

Title: Machine and Deep Learning

Descriptions:

Recently, thanks to the increasing amount of data digitally available, machine learning and deep learning have become an important field of computer science with several applications in different scientific areas such as computer vision, natural language processing, speech recognition, agriculture, environment, bioinformatics, medicine, and so on.

The course aims to present machine learning and deep learning techniques discussing in depth the main features and applicability criteria. In particular, students will acquire basic knowledge to solve machine and deep learning tasks through a proper formulation of the problem, a critical choice of the learning models and an experimental analysis of the obtained results.

The main topics covered in this course are:

- Introduction of machine and deep Learning
- Definition of different types of learning: supervised learning, unsupervised learning, self-supervised learning, reinforcement learning
- Machine and deep learning algorithms and models: Linear Regression, Logistic Regression, Neural Networks, Convolutional Neural Networks, Recurrent Neural Networks, K-Means, DSCAN
- Evaluation Metrics: Accuracy, Precision, Recall, F1-measure

The course includes several seminars so that students can acquire advanced knowledge on specific topics such as fuzzy models, manifold learning algorithm, reinforcement learning.

Duration of the course: Basic concepts (10h) and Seminars (14h)

Lectures: Giuseppe Serra, Ferdinando di Martino, Constantinos Siettos