



EPISTEMIC REASONING IN AI

le 3 mai 2019

14h00

- Irista (Salle Métivier), Rennes

Soutenance d'habilitation à diriger des recherches de François Schwarzentruher, maître de conférences au département Informatique



ABSTRACT

Artificial agents take decisions according to their knowledge about the world and the knowledge they have about the knowledge of other agents: this is called higher-order knowledge. For instance, let us consider three autonomous robots on Mars called A, B, C. Agent A decides to explore the region to the North if “A knows that neither B nor C knows that there is sand to the North”. In my habilitation, we will present Dynamic Epistemic Logic which provides a framework to model such complex epistemic situations and the evolution in time of knowledge. The framework is sufficiently expressive to capture public actions (e.g. broadcast of a message) but also private and semi-private actions (e.g. private messages). The framework will be explained via a software, called Hintikka’s world. We will discuss about symbolic models, which allows to represent situations with a high number of possible worlds. We then address model checking and the satisfiability problem that are standard decision problems for verifying multi-agent systems. We address epistemic planning which is undecidable in general. We will pinpoint restrictions over actions (e.g. only public actions, etc.) for which epistemic planning is decidable. We will then discuss about applications: robots in a geometric environment, asynchronous systems.

THÉMATIQUE(S)

Recherche - Valorisation

Mise à jour le 8 avril 2020

À TÉLÉCHARGER

Habilitation thesis (PDF)

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JURY

Alexandru Baltag, Associate Professor at ILC, Universiteit van Amsterdam
Valentin Goranko, Professor at Stockholm University
Jérôme Lang (referee), CNRS researcher, LAMSADE, Université Paris-Dauphine
Sheila McIlraith (referee), University of Toronto
Yoram Moses (referee), professor at the Technion - Israel Institute of Technology
Sophie Pinchinat, professor at Université de Rennes 1