INGI2365 constraint programming

[30h+15h exercises] 4 credits

This course is taught in the 2nd semester

Teacher(s): Yves Deville (coord.), Peter Van Roy
Language: French
Level: Second cycle

Aims

- To understand and apply techniques for solving Constraint Satisfaction Problems
- To solve simple problems involving CSP
- To understand and explain foundations of models and languages for constraint solving
- To identify problem classes where constraint programming can be apply successfully
- To model simple problems in the form of constraints, and express these models in a constraint programming language, including search strategies.

Main themes

- Constraints and domains
- Constraint Satisfaction Problems (CSP)
- Models and languages for constraint programming
- Methods and techniques for constraint solving (consistency, relaxation, optimization, search, linear programming, global constraints, ...)
- Search techniques and strategies
- Problem modelling and resolution
- Applications to differents problem classes (e.g. planification, scheduling, ressource allocation, economics, robotics)

Content and teaching methods

see "Main themes"

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

- Prerequisites
This course presupposes the knowledge of material covered in the following course
(1) INGI2261 : Artificial Intelligence : Representation & Reasonning
- References
(1) K. Apt. Principles of Constraint Programming. Cambridge University Press, 2003
(2) Rina Dechter. Constraint Processing. Morgan Kaufmann, 2004
(3) Kim Marriott, Peter J. Stuckey. Programming with Constraints. An Introduction.
(4) P. Van Hentenryck. The OPL Optimization Programming Language. The MIT Press, 1999.
(5) P. Van Hentenryck, L. Michel and Y. Deville. Numerica A Modeling Language for Global Optimization, The MIT Press, 1997.

Other credits in programs

FSA3DS/IN	Diplôme d'études spécialisées en sciences appliquées (informatique)	(4 credits)
INFO22	Deuxième année du programme conduisant au grade d'ingénieur civil informaticien	(4 credits)
INFO23	Troisième année du programme conduisant au grade d'ingénieur civil informaticien	(4 credits)
MAP23	Troisième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(4 credits)