Digital Speech Processing, Final

Jun. 20, 2012, 10:00-12:00

- OPEN Course PowerPoint, Course Reference, Personal Notes
- You have to use CHINESE sentences to answer all of the problems
- Total point: 120

1) (20) Explain the three key elements in a spoken dialogue system: what they are, how they operate, and how they are linked together.
2) (20) What is Maximum Likelihood Linear Regression (MLLR) approach for speaker adaptation? Why the acoustic models for phonemes not observed in the adaptation data can also be adapted?
3) (20) Explain and discuss why words, subword units and keywords are useful in voice-based information retrieval for Mandarin Chinese, but each with respective limitations?
4) (20)
   (a) What is the mismatch in acoustic environment between training/testing conditions for speech recognition?
   (b) Explain what the model-based approaches, feature-based approaches and speech enhancement are, including mentioning the names of two examples for each of them.
5) (20) In vector space model of information retrieval.
   (a) Explain how the vector representations of query q and document d can be constructed for each type of indexing feature?
   (b) What are the Term Frequency (TF) and Inverse Document Frequency (IDF) and what they mean?
   (c) How the relevance score can be computed using these vectors?
6) (20) Write down the two steps in each iteration of EM algorithm and explain how they operate and what they mean.