Audio- / Videosignalverarbeitung
Digital Signal Processing 2

Seminar 5

WS 2014/2015

Seminar Plan for January (1/2)

- Seminar 5
  - Presentation of homework 4
  - 06.01, 07.01, 15.01
- Seminar 6
  - Presentation of homework 5
  - 20.01, 21.01, 29.01

Seminar Plan for January (2/2)

Last week of the semester (2.02-6.02)

- Seminar on the 2.02
  - Questions, homeworks to show
- Seminar on the 3.02
  - Question and Answer session
    - Lecture material
    - Solution of quizz tasks
    - ADSP additional task

Homework (1/3)

1. Hilbert transform

We would like to determine the instantaneous amplitude of a speech signal.

- read in a speech signal (use the one from Homework 3 or 4)
- attenuate its negative frequencies using a Hilbert transformer with an impulse response length of 40 samples
- plot the resulting spectrum on the whole axis (from 0 to 2pi). How much are the negative frequencies attenuated?

Homework (2/3)

1. **Hilbert transform (cont.)**

- using this analytic signal, compute its instantaneous magnitude
- plot the original speech signal and its instantaneous amplitude in one time plot.

Homework (3/3)

2. Wiener Filter

We would like to reduce the noise in a speech signal.

- read in a speech signal
- add uniform white noise with amplitude of 5% of the max. amplitude of the speech signal
- compute the resulting Signal to Noise Ratio (SNR) in dB
- compute a Wiener filter with 14 coefficients
- plot the resulting magnitude response
- filter the noisy signal with the Wiener Filter
- compute the resulting SNR in dB