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Multilingual Informedia
Search & summarization of video on demand from English & foreign media sources

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Project Title: **Multilingual Informedia: Search & Summarization on Demand from English Language and Foreign Media Sources**

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Sponsor: Defense Advanced Research Project Agency (DARPA) , and SPAWAR (Space Warfare Systems) NRaD (Naval Research and Development)

Project Description

This project began in 1997 and was completed in July 2000. The purpose of the Multilingu
project was to develop automated systems and tools enabling multilingual and multimedia info
capture, search, retrieval, summarization and reuse. The system, built on the underlying Inforn
Video Library system concepts, technology and infrastructure, is designed to access textual, a
and video (TV) information, to index, categorize, retrieve, summarize and analyze it, in one or
languages. We focused primarily on the Serbo-Croatian language to demonstrate viability and
of proposed concepts. We implemented and demonstrated a prototype system that was a mul
browser of text, video and radio material that accepts English queries and returns the most rel
Croatian, and English language reports or segments in their original language, in full or summ
example, this enables the analyst to compare divergent American and foreign reporting of the
or topic. The semantic-expansion translation that we use reconstructs all consistent meanings
and phrases in the English query, resulting in an expanded target language query without loss
but at some cost in precision. We also built and delivered a functional broadcast news-focused
multiple, network-connected, offsite locations including DARPA and NSA.

Project Goals

- Robust full-content indexing, search and retrieval of text, audio and video documents, connected speech recognition and new statistical natural language processing techniq
- Multilingual document access via queries in English or the target languages. English q matched by semantic-expansion translation into each target language (German, Serbc and as an option other languages of the coalition forces including French, Italian, Spar Japanese and Korean). Semantic-expansion is a new information-preserving query tra mehod at CMU.
- On-demand summarization of individual document, or production of synthetic summari combining information from multiple documents focusing on maximally query-relevant and reducing cross-document redundancy, using novel methods for attaining summary sub-document information metrics, and zome-in/zoom-out variable grain-size summari
- Video segmentation, indexing and summarization into meaningful and indexable segm comprehensive fast-skim summaries; tools for extraction, annotation and reuse of desi content.
- New statistical-learning methods for rapid training of indexing/search, categorization ar summarization for new document collections and new languages.

Project Background

From its inception in 1995, the Informedia project's goal has been to allow search and retrieva
medium, similar to what is available today for text only. To enable this access to video content
recognition is used to provide a text transcript for the audio track; and image processing deteri
boundaries, recognizes faces and allows for image similarity comparison. Everything is indexe
searchable digital video library, where users can ask queries and receive relevant news storie:
The Multilingual Informedia Project pursues a seamless extension of the Informedia approach

and discovery across video documents in multiple languages. Previously, we successfully den
that current speech recognizers allow accurate information retrieval for automatically processe
news TV broadcasts. The multilingual system should perform speech recognition on foreign la
news broadcasts, segment it into stories and index the foreign data together with existing Eng
data. This first multilingual prototype should easily be extensible to other languages. There are
components to the Multilingual Informedia system that differ significantly from the original Infor
system:

- The speech recognizer recognizes a foreign language, specifically Serbo-Croatian.
- A keyword-based translation module transforms English queries into Serbo-Croatian, a
  search for equivalent words in a joint corpus of English and Serbo-Croatian news broa
- English topic labels for the foreign language news stories allow a user to identify a rele
  the target language.

We built upon an existing technological base at Carnegie Mellon, integrating several previousl
areas of investigation, including speaker-independent, connected speech recognition; text-retr
demand summarization; machine translation; image processing; automatic capture and digital
of multimedia information (text, audio, and video); and intelligent aids to the creation and reuse
multimedia information.

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