

Neural Networks

Academic Year: (2022 / 2023)

Review date: 02-06-2022

Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: MARTÍNEZ OLMOS, PABLO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

The students are expected to have basic knowledge of

- Calculus
- Programming skills
- Numerical optimization

OBJECTIVES

The fundamental objective is that the student learns to design decision machines based on neural networks for basic learning problems in tabular and multimedia data, paying special attention to regularization and validation techniques. Likewise, the student will learn to use automatic differentiation software packages for model training and experimental simulation.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Neural Networks and Backpropagation
2. Regularization and explainability
3. Architectures for high-dimensional correlated data: images, time series and graphs

LEARNING ACTIVITIES AND METHODOLOGY

Theoretical practical classes
 Laboratory practices
 Tutorials
 Team work
 Student individual work
 Partial and final exams

ASSESSMENT SYSTEM

The continuous evaluation will consist of partial exams, practicals and programming projects and presentation of works.

% end-of-term-examination:	0
% of continuous assessment (assignments, laboratory, practicals...):	100

BASIC BIBLIOGRAPHY

- Cristopher Bishop Pattern Recognition and Machine Learning, Springer , 2006
- Ian Goodfellow and Yoshua Bengio and Aaron Courville Deep Learning, MIT Press, 2017
- Kevin Murphy Machine Learning A Probabilistic Perspective, MIT Press, 2012