

KB Video Retrieval at TRECVID 2009

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Abstract

This paper describes the KB Video Retrieval system for the TRECVID 2009 evaluation. Our research focus this year was on query expansion using external knowledge bases.

Index terms- knowledge base, query-by-example, query expansion, Wikipedia

1. Introduction

This paper describes the KB Video Retrieval system for the TRECVID 2009 evaluation (1). We participated in the fully automatic search task and submitted 5 runs.

Our research focus this year was on Query Expansion using external knowledge bases. The query expansion techniques were applied to both the text and image/video topic queries.

Our 5 submitted runs are described below:

- KBVR_1: This is a query expansion run consisting of 3 Wikipedia titles and 5 example image queries.
- KBVR_2: This is a query expansion run consisting of 10 Wikipedia titles and 10 example image queries.
- KBVR_3: This is a query expansion run consisting of 20 Wikipedia titles and 0 example image queries (text only query).
- KBVR_4: This is a query expansion run consisting of 5 example image queries (image only query).

- KBVR_5: This is a query expansion run consisting of 3 Wikipedia titles and 7 example image queries.

2. KB Video System Overview

The KB Video System looks at new ways to bridge the semantic gap by incorporating information from external knowledge bases. The focus this year is on expanding a user information request by supplementing the original query with related concepts found in Wikipedia (2). This encyclopedia includes over 2.7 million English articles and boasts over 75,000 active contributors.

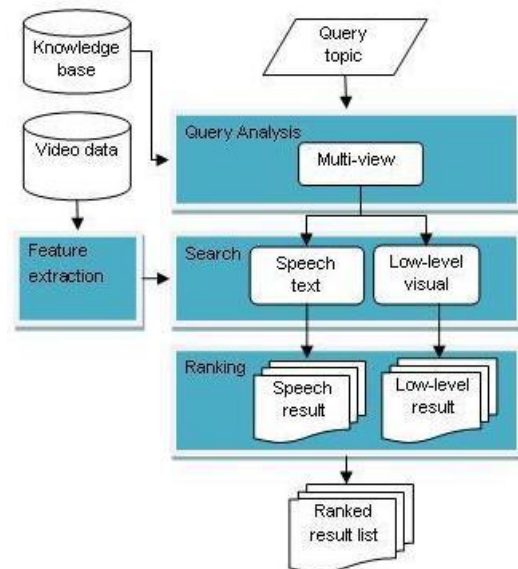


Figure 1 Multi-view system

Our knowledge base system is depicted in [Figure 1 Multi-view system]. The system uses the initial text topic query in a term vector

similarity search over a title-based index of the Wikipedia repository. The top N ranked titles, representing concepts related to our query, are selected as additional text queries. Each of these concepts is then used in a term vector similarity search of the test set ASR data (3). The ASR data is indexed using a 3-shot sliding window.

The Wikipedia concept set is next used to derive a visual query set. Each of the related concepts is submitted to the Google (4) image search engine and the top M image results are downloaded and included as part of the visual example query. Our visual features are based on the edge histogram (5) and extracted from each example query. The individual image feature vectors are clustered into K clusters (6) and used separately as query-by-example. The visual result sets, along with the Wikipedia concept query result sets, are fused to derive the final shot ranking.

3. Conclusions

Our research in video retrieval will continue to look at new ways to incorporate knowledge bases into the query and ranking process. We plan to expand our system to use better performing image features with a mixture of both semantic concepts and query-by-example. We also plan to focus significant research in the area of re-ranking algorithms for our multi-view features.

4. References

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