorability of the picture has strong impact in   our mind.
Proposed to refine text-based search results by exploiting the visual information contained in the images. After a query "baby" is submitted, an initial result is obtained via a text-based search engine. It is observed that text-based search often returns "inconsistent" results. In a fast and accurate scheme is proposed for grouping Web image search results into semantic clusters. It is obvious that the clustering based reranking methods can work well when the initial search results contain many near duplicate media documents. Hypergraph Distance Measure Algorithm is been proposed for search optimization.

Advantage :

* Can represent the same complex relationships that exist in natural scenes, and additional datasets may be generated to explore new scenarios or scene types.
* Future research on high-level semantics will be free to focus on the core problems related to the occurrence and relations between visual phenomena.
* To simulate detections in real images, artificial noise may be added to the visual features to study the effect of noise on inferring semantic information.
* Search accuracy and relevant meaning based images are only shown.
* Search optimization is performed using wordnet to find all possible synonyms for the keywords.

* Increasing attention as demonstrated to be effective.
* Improve the effectiveness of rank lists.

5. CONCLUSION

Semantic Content Based Image Retrieval system applied to comic books. The final aim would be to provide a complete system that would be able to (1) retrieve resources similar to a query, based on the amount of mutual properties they share and the significance of these properties guided by the user relevance feedback, and explain to the user why a returned resource is considered to be relevant to the query.

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