Introduction to Digital Speech Processing, Final Exam

Jun. 21, 2017, 10:00-12:00

- OPEN Lecture Power Point (Printed Version) and Personal Notes

- You have to use CHINESE sentences to answer all the questions, but you can use English terminologies

- Total points: 150

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1. (15) Explain what is a Long Short-term Memory (LSTM) cell and how it works.

2. (10) Explain the two steps in an Expectation and Maximization (EM) iteration.

3. (15) Explain the three key elements in a spoken dialogue system: what they are, how they operate, and how they are linked together.

4. (15) Explain how and why Maximum Margin Relevance(MMR) is used in summarizing a spoken or text document. Use an example to describe it.

5. What is Weighted Finite State Transducer (WFST?)? (10) How is it useful in speech recognition? (10)

6. Explain in retrieving speech information, why lattices are useful, and if they introduce extra problems? (10) Why subword units are useful? (5)

7. (10) What is Principal Component Analysis (PCA)?

8. What is speaker adaptation? (5)? What is Maximum Likelihood Linear Regression (MLLR) for speaker adaptation (10)?

9. (15) What is matrix factorization (MF) ? Show how it works in a recommendation system.

10. (10) What histogram equalization and how does it work?

11. (10) What is Pseudo-relevance Feedback (PRF)? How is it useful in retrieving speech information?