Automated Planning

Academic Year: (2021 / 2022) **Review date: 14-07-2021**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: GARCIA OLAYA, ANGEL

Type: Electives ECTS Credits : 3.0

Year : 2 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

None

OBJECTIVES

- To present state-of-the-art automated planning techniques
- To characterize every technique as well as the domains they suit better
- To use tools that implement techniques discussed in class
- To identify different open issues for research in order to suggest new Master and PhD thesis

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
   1.1 Knowledge representation
   1.2 Heuristic Search
2. Classical planning
   2.1 State space. STRIPS
   2.2 Partial plans. UCPOP
3. Planning based on plan graphs
   3.1 Plan graphs. GRAPHPLAN
   3.2 SAT planning. SATPLAN
4. Heuristic planning
   4.1 Early approaches. HSP, FF
   4.2 New heuristics and planners. Fast downward, pattern data bases, landmarks, symbolic planning, portfolios
   4.3 Hierarchical Task Networks (HTN). SHOP2
5. Machine learning in planning
6. Other planning paradigms
   6.1 Temporal planning (scheduling)
   6.2 Partial Satisfaction Planning
   6.3 Planning under uncertainty

LEARNING ACTIVITIES AND METHODOLOGY

LEARNING ACTIVITIES

AF3: Theoretical-practical classes [23.33 hours, 100% face-to-face, 0.78 ECTS]
AF5 - Tutorials [8 hours, 25% face-to-face, 0.27 ECTS]
AF7 - Individual student work [55.67 hours, 0% face-to-face, 1.86 ECTS]
AF8 - Partial and final exams [3 hours, 100% face-to-face, 0.1 ECTS]

METHODOLOGY

MD1 - Class lectures by the professor with the support of computer and audiovisual media, in which the main concepts are developed and the bibliography is provided to complement the students' learning.
MD2 - Critical reading of texts recommended by the professor of the subject: press articles, reports, manuals and/or academic articles, either for later discussion in class, or to expand and consolidate the knowledge of the subject.
MD3 - Resolution of practical cases, problems, etc. .... posed by the teacher individually or in groups.
MD5 - Preparation of papers and reports individually or in groups.

ASSESSMENT SYSTEM

50% oral presentation of final project (equivalent to final exam)

50% homework

Extraordinary call: 100% project

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

BASIC BIBLIOGRAPHY

- James F. Allen, James Hendler y Austin Tate (eds.) Readings in planning, Morgan Kaufmann, 1990..
- Malik Ghallab, Dana Nau, Paolo Traverso Automated Task Planning. Theory & Practice, Morgan Kaufmann, 2004.
- Stuart Russell y Peter Norvig Artificial Intelligence: A modern approach, Prentice Hall, 2010

BASIC ELECTRONIC RESOURCES

- ICAPS council . ICAPS: https://www.icaps-conference.org/