ITMO University

Deep Learning

Course Workload		Assessment form (examination/ graded test/ ungraded test)
ECTS	Hours	
3	108	Exam

The course covers both basic and state-of-the-art approaches to machine learning and neural networks. The course introduces students to classification, optimization, and neural networks. The differences between the neural network approach and the classical machine learning approach are discussed, fully connected neural networks, convolutional and recurrent architectures are covered, as well as practical aspects of learning: data augmentation, parameter tuning, dropout, and more. Labs will introduce students to classification, optimization, and neural networks. By the end of the course, students will have gained experience with machine learning algorithms and knowledge of deep learning principles that will allow them to develop their own intelligent systems.

Course structure:

1. Introduction to machine learning

1.1. Introduction to deep learning

2. The convolutional neural networks

2.1. The convolutional neural networks

3. Recurrent networks

3.1. Recurrent neural networks

4. Generative models

4.1. GAN's
4.2. Optimization approaches
4.3. Learning based on energy minimization
4.4. Challenges ahead