Temporal Planning under Uncertainty

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Many real-world planning problems -- for instance planning the operations of Mars rovers -- require reasoning about time, concurrent actions, and uncertainty, and would benefit from the production of plans with a degree of contingency. Unfortunately, research on planning under uncertainty has typically focused on timeless non-concurrent domains, and research on temporal planning has been confined to deterministic domains. In this talk, I will review a recent line of research on temporal planning under uncertainty. I will cover a range of methods that are being developed at NICTA and elsewhere, including extensions of Markov decision process planning to handle time and concurrency, extensions of temporal planning to handle uncertainty, and perhaps more originally, adaptations of model-free reinforcement learning methods to planning. This mix of approaches has the potential to handle a spectrum of applications with different requirements, e.g. discrete vs continuous time distributions, or optimal contingency planning vs compact approximate policy generation with low memory requirements.

Biography:

Sylvie Thiebaux is an associate professor at the Australian National University and a principal researcher with National ICT Australia. Prior to this, she graduated in 1995 with a PhD in computer science from the university of Rennes (France), and held research positions at INRIA and CSIRO. She is one of the co-chairs of the next ICAPS conference. Her research interests in artificial intelligence include planning, reasoning under uncertainty, model-based diagnosis, and search.