IDEA GROUP PUBLISHING



701 E. Chocolate Avenue, Hershey PA 17033-1117, USA Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com ITB7306

roup Inc. **Chapter V** News On Den Mark T. Maybury The MITRE Corporation, USA

Recently scientists have been focusing on a new class of application that promises ondemand access to multimedia information such as radio and broadcast news. This chapter describes how the synergy of speech, language and image processing has enabled a new class of information on demand news systems. We will describe the ability to automatically process broadcast video 7x24 and serve this to the general public in individually tailored personalcasts. We describe several systems and identify some remaining challenging research areas.

MULTIMEDIA INFORMATION ON DEMAND on demand, the ability to provide information tailored to specific and new capabilities for recent

Information on demand, the ability to provide information tailored to specific user needs, promises new capabilities for research, education and training, and electronic commerce (e.g., on-line information access, question answering and customer service). Whereas significant commercial activity has focused on providing access to documents, Web pages and structured data sources, less attention has been given to multimedia information on demand. To achieve effective multimedia information on demand, however, requires a confluence of capabilities from several fields including image, speech and language processing, information retrieval, information extraction, translation, summarization and presentation design.

Over the past several years, scientists have been exploring a range of systems to provide tailored, content-based access to multimedia including text, imagery, audio and video (Maybury, 1993). We describe two systems to illustrate this new functionality: BBN's Rough 'n Ready and MITRE's Broadcast News Navigator (BNN).

ROUGH 'N READY

BBN's Rough 'n Ready (Kubala et al., 2000) uses a 60,000-word automatic speech transcription system to enable real-time monitoring of broadcast news with approximately This chapter appears in the book, Multimedia Networking: Technology, Management and Applications by Syed Mahbubur Rahman.

Copyright © 2002, Idea Group Publishing.

18.8% word error rates for broadcast news sources. As Figure 1 illustrates, Rough 'n Ready provides a "rough" translation of content that is "ready" for browsing. The left-most column in Figure 1 illustrates the system's ability to detect a particular speaker (e.g., Elizabeth Vargas) or at least a speaker change and their gender. The center column shows the transcribed words, with color highlighting of named entities (people, locations, organizations) detected by natural language processing. Finally, using topic detection and tracking software, the third column lists keywords indicative of the subject of the associated text segment. Using the system, a user can either browse or search news for relevant stories. Topic Detection and Tracking (TDT) has become a common task with progress measured by community-based evaluation across different tools (Allan et al., 1998; Wayne, 1998).

BROADCAST NEWS NAVIGATOR (BNN)

MITRE's Broadcast News Navigator (BNN) (Maybury et al., 1997) goes beyond spoken language processing and synergistically combines techniques for processing speech, language and imagery, providing more sophisticated presentation of and access to news. The Web-based BNN gives the user the ability to browse, query (using free text or named entities) and view stories or their multimedia summaries. For example, Figure 2 displays all stories about Princess Diana on CNN Prime News during August-September 1997. For each story, the user is given the ability to view its closed-caption text, named entities (i.e., people, places, organizations, time, money), a generated multimedia summary or view the full original video of a story. The user can also graph trends of named entities in the news for given sources and time periods. For example, Figure 3 graphs the onset and abatement of stories on Princess Diana and Mother Teresa, September 8-15, 1997.

Analyzing audio, video and text streams from digitized video, BNN segments stories extracts named entities, summarizes stories and designs presentations to provide the end user with content-based, personalized Web access to the news (Maybury et al., 1997). For example, within the video stream color histograms are used to classify frames and detect scene changes. In the audio stream, algorithms detect silence, speaker changes and transcribe

Norld #	ans traught \$1/31/11 V ? # ? 26 -56 9 9 1	Rough's Ready
lorsule 1	It's a strategy to pressure on second making deals and it's known each day in Southern California latest danger from hell.	Parage relations with the United States
nale 2	From ABC news World headquarters in New York january thirty Instances ninety this is world news tonight saturday here's Classified Vergen.	hespachers Melled Halians Ing
Eksabork Vorgio	Good evening and detense secretary When Cohen said today had a military shite against a rock would be gode robstantial in size and impact but Cohen sheared that the white would not be able to remove Sadden Hussein teen power or eliminate his deadly arsenal the detense secretary also had strong words today for the United Nations Security Council ASC's John Mewelly reports.	Pelites and government
nalų 4	With more american Impower being considered for the Pensian Guil delense secretary <u>Cohen</u> today insued by are the administration's loughest offician of the UN security council without mentioning Pausia or China buying named <u>Cohen</u> took dead aim at their relationce to get leugh with hosp.	
autor 1	Frankly I find II incredibly hard to accept the proposition but in the face of <u>Soldary's</u> actions and that of members of the <u>Security</u> <u>Council</u> cannot bring themselves to to clear that this is a fundamental or material breach of old conduct on his part I think is challenges the credibling of <u>Security Council</u> .	

Figure 1: BBN's Rough 'n Ready ABC World News Tonight, January 31, 1998

6 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igiglobal.com/chapter/news-demand/27029

Related Content

Making Enterprise Recorded Meetings Easy to Discover and Share

Shimei Pan, Mercan Topkara, Jeff Boston, Steve Woodand Jennifer Lai (2015). International Journal of Multimedia Data Engineering and Management (pp. 19-36). www.irma-international.org/article/making-enterprise-recorded-meetings-easy-to-discover-andshare/130337

Effective Knowledge Development in Game-Based Learning Environments: Considering Research in Cognitive Processes and Simulation Design

Amy B. Adcock, Ginger S. Watson, Gary R. Morrisonand Lee A. Belfore (2011). *Gaming and Simulations: Concepts, Methodologies, Tools and Applications (pp. 409-425).*

www.irma-international.org/chapter/effective-knowledge-development-game-based/49396

Adaptive Image Steganography Based on Structural Similarity Metric

Guangjie Liu, Shiguo Lian, Yuewei Daiand Zhiquan Wang (2009). *Handbook of Research on Secure Multimedia Distribution (pp. 454-471).*

www.irma-international.org/chapter/adaptive-image-steganography-based-structural/21327

Ethical Reasoning and Reflection as Supported by Single-Player Videogames

Jose P. Zagal (2011). Designing Games for Ethics: Models, Techniques and Frameworks (pp. 19-35).

www.irma-international.org/chapter/ethical-reasoning-reflection-supported-single/50729

Image Quality Improvement Using Shift Variant and Shift Invariant Based Wavelet Transform Methods: A Novel Approach

Sugandha Agarwal, O. P. Singh, Deepak Nagaria, Anil Kumar Tiwariand Shikha Singh (2017). *International Journal of Multimedia Data Engineering and Management* (pp. 42-54).

www.irma-international.org/article/image-quality-improvement-using-shift-variant-and-shiftinvariant-based-wavelet-transform-methods/182650