

Example questions from the lecture with exemplary answers. No guarantee for correct answers.

1 Multi Modality

1. What does the term “modality” describe?
2. Name the three main modalities and describe them briefly.
3. What is a mode?
4. What is multi modality?
5. What is a multimedia system?
6. Why is multimodality important?
7. Difference between multimedia and multimodal system?
8. What is multimodal interaction?
9. Name 2 modalities of speech recognition (except speech) and explain them shortly.
10. What is a gesture?
 - (a) Are gestures part of speech?/ Why are gestures part of speech?
11. Give an example for a multimodal system.
12. What is AV-ASR?
13. Draw the typical architecture for audio-visual speech recognition.
 - (a) Describe the components of AV-ASR
14. Why do we need AV-ASR?
15. Describe the constraints of AV-ASR
16. Explain visemes.
17. Explain phonemes.
18. What are visual features?
19. Name challenges of the visual part.
20. Multi-modal fusion →HINT: Difference & Definition of early and late fusion is often answered wrong
 - (a) Name fusion strategies
 - (b) Where can it happen?
 - (c) How to find weights?
21. Explain Electro-myography
 - (a) Reasons for electro-myography
 - (b) Problems with electro-myography

2 Machine Learning

1. What is machine learning?
2. What do we do with it? / What is it good for?
3. How to implement it compared to classical software engineering?
4. Explain the difference between machine learning and AI.
5. Explain the principle of feature extraction
 - (a) Name and explain different forms of learning
6. How is speech recognition performed in a machine learning context?
7. Describe the Perceptrons principle
 - (a) Cell description
 - (b) Why do we use non-linear function?
 - (c) How is learning performed in a perceptron network?
 - (d) What does the error function describe?
 - (e) Explain the local minimum problem. Name a method to solve this problem.
 - (f) What is a multilayer perceptron?

3 Speech recognition

1. Describe the Acoustic Model
2. Describe the Language Model
3. Fundamental equation of ASR
4. Explain the advantages of mapping
5. How are speech recognition systems trained and tested?
6. Name an evaluation measure and describe its advantages and disadvantages
7. Describe the basic principle of speech production
8. What is hearing?
9. Describe the difference between Hidden Markov Model and Markov Model
10. What are the knowledge sources (models) of speech recognition? Name 4 variabilities in human speech recognition!