

Scalable Reinforcement Learning for Engineering Applications

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Abstract: Explainability and generalizability are two key demands placed upon any method of Artificial Intelligence for success in the real-world. Furthermore, there is a growing demand for distributed intelligent systems that could coordinate decisions. Reinforcement learning is a branch of Artificial Intelligence with a goal to develop intelligent agents by utilizing trial-and-error techniques. This talk will focus on recent developments in reinforcement learning research that aim to address the challenges of explainability and generalizability by leveraging the advances in neuro-symbolic learning, deep learning and variational inference on probabilistic graphical models. Recent developments in multi-agent reinforcement learning and their engineering applications will also be introduced. Importantly, the talk will discuss various techniques such as curriculum learning, evolutionary methods, and hybrid simulation and data driven methods to scale reinforcement learning research towards application in safety-critical, data-constrained Engineering applications.