

Media Technology

Prof. Dr.-Ing. Andreas Schrader
January 28th, 2004

Assignment 3

Please process the following tasks. Each course participant should provide an own solution (copies will not be graded). The results have to be delivered in either handwritten or printed form to my inbox in the secretary office.
No Email attachment accepted.

Deadline: Wednesday, February 11th, 2004.

Task 3.1 (JPEG Image Compression)

Use any of your favorite image processing tools (e.g. PhotoEd, Photoshop, Corel Draw, etc.) to store a picture of your choice using the JPEG-format (*.jpg). Try to reduce the image quality in such a way, that the tiling (blocking) effect becomes visible.

- (a) Show the original and the compressed image (include them in your document) such that the blocks are easily to identify (maybe show a zoomed detail).
- (b) Explain the reason for this blocking effect.
- (c) For some of the blocks, try to find the corresponding 2D-DCT base pattern (slide 357) as done on slide 371.
- (d) Determine the compression ratio for your example image.

Task 3.2 (Video Compression)

- (a) Explain in your own words the concept of I, P, B, and D frames.
- (b) B frames have the smallest amount of resulting data. Why isn't it a good idea to use only one I frame each at the start and the end of a video and use only B frames between them for the whole movie?
- (c) Explain why the frames in a GOP are not transmitted in the same order they have to be presented at the receiver display. Why do we need a minimum of 3 frames at the receiver of a compressed video file using I, P, and B frames?

Task 3.3 (Video Compression)

Explain in your own words, why in typical head-and-shoulder scenes, a larger compression ratio can be achieved than in sports movies, even if the same compression technology is used.