Learning to Behave by Reading

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Abstract

In this talk, I will address the problem of grounding linguistic analysis in control applications, such as game playing and robot navigation. We assume access to natural language documents that describe the desired behavior of a control algorithm (e.g., game strategy guides). Our goal is to demonstrate that knowledge automatically extracted from such documents can dramatically improve performance of the target application. First, I will present a reinforcement learning algorithm for learning to map natural language instructions to executable actions. This technique has enabled automation of tasks that until now have required human participation — for example, automatically configuring software by consulting how-to guides. Next, I will present a Monte-Carlo search algorithm for game playing that incorporates information from game strategy guides. In this framework, the task of text interpretation is formulated as a probabilistic model that is trained based on feedback from Monte-Carlo search. When applied to the Civilization strategy game, a language-empowered player outperforms its traditional counterpart by a significant margin.

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