



Faculté des sciences appliquées

FSA

INGI2261 Intelligence artificielle : Représentation et raisonnements

[30h+30h exercices] 5 credits

This course is taught in the 1st semester

Teacher(s): Yves Deville (coord.), Pierre Dupont, Axel Van Lamsweerde
Language: french
Level: 2nd cycle course

Aims

- To understand and explain the basic knowledge representation, problem solving and reasoning methods in artificial intelligence
- To assess the applicability, strength, and weaknesses of the basic knowledge representation, problem solving and reasoning in solving particular engineering problems
- To develop intelligent systems by assembling solutions to concrete computational problems
- To understand the role of knowledge representation, problem solving and reasoning in intelligent-system engineering

Main themes

- Problem solving by searching : formulating problems, uninformed and informed search strategies, local search, evaluation of behavior and estimated cost, applications
- Constraint satisfaction : formulating problems as CSP, backtracking and constraint propagation, applications
- Games and adversarial search : minimax algorithm and Alpha-Beta pruning, applications
- Propositional logic : representing knowledge in PL, inference and reasoning, applications
- First-order logic : representing knowledge in FOL, inference and reasoning, forward and backward chaining, rule-based systems, applications
- Planning : languages of planning problems, search methods, planing graphs, hierarchical planning, extensions, applications
- AI, philosophy and ethics : can machines act intelligently, can machines really think, ethics and risks of AI, future of AI

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

- Prerequisites:

This course presupposes the knowledge of material covered in the two following courses

- (1) INGI2541 : Mathématiques discrètes : bases logiques de l'informatique
- (2) LINF2121 : Algorithmique et structures de données

- References

- (1) Stuart Russell and Peter Norvig "Artificial Intelligence: A Modern Approach", Second Edition, Prentice Hall, 2003
- (2) N. Nilsson "Artificial Intelligence: A New Synthesis" Morgan Kaufmann, 1998
- (3) E. Rich and K. Knight "Artificial Intelligence", 2nd edition, McGraw Hill Book Company, 1991
- (4) P.H. Winston "Artificial Intelligence", 3rd Edition, Addison-Wesley, 1998.
- (5) M.R. Genesereth and N. Nilsson "Logical Foundations of Artificial Intelligence" Morgan Kaufmann, 1987

Other credits in programs

ECGE3DS/IG	Diplôme d'études spécialisées en économie et gestion (informatique de gestion - Master in Information Systems)	(5 credits)	
FSA3DS/IN	Diplôme d'études spécialisées en sciences appliquées (informatique)	(5 credits)	
INFO22	Deuxième année du programme conduisant au grade d'ingénieur civil informaticien	(5 credits)	Mandatory
LINF22/GN	Deuxième licence en informatique (informatique générale)	(5 credits)	Mandatory
LINF22/GS	Deuxième licence en informatique (informatique de gestion)	(5 credits)	