

Exploring Large-Scale News Video Databases via Visual Analysis

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Broadcast video news provides not only reports on events but insight into the social and political framework from which the broadcast originates. However, with the rapidly increasing number of broadcasts, the fraction that can be successfully watched in detail or even monitored by any individual or entity is growing ever smaller. This project resolves this problem by integrating achievements in semantic video analysis, knowledge discovery and visualization. By optimizing all sub systems toward a single target, the resulting solution significantly improves overall performance and also provides important new capabilities for large-scale news video exploration, comparative analysis, and discovery.

To achieve semantic video understanding, we have developed a principal shot-based video content representation framework and multi-class EM algorithm for semantic video classification. Based on our semantic video understanding framework and a full multimedia analysis approach that merges video, audio, and closed captions (where available), we have developed novel knowledge modeling via semantics and interesting knowledge extraction via a provider behavior model that can be applied to automatically identify and extract news stories from a video stream in any language. The knowledge extraction algorithm is able to extract interesting knowledge and suppress uninteresting knowledge. Finally, visualization techniques are used to represent the knowledge and visual semantics and provide an interactive exploration approach. An online demo can be found at <http://cs.uncc.edu/~jfan/NewsRelation/demo.htm>. We have more than 20 research publications for this project. Most recent ones are listed at the end of this abstract.

In the future, feature selection will be integrated in the multi-class EM algorithm to improve the performance of semantic video understanding. A better knowledge extraction algorithm will be implemented by integrating the provider behavior model with a user behavior model. A seamless hierarchical browsing visualization interface will be used to enable users to explore the database with different level of details and over any time range.

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