62234 - Machine learning for Big Data

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	534 - Master's in IT Engineering
ECTS	3.0
Year	2
Semester	First semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as

- **Lectures.**
- **Talks from experts.**
- **Lab sessions**.

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- **Practice sessions**.
- **Tutorials**.
- **Autonomous work and study.**
- **Assignment.**
- **Assessment**. Oral presentation of the practical assignment.

5.2.Learning tasks

The course has 3 ECTS, that is equivalent to approximately 75 hours of student work (35 of lectures and practice sessions and 40 hours of autonomous work).

5.3.Syllabus

The course will address the following topics:

1. Introduction.
2. Deep Neural Networks.
3. Training of Deep Neural Networks. Backpropagation.
4. Deep Convolutional Networks.
5. Practical aspects of deep neural networks (Numerical gradient, overfitting, regularization, activation functions, stochastic gradient descent).
6. Application cases: Natural Language Processing and Visual Classification.
7. Hardware and software tools for deep learning.
8. Sequential Learning.
9. Approximate Nearest Neighbour.

5.4.Course planning and calendar

The course takes place in the Rio Ebro Campus. Sessions are organized in

- Lectures.
- Practice sessions.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website and course website.

5.5.Bibliography and recommended resources

- Bengio, Yoshua. Deep Learning / Yoshua Bengio, Ian Goodfellow and Aaron Courville. . . MIT Press (In preparation) [Comentario del profesor: preliminar versions of the chapers here http://www.deeplearningbook.org/] [Obs. docente: preliminar versions of the chapers here http://www.deeplearningbook.org/]
- Watt, Jeremy. Machine Learning Refined / Jeremy Watt, Reza Borhani, Aggelos Katsaggelos Cambridge University Press,2016
- preliminar versions of the chapers here (Yoshua Bengio, Ian Goodfellow and Aaron Courville. Deep Learning. MIT Press. In preparation)
- Yann LeCun, Yoshua Bengio and Geoffrey Hinton. Deep Learning. Nature 521, nº 7553 (2015): 436:444 (Visible para usuarios UNIZAR)