Title

Bridging The Gap Between Autonomous Skill Learning And Task-Specific Planning

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Abstract

Skill acquisition and task specific planning are essential components of any robot system, yet they have long been studied in isolation. This, I contend, is due to the lack of a common representational framework. I present a holistic approach to planning robot behavior, using previously acquired skills to represent control knowledge (and objects) directly, and to use this background knowledge to build plans in the space of control actions.

Actions in this framework are closed-loop controllers constructed from combinations of sensors, effectors, and potential functions. I will show how robots can use reinforcement learning techniques to acquire sensorimotor programs. The agent then builds a functional model of its interactions with the world as distributions over the acquired skills. In addition, I present two planning algorithms that can reason about a task using the functional models. These algorithms are then applied to a variety of tasks such as object recognition and object manipulation to achieve its objective on two different robot platforms.

Recommended Citation

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