Automatic Planning

Academic Year: (2023 / 2024) **Review date: 27-04-2023**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: GARCIA OLAYA, ANGEL

Type: Compulsory ECTS Credits : 3.0

Year : 1 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
   6.4 Timeline-based planning

LEARNING ACTIVITIES AND METHODOLOGY

Lectures
Weekly homework
Final project with oral presentation
Individual office hours

ASSESSMENT SYSTEM

% end-of-term-examination:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

50% oral presentation of final project (final exam)
50% sum of homework
Extraordinary evaluation: 100% project

% end-of-term-examination:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

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/