Audio- / Videosignalverarbeitung
Advanced Digital Signal Processing
Digital Signal Processing 2

Seminar 4

WS 2019/2020

Homework assignment (1/2)

1. Upsample the speech signal by the factor of N = 4, using **polyphase decomposition (Noble Identities)**
   - Use the same .wav file as in the Homework 3
   - Compare with Homework 3

2. Design filter for the anti-alias-filtering (as in HW 3)
   - FIR with 32 filter coefficients
   - Use: Parks-McClellan-Algorithm (remez filter design function)
   - Plot impulse and frequency response of the filter

Homework assignment (2/2)

- Reasonable filter design, i.e. consider:
  - passband, stopband, transition band
  - stopband attenuation
  - weights
  - normalization of frequency
  - stopband should start where aliasing components appear

3. Plot FFT of the Upsampled signal without filtering
4. Plot FFT of the Upsampled signal with filtering
5. Play back the resulting signal