



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Advanced Computational Techniques for Big Imaging and Signal Data

2223-1-F9102Q015

Aims

The aim of the course is to provide practical notions of deep learning through hands-on laboratories. In particular, the student will learn several frameworks related to deep learning that cover all the aspects from the design to the deployment of the neural system.

Contents

The course consists of a set of practical laboratories. The course aims to get in touch with the bleeding-edge technologies related to deep learning. Four main parts will be covered: the design, the training of the neural architecture, the parameter search, the distributed training and the deployment of the system. During the laboratory several case-studies will be analyzed.

Detailed program

- Hardware accelerators (CPU, GPU, FPGA and TPU).
- Machine learning frameworks: tensorflow, pytorch, Jax, etc..
- Hyper-optimization frameworks: hyperopt, optuna, ray, etc..
- Deployment of the system: Onnx
- Cloud infrastructure for software as a service SAAS: RESTful APIs, streamlit, etc..
- Analysis of signals and temporal sequences
- Analysis of big images for remote sensing
- Analysis of big images for health

- Explainability and interpretability: usecases

Prerequisites

Programming basics, machine learning basics, linear algebra

Teaching form

The course will be delivered through face-to-face lectures. Lectures will be recorded and uploaded to the course page for those who cannot attend but still want to take the course on a delayed basis. It is still highly recommended to attend the lectures.

Textbook and teaching resource

Slides and material will be published on the course page.

Semester

Second

Assessment method

Written test with open and closed questions on the main tematics relative to the course.

Office hours

After the lesson and on appointment. The meeting can be done online or in my office, room 1048 building U-14.

Sustainable Development Goals

QUALITY EDUCATION
