Improving Cross-lingual Search Quality

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Abstract
Advancements in Information Retrieval (IR), a field that has become drastically more important in the Information Age, focus primarily on increasing the speed and accuracy of search upon large collections of data. We present several methods for cross-lingual search in the Shoah Foundation Institute Visual History Archive. The nature of our project yielded itself to value the recall performance higher than the precision performance of a given method. Therefore, the majority of the developed techniques focus on obtaining relevant terms from a variety of sources on the web, and expanding our database of results.

Baseline Method

- Established after Schindler’s List.
- Stephen Spielberg was getting lots of phone calls.
- Over 52,000 interviews of survivors and witnesses of the Holocaust.
- Indexed by approximately 62,000 English keywords.
- Worldwide access for education.

Baseline Method Performance

Figure: Baseline method had a clear division between languages that returned successful results majority of the time, and languages that did not.

Known problems:
- Some languages had better stemming and analyzing support than others
- ‘Double translation’ through Google leads to more problem queries
- Language-specific implementation problems
- Difficult to set up for a website that requires quick results

SQT M Method

Figure: The next method was to directly translate the search query, and use English Lucene to search in the database.

Benefits of using SQTM:
- Only one machine translation is performed: this amounts to less possibility for error.
- SQTM more easily lends itself to various typical techniques that can be used to improve our results.
- Every language is passed through the same Lucene version (only English), which provides an easier way to implement the system.
- The number of languages is limited by the number of languages supported by Google translate or similar software, we are no longer concerned how many languages Lucene stemmers and analyzers can work with.

Possible Improvements

Figure: Improving SQTM results is difficult since neither precision nor recall is perfect. We need a method that would not increase recall at a big expense of precision.

Conclusions and Further Work

Our results clearly indicate that SQTM is the best method for solving the specific problem posed by the Shoah Foundation. To see the full strength of pivoting, filtering, and using other corpora, we need to obtain a more complete thesaurus of search terms. For example, one possible improvement to the thesaurus and hence to the search quality to use a wider range of transliterations of words.

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