

# Convolutional Neural Networks and Image Processing

Course code: MLC\_CNIP

Our workshop is for people who are looking for hands-on experience with deep neural networks for image processing, but they didn't have any real opportunity to do so yet. Through experiments, we will explore how and why such models work, the intuition behind its functionality, and gradually, through simple examples, we will come to the models commonly used in industry. We will focus on possible use cases for neural net's internal semantic image representation and how to visualize neural net behavior in the most effective way.

## Who is the course for

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## Required skills

- basic knowledge of programming in Python
- high school level of mathematics
- Basics of machine learning on the level of our course Introduction to machine Learning

## Course outline

- VGG 16 and ResNet
- Transfer learning and fine-tuning
- Image classification
- Batch normalization and data augmentation
- U-net and Image segmentation
- GANs and superresolution
- Neural network explainability
- Adversarial patch

### GOPAS Praha

Kodaňská 1441/46  
101 00 Praha 10  
Tel.: +420 234 064 900-3  
[info@gopas.cz](mailto:info@gopas.cz)

### GOPAS Brno

Nové sady 996/25  
602 00 Brno  
Tel.: +420 542 422 111  
[info@gopas.cz](mailto:info@gopas.cz)

### GOPAS Bratislava

Dr. Vladimíra Clementisa 10  
Bratislava, 821 02  
Tel.: +421 248 282 701-2  
[info@gopas.sk](mailto:info@gopas.sk)



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