

Digital Image Processing - Digitální zpracování obrazu (33DZO, E33DZO)

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<http://cmp.felk.cvut.cz/cmp/courses/dzo/dzo.pdf>

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1 Annotation.

The course covers core areas of digital image processing, including image formation, acquisition, pre-processing, compression, edge-detection, detection of geometric features and segmentation. Methods commonly used in machine vision and medical image applications are presented.

2 Lectures

1. Image Formation, Radiometry. Sensors. Digitization.

Chapter 3 from Forsyths book:

http://woska.felk.cvut.cz/Forsyth_CV_Book/radiometry.pdf

2. Colour. Reflectance models.

Chapter 5 from Forsyths book:

http://woska.felk.cvut.cz/Forsyth_CV_Book/colour.pdf

3. Imaging Geometry. Projective Transformation.

Zisserman's tutorial; easy to read:

http://cmp.felk.cvut.cz/cmp/courses/dzo/resources/tutorial_geometry_zisserman/epsrsc_ssaz.html

Chapter 2 from Forsyths book:

http://woska.felk.cvut.cz/Forsyth_CV_Book/cameras.pdf

Triggs and Mohr; if you want to know everything :-)

http://cmp.felk.cvut.cz/cmp/courses/dzo/resources/tutorial_geometry_mohr-triggs.ps.gz

4. Texture

R. Šara's lecture notes:

http://cmp.felk.cvut.cz/cmp/courses/dzo/resources/lecture_texture_sara.pdf

5. Compression

Chapter 27 of Smith's book on DSP

http://cmp.felk.cvut.cz/cmp/courses/dzo/resources/book_dsp_smith/datacomp.htm

5.1. Compression properties: lossy and lossless , progressive .

5.2. Entropy coding. The Huffman coder.

5.3. Predictive coding. Run-length coding.

5.4. Lempel-Ziv-Welsh LZW coding.

5.5. Transform coding. JPEG.

6. Edge Detection.

6.1.

7. Detection of geometric primitives. Hough Transform

7.1.

8. Corner Detection.

9. The Correspondence Problem

10. Segmentation

11. Mathematical Morphology

Literature: [1] Sonka, Milan; Hlavac, Vaclav; Boyle, Roger: Image Processing, Analysis and Machine Vision