Basics of video technology

(Schuller Applied Media Systems / Prof.)

seminar 4

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tasks

Sub-sampling, filtering

1. Expand the program from task 3 of the previous assignment as follows:
   i. Generate and plot a 2D FFT of the original image ("circles.jpg") and one of the analyzed images. What can you see?
   ii. Generating a simple 2-dimensional rectangular filter (mask), which retains the ¼ lowest frequencies. (See lecture)
   iii. Turning the filter to the Fourier-transformed original image at. What happens to the image in the local area (plot)?
   iv. Now run again by the sub-sampling. Are differences from the subsampling without filtering recognizable?

   - Draw the original, sub-sampled, filtered in the frequency domain, filtered and sub-images to compare them

2. Filter in the local area
   i. How can you avoid the transformation into the frequency domain while filtering the original image?
   ii. Implement the same filter in the spatial domain and run the same steps as in task 1 by.

tasks

Subsampling, filtering

1. Extend the program from task 3 of the previous homework as follows:
   I. Create and plot a 2D FFT of the original image ("circles.jpg") and down-sampled one. What can you see?
   II. Create a simple two-dimensional rectangle filter (mask) did keeps the lowest frequencies at ¼ (See lecture)
   III. Apply the filter to the fouriertransformed original image. What happens to the plot image?
   IV. Now do the downsampling again. Are there any differences to the downsampled version without filtering?
   V. Draw the original, subsampled, filtered with low pass filter, filtered and down-sampled images to compare them.
2. Filtering in the local area
   I. How can you bypass the transformation into the frequency domain and still filter the original image?
   II. Implement the same filter in the Time Domain and perform the same steps as in task first