Neural Networks and Deep Learning: Part 2: Advanced Topics

The first lecture is scheduled on February 27, 2024 - 9:00
Visit the course web page for registration and connecting to the channel.
http://retis.sssup.it/~giorgio/courses/neural/nn.html

Giorgio Buttazzo

Objectives: This module presents recent techniques proposed to improve previous models and overcome their limitations. Topics include Deep Reinforcement Learning, semi-supervised learning, GANs, transformers, neural tracking, adversarial attacks and defense methods.

Course program

2. **Model compression.** How to distill knowledge and compress large DNNs to execute them in small-embedded platforms.
3. **Semi-supervised learning.** K nearest neighbors, Self training, Co-training, SSL by GANs, One-shot learning, Zero-shot learning.
6. **Generative adversarial networks.** Generative autoencoders, GANs, Style Transfer, Semi-Supervised learning. Diffusion models (DALL-E)
7. **Explainable AI.** Definition and taxonomy. Common approaches for image processing and tabular data.
8. **Natural Language processing.** Language model. Language translation. Attention mechanism and transformers.
9. **Attention for computer vision.** Attention-based CNNs. Visual Transformers.