
Lecture Speech Recognition

Excercise 1

Introduction

1. Name some examples for the use of speech recognition systems.
2. What are the differences of applications, and what requirements are there for different conditions?
3. Sketch the typical block architecture of a statistical speech recognition system. Explain the different elements.

Probabilities

1. What is the probability of head (H) or number (Z) at the toss of a coin?
2. The coin is flipped three times in a row. What is the probability of (KKK) and (ZKZ)?
3. The coin is tossed three times again. What is the probability that twice (K) and one times (Z) will be thrown?
4. Again, three flips. The first toss is now showing (K). What is the probability of total twice (K) and one-times (Z)?

Sampling, Windowing, DFT

A speech signal $x(t)$ is band-limited with a upper cut-off frequency $f_c = 6kHz$.

1. Which Samplingfrequency f_s has to be used, that a reconstruction is possible?
2. Which resolution is achieved while sampling with f_a und $2f_a$ in the time-domain?
3. Sketch the spectrum of the sampled signals using f_a , $2f_a$ and $\frac{1}{2}f_a$ as sampling frequencies.
4. Which frequency-resolution is achieved when sampling the signal with f_a using a DFT with the length of $N=512$?