

Course guide

270737 - PPAI - Professional Practice in Artificial Intelligence

Last modified: 04/02/2025

Unit in charge:	Barcelona School of Informatics		
Teaching unit:	723 - CS - Department of Computer Science.		
Degree:	MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE (Syllabus 2017). (Optional subject).		
Academic year: 2024	ECTS Credits: 3.0	Languages: English	

LECTURER

Coordinating lecturer:	CLAUDIO ULISES CORTÉS GARCÍA
Others:	Primer quadrimestre: CLAUDIO ULISES CORTÉS GARCÍA - 10 Segon quadrimestre: CLAUDIO ULISES CORTÉS GARCÍA - 10

PRIOR SKILLS

We require the student to be knowledgeable on:

- * Processes for developing large and complex software systems
- * Roles and technologies to help you control such projects
- * Research-level issues in areas such as software engineering, information systems, simulation modelling, digital media and games, network computing and artificial intelligence.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

- CEP3. Capacity for applying Artificial Intelligence techniques in technological and industrial environments to improve quality and productivity.
- CEP4. Capability to design, write and report about computer science projects in the specific area of Artificial Intelligence.
- CEP5. Capability to design new tools and new techniques of Artificial Intelligence in professional practice.
- CEP7. Capability to respect the legal rules and deontology in professional practice.
- CEP8. Capability to respect the surrounding environment and design and develop sustainable intelligent systems.

Generical:

- CG1. Capability to plan, design and implement products, processes, services and facilities in all areas of Artificial Intelligence.

Transversal:

- CT1. ENTREPRENEURSHIP AND INNOVATION: Capability to know and understand a business organization and the science that defines its activity; capability to understand the labor rules and the relations between planning, industrial and commercial strategies, quality and profit.
- CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.
- CT6. REASONING: Capability to evaluate and analyze on a reasoned and critical way about situations, projects, proposals, reports and scientific-technical surveys. Capability to argue the reasons that explain or justify such situations, proposals, etc..

TEACHING METHODOLOGY

There it will be invited speakers from the industry --at least 4-- and up to 7 case studies of Artificial Intelligence Industrial applications.

The format will be a seminar with direct participation and reporting tasks.

LEARNING OBJECTIVES OF THE SUBJECT

- 1.To determine the AI-based technologies, tools, architectures, and algorithms that would be most suitable for Industrial applications.
- 2.To be able to develop a set of criteria for AI applications development, and evaluate each of the identified applications in terms of this criteria
- 3.To make short- and long-term ethical recommendations for the industrial AI applications development and work in a multidisciplinary team

STUDY LOAD

Type	Hours	Percentage
Self study	48,0	64.00
Hours large group	27,0	36.00

Total learning time: 75 h

CONTENTS

Industrial Applications of Artificial Intelligence

Description:

This part of seminar is a compendium of Artificial Intelligence applications naturally taking full advantage of the research potential of professors at Universitat de Barcelona, Universitat Politècnica de Catalunya and Universitat Rovira i Virgili and the experience of their members in numerous R&D projects undertaken in recent years.

Face to face with the Artificial Intelligence Industrial Applications

Description:

AI is being used extensively in the business world. Its applications cross a wide spectrum. For example, AI is being applied in management and administration, science, engineering, manufacturing, financial and legal areas, military and space endeavors, medicine, and diagnostics.

Senior managers in many companies use AI-based strategic planning systems to assist in functions like competitive analysis, technology deployment, and resource allocation. They also use programs to assist in equipment configuration design, product distribution, regulatory-compliance advisement, and personnel assessment. AI is contributing heavily to management's organization, planning, and controlling operations, and will continue to do so with more frequency as programs are refined. AI is also influential in science and engineering.

In this part of the seminar students will be face to face with successful industrials that have been using AI techniques in their businesses

Introduction

Description:

Methodological issues and discussion about the general calendar.

ACTIVITIES

Conferences with CEO's from AI industries

Description:

A cycle of conferences with CEOs will be organized so students get to know successful industrial histories that used Artificial Intelligence as their basis for success.

Specific objectives:

1, 2, 3

Related competencies :

CEP7. Capability to respect the legal rules and deontology in professional practice.

