Course code: MLC_CNIPA

This course is a follow-up of Convolutional Networks and Image Processing in which we will focus on image data preprocessing and advanced techniques of deep learning for image processing. Apart from image classification, well known from the previous course, we will study image segmentation, object detection, and especially advanced applications of generative adversarial networks (GANs) such as superresolution, noise reduction and generating deep fakes

Required skills
- basic knowledge of programing in Python
- high school level of mathematics
- Basics of machine learning on the level of our course Introduction to machine Learning
- Knowledge on the level of our basic Convolutional Networks and Image Processing

Course outline
- Architectures of neural networks for image processing (convolution, deconvolution, pooling, residual)
- Big neural networks for image processing (VGG 16 and ResNet)
- Image Segmentation (U-net, Object detection)
- Practical example of image segmentation
- Generative Adversarial Networks
- Practical example of image generation
- Superresolution (Upsampling, practical example of using GANs for superresolution)
- Practical project on housing price prediction using the combination of tabular and image data

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