

Experiments for the ImageCLEF 2007 Photographic Retrieval Task

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Abstract

This article describes the configuration of the experiments that we submitted for the *ImageCLEF Photographic Retrieval Task*. We used a redesigned version of our last years retrieval system prototype (see [1] for details). The translation of the topics for our cross-lingual experiments was realized with a plug-in to access the Google Translate [2] service. We used thesauri from OpenOffice [3] to expand the queries for better retrieval performance. This year, we submitted 11 runs, whereof only one was completely automatic. In all our experiments mixed modality was applied, i.e. we used text retrieval and content-based image retrieval for re-ranking. The evaluation results show that most of our experiments achieved very strong retrieval performance.

Categories and Subject Descriptors

H.3 [Information Storage and Retrieval]: H.3.1 Content Analysis and Indexing; H.3.3 Information Search and Retrieval

Keywords

Evaluation, Cross-Language Information Retrieval, Content-based Image Retrieval, Query Expansion, Experimentation

1 Introduction and outline

This year, we used a redesigned version of our retrieval prototype from 2006 to participate in the *ImageCLEF Photographic Retrieval Task*. The general description of the task is given in [4]. To overcome the challenging task thesauri were used for query expansion. We hoped to balance the reduced amount of textual annotations with this approach. Our experiments were based on text retrieval and were optimized with content-based image retrieval.

The outline of the paper is as follows. Section 2 describes the general setup of our system. The individual configurations of our submitted experiments are shown in section 3. In sections 4 and 5 we summarize the results and sum up our observations.

2 Experimental setup

The approach we used for the *ImageCLEF Photographic Retrieval Task* is as follows. We decided to use an automatic query expansion approach to balance the reduced amount of textual annotations in the data

collection. We used thesauri from OpenOffice [3] by applying a threshold technique to obtain a number of terms for each query. The baseline of all our experiments was a classic text retrieval run. In a second step the results of the text retrieval were re-ranked based on image content descriptors. We applied the MPEG-7 descriptors EdgeHistogram and ScalableColor from the Caliph and Emir project [5] that were calculated from the example image of each topic. Finally, we used a manual feedback strategy to enhance retrieval performance in all our setups except the baseline run. The feedback strategy was to assess a certain number of the top documents and to apply a feedback algorithm that uses the annotations from the relevant documents.

3 Configuration of submitted runs

The detailed setup of our experiments are presented in the following subsections.

3.1 Monolingual

We submitted 5 monolingual experiments in total, whereof one was the completely automatic baseline run (first row in table 1).

Table 1: Configuration of monolingual experiments

<i>identifier</i>	<i>language</i>	<i># images for FB</i>
cut-EN2EN	EN	0
cut-EN2EN-F20	EN	20
cut-EN2EN-F50	EN	50
cut-ES2ES	ES	20
cut-DE2DE	DE	20

3.2 Cross-lingual

We also submitted cross-language experiments for all target collections. The translation was realized with a plug-in that is capable to access the Google Translate [2] service. We also used the thesauri based query expansion approach that was mentioned before. Table 2 shows the setup of the individual cross-language runs.

Table 2: Configuration of cross-lingual experiments

<i>identifier</i>	<i>query language</i>	<i>target language</i>	<i># images for FB</i>
cut-EN2ES-F20	English	Spanish	20
cut-ZHS2EN-F20	Chinese, simplified	English	20
cut-DE2EN-F20	German	English	20
cut-IT2EN-F20	Italian	English	20
cut-FR2EN-F20	French	English	20
cut-FR2DE-F20	French	German	20

4 Results

The results of our submitted runs are summarized in table 3. It can be seen that our monolingual english experiment performed best. Furthermore, one can observe that monolingual retrieval performance for english and spanish annotations is very good, while monolingual retrieval on german annotations is quite bad in comparison. Another interesting observation is the result for the cross-lingual experiment with english topics on spanish annotations, which performs better than all cross-lingual runs on the english annotations.

Table 3: Results for submitted experiments

<i>identifier</i>	<i>MAP</i>	<i>P20</i>	<i>Rank</i>
cut-EN2EN-F50	0.3175	0.4592	1
cut-EN2EN-F20	0.2846	0.4025	5
cut-ES2ES	0.2772	0.3708	12
cut-EN2ES-F20	0.2770	0.3767	13
cut-ZHS2EN-F20	0.2690	0.4042	19
cut-DE2EN-F20	0.2565	0.3650	22
cut-IT2EN-F20	0.2495	0.3633	28
cut-FR2EN-F20	0.2432	0.3583	31
cut-DE2DE	0.1991	0.2992	40
cut-FR2DE-F20	0.1640	0.2367	100
cut-EN2EN	0.1515	0.2383	142

5 Conclusion

Our experiments showed that the manual feedback strategy is a promising approach for this year's *ImageCLEF Photographic Retrieval Task*. But also the combination of text retrieval and well-known content-based image descriptors as well as the application of thesauri based query expansion in this domain - with a small amount of textual metadata - was important for good retrieval performance.

References

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