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Detection-averse optimal and receding-horizon control for Markov decision processes. (English) [Zbl 1453.93243](#)

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Summary: In this paper, we consider a Markov decision process (MDP) in which the ego agent intends to hide its state from detection by an adversary while pursuing a nominal objective. After formulating the detection-averse MDP problem, we first describe a value iteration (VI) approach to exactly solve it. To overcome the “curse of dimensionality” and thus gain scalability to larger-sized problems, we then propose a receding-horizon optimization (RHO) approach to compute approximate solutions. Numerical examples are reported to illustrate and compare the VI and RHO approaches, and show the potential of the proposed problem formulation for practical applications.

MSC:

[93E20](#) Optimal stochastic control

[90C40](#) Markov and semi-Markov decision processes

Keywords:

[stochastic control](#); [optimal control](#); [Markov decision processes](#); [system security](#); [data privacy](#)

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