

Konstanz, 20.03.2019

Assignment 4

„Multimedia“

Deadline 01.07.2019, F033.

Description of assignment

In this assignment the transformations of jpg-coding will be used. First the images need to be decomposed into blocks of 8x8 pixels. This yields 64 values, which are transformed using the discrete cosine transform (DCT). The resulting values are divided element-wise by the quantization matrix, rounded, and stored. For the decoding the rounded values are multiplied by the quantization matrix and undergo the inverse DCT.

If the quantization matrix is chosen appropriately the distortions in high-resolution images are hardly recognizable. For low resolutions the boundaries of the 8x8 pixel blocks can be seen.

For the solution you can use the following templates:

1. `run_jpg.m`: Template for the use of the transformations.
2. `jpeg_encode.m`: Template for the jpg encoder.
3. `jpeg_decode.m`: Template for the jpg decoder.
4. `*.jpg`: Image files.

Hints:

- <http://www-home.htwg-konstanz.de/~umlauf/Skript/Matlab.en.pdf>
- To read image files use the command `imread`.
- For gray-scale images the pixel values have to be converted from `uint8` to `Double`.
- Images can be displayed using the `image` and `imagesc` commands.

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