COMP4418

Knowledge Representation and Reasoning

Lecturers:

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• Maurice Pagnucco (Lecturer-in-Charge; J17-501B; morri@cse.unsw.edu.au)

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Aim: Introduce

• Techniques used in KR to represent knowledge

• Associated methods of automated reasoning

Units of Credit: 6

Prerequisites: COMP3411 plus 6 Units of Credit in COMP3###

Course in AI plus some familiarity with

• LISP/PROLOG

• First-order logic
Knowledge Representation and Reasoning

Marking: 3 assignments of equal value (15%) and final exam work 55%.

No project but some programming

Text: References provided in class

Format:

- Lectures:
  - Mondays 12-2pm, Mathews Theatre B
  - Thursdays 2-4pm, Colombo Theatre A
- Consultations: as required

Course Structure:

- 3 weeks: Introduction to KRR.
- 3 weeks: Non-monotonic reasoning, reasoning about knowledge and reasoning about action.
- 3 weeks: Social choice, resource allocation and cooperative/non-cooperative game theory.
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Topics for KRR Part 1: Introduction:

– Introduction
– First-order logic
– Expressing knowledge
– Full Clausal logic
– Horn Clause logic
– Procedural representation
– Nonmonotonic reasoning and defaults

Topics for KRR Part 1: Potential Additional Topics:

– Production systems
– Description logics
– Frames
– Inheritance networks
– Probabilities
– Defaults
– Abductive explanation
– Action
– Planning
– Expressiveness/tractability
– Belief Change
– Cognitive Robotics