FACOLTÀ DI SCIENZE MATEMATICHE, FISICHE E NATURALI
DIPARTIMENTO DI MATEMATICA E FISICA "NICCOLÒ TARTAGLIA"
INTERNATIONAL DOCTORAL PROGRAM IN SCIENCE

Stochastic Deep Learning Models in Space and Time for Environmental Applications

12 hours Course

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Course Description

This course is intended to introduce graduate student to mathematical and computational foundations of deep neural networks. The students will learn what has made deep neural networks extremely successful over the past two decades and how to properly implement them in Python. There will be both lectures and in class code tutorial, and the main focus of the course will be on implementing neural networks on practical problems, with research applications in both engineering and science.
The course introduces the mathematical and computational background to use deep neural networks. The students will be introduced to Python and Google Colab, and neural networks will be presented as generalization of linear regression models. Fundamentals of parameter learning and image recognition will also be covered.

Course structure

Introduction to Python and Google Colab
Review on linear regression
Introduction to neural networks (NNs)
Learning networks: gradient descent and Backpropagation
Image recognition and convolutional NNs

Requirements

Notebook with Python and Google Colab installed and tested.

PhD Course

17, 18 and 19 June 2024
Aula 24, 10:30-12:30 and 13.30-15.30
Università Cattolica del Sacro Cuore
via Garzetta 48, Brescia

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