

## ELE510 Image processing and computer vision, fall 2023

### Lecture Schedule – tentative

Week	Litteratur	Theme	Lab topic	Other info
34	1., 2.1, 2.2, 2.3, 2.4, + 9.1 3.1, 3.2	<ul style="list-style-type: none"> <li>- History, overview</li> <li>- Image Basics</li> <li>- Vision in nature</li> <li>- Image formation</li> <li>- Image acquisition</li> <li>- Modalities, Color</li> <li>- Simple geometric transformation</li> <li>- Gray level Transformation</li> </ul>	Pre-lab Friday 25.08	Pre-lab setting up the environment
35	3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.1	<ul style="list-style-type: none"> <li>- <b>Histograms</b></li> <li>- Multispectral transformation</li> <li>- Change detection</li> <li>- Compositing</li> <li>- Interpolation</li> <li>- Warping</li> <li>- Morphological operations</li> </ul>	Lab 1: <i>Fundamentals</i>	
36	5.1, 5.2, 5.3, 5.4	<ul style="list-style-type: none"> <li>- Spatial Domain Filtering,</li> <li>- Convolution</li> <li>- Smoothing, Gaussian kernel</li> <li>- 1st, 2nd derivative kernels</li> </ul>	Lab 2: <i>Image formation</i>	Deadline Lab 1: 08.09
37	5.5, 6.1, 6.2	<ul style="list-style-type: none"> <li>- Nonlinear filters</li> <li>- Image transformation, SVD</li> <li>- Fourier transform</li> </ul>	Lab 3: <i>Histogram and point transformations</i>	Deadline Lab 2: 15.09
38	6.3, 6.4, 6.5,	<ul style="list-style-type: none"> <li>- Frequency Domain Processing</li> <li>- Discrete fourier transform</li> <li>- 2D DFT</li> <li>- Freq.domain filtering</li> </ul>	Lab 4: <i>Spatial-domain filtering</i>	Deadline Lab 3: 22.09
39	7.1, 7.2, 7.3, 7.4, 7.5, 13.4	<ul style="list-style-type: none"> <li>- Edges and features</li> <li>- Gauss/laplace pyramids</li> <li>- Edge detector</li> <li>- Feature detect. (Harris, SIFT)</li> <li>- Feature descriptors</li> <li>- Projective geometry</li> </ul>	Lab 5: <i>Frequency-domain processing</i>	Deadline Lab 4: 29.09
40	13.5, 13.1, 13.2	<ul style="list-style-type: none"> <li>- Camera calibration</li> <li>- Human stereopsis</li> <li>- Correspondence problem</li> </ul>	Lab 6: <i>Image feature detection</i>	Deadline Lab 5: 06.10
41	13.3, 13.6	<ul style="list-style-type: none"> <li>- Motion and optical flow</li> <li>- Geometry of multiple views</li> </ul>	Lab 7: <i>Stereo Vision and Camera Calibration</i>	Deadline Lab 6: 13.10
42	10.1, 10.3	<ul style="list-style-type: none"> <li>- Thresholding</li> <li>- Image Segmentation</li> </ul>	Lab 8 <i>segmentation</i>	Deadline Lab 7: 20.10
43	12.4.6, 12.4.10 ++	<ul style="list-style-type: none"> <li>- Deep learning in Image processing (some topics)</li> </ul>	Finish lab 7/8	Deadline Lab 8: 27.10  Project titles published Friday 27 <sup>nd</sup> Oct.

44		<b>Project – no lecture</b>  I will be in class Monday if anyone needs start-help on project. No lectures - Unless possible delays and catching up.		Work on project!	
45		<b>Project – no lecture</b> (Unless possible delays and catching up)		Work on project!	Project delivery Friday 10.11 (Sunday 12.11)
46		- Summary - Previous exams - Q&A	<b>mandatory oral presentation of projects Monday 13.11 in lecture + lab-slot. Friday ( lecture + lab slot) for summary and questions.</b>		