

Neural Networks

Academic Year: (2023 / 2024)

Review date: 31-05-2023

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

- AF1 Theoretical class
- AF2 Practical classes
- AF3 Theoretical and practical classes
- AF4 Laboratory practices
- AF5 Tutorials
- AF6 Group work
- AF7 Individual student work
- AF8 Partial and final exams

ASSESSMENT SYSTEM

The continuous evaluation will consist of partial exams, carrying out practices and programming projects and presentation of works.

SE 2 Individual or group work carried out during the course

The extraordinary evaluation will consist of a final exam.

SE 3 final exam

% 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

