

자동 주석을 위한 멀티 큐 통합

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Multi-cue Integration for Automatic Annotation

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● 요약 ●

WWW images locate in structural, networking documents, so the importance of a word can be indicated by its location, frequency. There are two patterns for multi-cues ingegration annotation. The multi-cues integration algorithm shows initial promise as an indicator of semantic keyphrases of the web images. The latent semantic automatic keyphrase extraction that causes the improvement with the usage of multi-cues is expected to be preferable.

키워드: multi-cue integration algorithm, web image, semantic automatic keyphrase

I. Introduction

With the development of the Internet and the relevant technologies, and the availability of image capturing devices such as digital cameras, image scanners, the usage of images in HTML web pages is now predominant. These images can enrich the content of web pages and enable users to get intuitionistic understanding of the content. This large collection of digital images becomes an important source from which users can get their target images with interest. How to get the most relevant results to the search query becomes an important issue.

In the earlier image retrieval systems, images are annotated manually by text descriptors. There are two disadvantages with this approach. The first is a considerable level of human labour is required for manual annotation. The second is the annotation inaccuracy due to the subjectivity of human perception. To overcome these two disadvantages in text-based retrieval systems, content-based image retrieval was introduced [1]. In CBIR, images are indexed by their visual features, such as color, texture, shape. Though many sophisticated algorithms [2, 3, 4] have been designed to describe color, shape and texture features, these algorithms cannot adequately model image semantics and have many limitations when dealing with broad content images databases.

II. Multi-cue

WWW images locate in structural, networking documents, so the importance of a word can be indicated by its location, frequency. There are two patterns for multi-cues ingegration annotation.

Linear Integration

In this paper, we use the below multi-linear integration formula Eq. 1 to compute word weight in documents:

$$W(t, \bar{d}) = \alpha W_{tag}(t, \bar{d}) + \beta W_{tfidf}(t, \bar{d}) + \gamma W_{sr}(t, \bar{d}) \quad (\text{Eq. 1})$$

The importance of token t in document d consists of three cues' weight:

TAG weight $W_{tag}(t, \bar{d})$, TFIDF weight $W_{tfidf}(t, \bar{d})$, SR weight $W_{sr}(t, \bar{d})$, α, β, γ are influentiality of each weight. After the weight is computed, some (for instance, 4) are chosed to be the annotation keyphrases to the image.

Tactic Integration

Tactic ingegration use each cue to select keyphrases orderly. We generally apply TAG to narrow the keyphrases range down, then we apply TF-IDF and SR to filter in candidate set. Figure. 1 is the flow chart of multi-cues tactic integration.

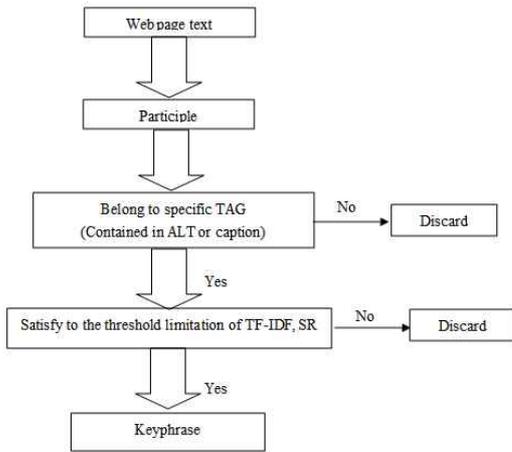


Figure. 1. Multi-cues tactic intergration flow chart

TF-IDF threshold limitation can select threshold according to experiments, or simply order the tokens and take the first few ones as keyphrases.

III. Experiment

The multi-cues integration based automatic image annotation algorithm was then tested on four web images corpora from online image search engines - Baidu, Google, MSN Live, Yahoo. These corpora were chosen because a sufficient number of documents in each site contained annotated keyphrases in the form of the Meta Keyword HTML tags and were therefore suitable for empirical tests on the accuracy of automatic keyphrase extraction. The structure is described in Figure. 1 below.

IV. Conclusion

In this paper, we first introduce the traditional WWW image annotation methods, based on low level features, page tags, overall word frequency and local word frequency. Then we put forward our method of multi-cues integration image annotation.

참고문헌

- [1] Ritendra Datta, Dhiraj Joshi, Jia Li and James Z. Wang, "Image Retrieval: Ideas, Influences, and Trends of the New Age," ACM Computing Surveys, vol. 40, No. 2, pp. 1-77, 2008.
- [2] J.Cox, et al. "PicHunter: Bayesian relevance feedback for image retrieval [C]," Proceedings of 13th International Conference On Pattern Recognition, Vienna, pp. 361-369, 1996.
- [3] Y. Rui, T. S. Huang, S. F. Chang, "Image Retrieval: Current Technologies," Promising Directions and Open Issues [J]. Journal of Visual Communication and Image Representation, 10(4), pp. 39-62, 1999.
- [4] Theo Gevers and Arnold Smeulders, "Pictoseek: Combining color and shape invariant features for image retrieval," IEEE Transactions on image Processing, 9(1):102-119, January 2000.

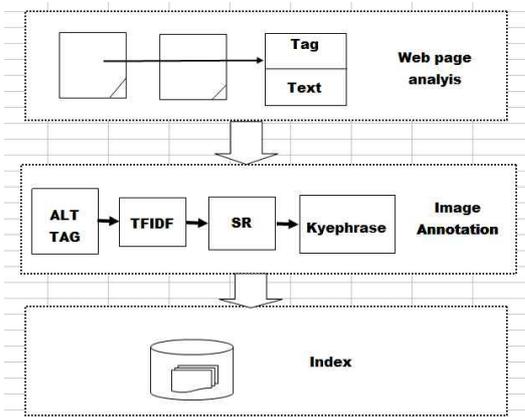


Figure.2, Index Module