Special Topics in Spoken Language Processing

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Course Contents

- In this course, we will extensively survey and discuss all topics related to recent advances in spoken language processing, organization and its applications. Topics including,

  - Keyword Spotting and Large vocabulary continuous speech recognition: robust feature extraction, acoustic modeling, language modeling and search algorithms

  - Speech information retrieval: audio indexing, retrieval modeling, summarization and organization techniques

  - Speech translation: translation modeling, parallel corpus analysis, lexicon design

  - Machine learning: support vector machine, maximum entropy, conditional random fields, etc.

Textbooks

- Textbooks:
  - W. Chou,. B.H. Juang. Pattern Recognition in Speech and Language Processing. CRC Press. (February 26, 2003)
  - X. Huang, A. Acero, H. Hon. Spoken Language Processing: A Guide to Theory, Algorithm and System Development. Prentice Hall. (April 25, 2001)
  - W. B. Croft and J. Lafferty (Editors). Language Modeling for Information Retrieval. Kluwer-Academic Publishers. (July 2003)

References

- Journals
  - IEEE Transactions on Speech and Audio Processing
  - Computer Speech and Language
  - ACM Transactions on Asian Language Information Processing
  - ACM Transactions on Speech and Language Processing
  - …

- Conferences
  - IEEE Int. Conf. Acoustics, Speech, Signal processing (ICASSP)
  - Int. Conf. on Spoken Language Processing (ICSLP)
  - European Conference on Speech Communication and Technology (Eurospeech)
  - ACM Annual International Conference on Research and Development in Information Retrieval (SIGIR)
  - ACM Conference on Information Knowledge Management (CIKM)
  - …

Tentative Schedule

Topic List and Schedule (Subject to Change)

2/26	Course Overview Keyword Spotting and Utterance Verification	**HW1:** Keyword Spotting and Utterance Verification
3/04	Large Vocabulary Continuous Speech Recognition (LVCSR) using Tree-Copy Search (1/2)	
3/11	Large Vocabulary Continuous Speech Recognition (LVCSR) using Tree-Copy Search (2/2)	**HW2:** Tree-Copy Search
3/18	Machine Learning: Maximum Entropy (ME)	
3/25	Machine Learning: Conditional Random Fields (CRF)	
4/01	**Break (ICASSP 2008)**	
4/08	Machine Learning: Support Vector Machine (SVM)	
4/15	Robustness Techniques for Speech Recognition	
4/23	ICASSP2008 Paper Survey (1/2)	
4/30	ICASSP2008 Paper Survey (2/2)	
5/06	Robust Indexing and Retrieval of Spoken Documents	
5/13	Discriminative Acoustic Modeling	
5/20	Machine Translation	
5/27	Speaker Identification and Verification	
6/03	Language Model Adaptation	