

Introduction to Digital Speech Processing, Final Exam

Jan. 14, 2015, 10:10-12:10

- 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: 120
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1. (10) Explain how and why Maximum Margin Relevance(MMR) is used in summarizing a document. Use an example to describe it.
2. (10) Explain what is the difference between Cepstral Mean Variance Normalization (CMVN) and Histogram Equalization (HEQ) in robust speech recognition.
3. (10) In text/speech-based information retrieval, we usually use recall rate and precision rate to evaluate our results. What are recall rate and precision rate respectively?
4. (20)
 - (a) (10) Describe what is Maximum Likelihood Linear Regression(MLLR)?
 - (b) (10) Describe how eigenvoices can be obtained from PCA?
5. (20)
 - (a) (10) Describe the mathematical framework of a Markov Decision Process(MDP)?
 - (b) (10) Describe how MDP can help in Multi-model Interactive Dialogue?
6. (10) Write down the two steps in each iteration of EM algorithm and explain how they operate and what they mean.
7. (20)
 - (a) (10) What is a Deep Neural Network (DNN)? How can it be used in acoustic modeling?
 - (b) (10) Explain how a Recurrent Neural Network (RNN) can be used in language modeling.
8. (10) Explain what is Support Vector Machine(SVM).
9. (10) Explain what is the Gradient Descent Algorithm.