

# CUNEYT M. TASKIRAN

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## OBJECTIVE

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Create new TV and mobile applications that people want using my media analysis and machine learning expertise

## EDUCATION

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**Ph.D., Electrical and Computer Engineering**, Purdue University, West Lafayette, IN, 2004

**M.A., Linguistics**, Purdue University, West Lafayette, IN, 2006

**M.S., Electrical Engineering**, Bogazici University, Istanbul, Turkey, 1993

**B.S., Electrical Engineering**, Bogazici University, Istanbul, Turkey, 1990

## PROFESSIONAL EXPERIENCE

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**Senior Research Staff, Motorola Applications Research Center, Schaumburg, IL, August 2004 to date**

- *Seamless Content Consumption*: Created an approach based on collections of links to media content, called Media Bundles (MBs), that (i) unify content consumption experience across content sources, modalities, and devices; (ii) provide a personalized and story-based experience, e.g. follow a story through a combination of web pages, TV programs, podcasts; (iii) enable synchronized presentation of content using TVs and mobile devices; (iv) help push long tail content and targeted ads.
- *News association for automatic MB creation*: Designed and implemented a news digest system that tracks Web news stories, associates them with TV news stories using closed-caption text analysis and dynamically builds MBs for developing news stories.
- *Venue and event based mobile applications*: Initiated a project to provide an immersive game day experience for stadium audiences by pushing MBs containing additional event information, as well as ads and coupons, to user phones and also to set-top-boxes in private rooms; this system is currently in early trials in a stadium with a capacity of 115,000 people.
- *RDF Schema design*: Co-designed a schema to describe media associations based on RDF Schema and Atom for efficient transmission and processing of MBs by various consumer devices.
- *Video analysis*: Developed and applied methods for video analysis, including robust shot boundary detection, fast copy clip detection, and news story segmentation; created results for Motorola Labs' entry in TRECVID 2005 Video Retrieval Evaluation.

**Ph.D. Research, School of Electrical and Computer Engineering, Purdue University**

**Dissertation title:** *Video Processing and Analysis for Content-Based Retrieval Applications*

- *Video program summarization*: Created a video summarization system based on speech recognition text; designed and conducted a large scale user study to measure summary effectiveness.
- *Video program structure modeling*: Formulated a new hybrid approach to program modeling that combines HMMs and probabilistic context-free grammars for program genre classification, which has a superior performance to both.
- *Video indexing tools for C-SPAN Archives*: Developed and implemented tools based on unique speaker identification, these are still being used by personnel at the Archives; created a system for automatic generation of closed captions using speech recognition.

**M.A. Research, Interdepartmental Program in Linguistics, Purdue University**

**Thesis title:** *Stylometric Text Analysis for Authorship Attribution and Text Categorization*

- *Authorship attribution*: Developed a graph-based approach using dependency graphs of sentences to identify differences in literary styles among authors.
- *Natural language steganalysis*: Applied SVM classifiers based on output of language models to detect manipulations in text caused by lexical steganography methods.

### **IBM Almaden Research Center, Almaden, CA, Research Intern, summer 2000**

- Created a video summarization system and integrated it into IBM's *CueVideo* system

### **Sharp Labs of America, Camas, WA, Research Intern, summer 1999**

- Developed text categorization and automatic query expansion algorithms to automatically fetch business news from the Internet according to user interest profiles; work resulted in a patent

### **Purdue University, West Lafayette, IN, Instructor, fall 2002 and summer 2004**

- Taught undergraduate courses in Signal Processing and Probability

## **PROGRAMMING EXPERIENCE**

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**Languages:** C/C++, Perl, Java, and Ruby

**Platforms:** Unix, Windows, EZX Linux (Motorola A780, e680i phones), OpenCable Application Platform (set-top-box application development), and Windows Mobile

**Toolkits, Frameworks, and others:** Tk, Rails, and MATLAB

## **PATTERN RECOGNITION EXPERTISE AREAS**

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**Classifier theory and design:** SVMs, tree classifiers, classifier fusion, boosting, hierarchical clustering

**Parameter estimation:** EM Algorithm and its variants, the Baum-Welch and the Inside-Outside algorithms

**Computational NLP:** Word collocation analysis,  $n$ -gram models, and probabilistic context-free grammars

## **SELECTED PUBLICATIONS** (a complete list of my publications can be found at [www.ctaskiran.com](http://www.ctaskiran.com))

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C. Taskiran, A. Amir, D. Ponceleon, Z. Pizlo, and E. Delp, "Automated Video Program Summarization Using Speech Transcripts," *IEEE Transactions on Multimedia*, vol. 8, no. 4, pp. 775-791, August 2006.