CEP4. Capability to design, write and report about computer science projects in the specific area of Artificial Intelligence.

CEP8. Capability to respect the surrounding environment and design and develop sustainable intelligent systems.

CEP3. Capacity for applying Artificial Intelligence techniques in technological and industrial environments to improve quality and productivity.

CEP5. Capability to design new tools and new techniques of Artificial Intelligence in professional practice.

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CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

CT6. REASONING: Capability to evaluate and analyze on a reasoned and critical way about situations, projects, proposals, reports and scientific-technical surveys. Capability to argue the reasons that explain or justify such situations, proposals, etc..

CT1. ENTREPRENEURSHIP AND INNOVATION: Capability to know and understand a business organization and the science that defines its activity; capability to understand the labor rules and the relations between planning, industrial and commercial strategies, quality and profit.

Full-or-part-time: 28h

Theory classes: 6h

Self study: 22h

Examples of Industrial Applications of Artificial Intelligence from R&D

Description:

The Artificial Intelligence applications developed for science and engineering are used to organize and manipulate the ever-increasing amounts of information available to scientists and engineers. The Artificial Intelligence is used in complex processes and it is the increased use of robotics in business.

In this part of the seminar we will study edge applications of Artificial Intelligence born as R&D results. Most of the examples will come from European Union funded research.

Specific objectives:

1, 2, 3

Related competencies :

CEP7. Capability to respect the legal rules and deontology in professional practice.

CEP4. Capability to design, write and report about computer science projects in the specific area of Artificial Intelligence.

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CT1. ENTREPRENEURSHIP AND INNOVATION: Capability to know and understand a business organization and the science that defines its activity; capability to understand the labor rules and the relations between planning, industrial and commercial strategies, quality and profit.

Full-or-part-time: 43h

Theory classes: 18h

Self study: 25h

Introduction

Description:

The student will learn the objectives of this seminar. He will receive the materials and learn the calendar of activities.

Full-or-part-time: 4h

Theory classes: 2h

Self study: 2h

GRADING SYSTEM

Participants will submit a couple of essays during the course. There will be a single grade for the essays and for the final exam. The final exam will count for 60% of the grade.

BIBLIOGRAPHY

Basic:

- Russell, S. Human compatible: artificial intelligence and the problem of control. [New York, New York?]: Viking, 2019. ISBN 9780525558613.
- Dignum, V. Responsible artificial intelligence: how to develop and use AI in a responsible way [on line]. Switzerland: Springer, 2019 [Consultation : 24/03/2025]. Available on : <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pg-origsite=primo&docID=5972861>. ISBN 9783030303716.
- Véliz, C. Privacy is power: why and how you should take back control of your data. Brooklyn ; London: Melville House, 2021. ISBN 9781612199153.
- Torras, C. The vestigial heart: a novel of the robot age. The MIT Press, 2018. ISBN 9780262037778.
- Nowotny, H. In AI We Trust: Power, Illusion and Control of Predictive Algorithms. Polity Press: Wiley, 2021. ISBN 9781509548811.
- Frankish, K.; Ramsey, W.M. (eds.). The Cambridge handbook of artificial intelligence. Cambridge, UK: Cambridge University Press, 2014. ISBN 9780521691918.

Complementary:

- Meieran, E. 21st Century Innovations [post] [on line]. National Academy of engineering, 2007 [Consultation: 04/03/2025]. Available on: <https://www.engineeringchallenges.org/cms/7126/8275.aspx>.
- Neufville, Richard de. Flexibility in engineering design. Cambridge, Mass. ; London: MIT Press, 2011. ISBN 9780262016230.
- Bilbeny, Norbert. Robótica, ética y política : el impacto de la superinteligencia en el mundo de las personas. Primera edición. Vilassar de Dalt, Barcelona: Icaria, diciembre de 2022. ISBN 9788418826757.
- Boukis, Christos; Pneumatikakis, Aristodemos; Polymenakos, Lazaros. Artificial intelligence and innovations 2007 : from theory to applications. New York: Springer, cop. 2007. ISBN 9780387741604.