G. Abdollahian, C. Taskiran, Z. Pizlo, and E. Delp, "Motion Driven Content Analysis of User Generated Video," submitted to *IEEE Transactions on Multimedia*.

**(invited paper)** C. Taskiran, D. Li, W. Wang, and Bhavan Gandhi, "Seamless Content Consumption across Media Delivery Channels and Devices Using Media Bundles," *Proceedings of the Society of Cable Telecommunications Engineers Conference on Emerging Technologies*, January 23–25 2007, Houston, TX.

**(invited paper)** C. Taskiran and F. Bentley, "Video summary evaluation and visualization," *Proceedings of the SPIE Conference on Multimedia Content Access: Algorithms and Systems*, 31 January–1 February, 2007, San Jose, CA.

A. Mariappan, E. Delp, C. Taskiran, and B. Gandhi, "A Study of Low-Complexity Tools for Semantic Classification of Mobile Images and Video," *Proceedings of the SPIE Conference on Multimedia on Mobile Devices II*, 15–19 January 2006, San Jose, CA.

C. Taskiran, U. Topkara, M. Topkara, E. Delp, "Attacks on linguistic steganography systems using text analysis," *Proceedings of the SPIE Conference on Security, Steganography, and Watermarking of Multimedia Contents VIII*, 16–19 January 2006, San Jose, CA.

D. Li, C. Taskiran, N. Dimitrova, W. Wang, and B. Gandhi, "Cross-Modal Analysis of Audio-Visual Programs for Speaker Detection," *Proceedings of the IEEE International Workshop on Multimedia Signal Processing (MMSP)*, October 30–November 2 2005, Shanghai, China.

C. Taskiran, J. Chen, A. Albiol, L. Torres, C. Bouman, and E. Delp, "ViBE: A Compressed Video Database Structured for Active Browsing and Search," *IEEE Transactions on Multimedia*, vol. 6, no. 1, pp. 103-118, February 2004

C. Taskiran, I. Pollak, C. Bouman and E. Delp, "Stochastic Models of Video Structure for Program Genre Detection," *Proceedings of the International Conference on Visual Content Processing and Representation (VLBV'03)*, September 18–19 2003, Madrid, Spain.

## PATENTS

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- B. Gandhi, C. Taskiran, C. Metcalf, and K. J. O'Connell, "Method for Intelligently Creating, Consuming, and Sharing Video Content on Mobile Devices," filed in 2007
- R. Li, C. Taskiran, and M. Danielsen, "Method and apparatus for head animation control using block motion data," filed in 2007
- D. Li, W. Wang, C. Taskiran, and B. Gandhi, "Apparatus and Method of Consuming Associated Media Across Devices," filed in 2006
- *U.S. Patent number 6477524*, C. Taskiran and R. Qian, "Method for Statistical Text Analysis," issued in 2002

## PROFESSIONAL ACTIVITIES

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- Invited to chair a special session on "Natural Language Watermarking" in *SPIE Conference on Security, Steganography, and Watermarking of Multimedia Contents Conference* in January, San Jose, CA, 2006
- Reviewer for various technical conferences and journals including *IEEE Transactions on Multimedia*, *IEEE Transactions on Circuits and Systems for Video Technology*, and *Signal Processing*
- Member of IEEE and Society of Cable Telecommunications Engineers

## HONORS AND AWARDS

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- Numerous Motorola Labs awards for excellence in research, the Media Bundle Project was selected as the Most Innovative Project in 2005
- Was a finalist and placed 5th out of 58 teams in the 2003 Burton D. Morgan Entrepreneurship Competition with a business plan for automatic generation on closed captions for television programs
- Selected to be a member of Eta Kappa Nu, the National Electrical Engineering Honor Society

## PERSONAL

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- **Interests:** Ancient Greek, playing Go, language games, European cinema
- Trying to shoot a short movie based on a script I wrote