Abstract

Application of reinforcement learning methods in the development of dialogue strategies that support robust and efficient human–computer interaction using spoken language is a growing research area. In spoken dialogue system, Markov Decision Processes (MDPs) provide a formal framework for making dialogue management decisions for planning. This framework enables the system to learn the value of initiating an action from each possible state which in turn facilitates the maximization of the total reward. However, these MDP systems with large state-action spaces lead to intractable solution. The goal of this paper is, thus, to present a novel approximation method with sampling practice to compute an optimal solution to control dialogue strategy based on learning automata. Compared to other baseline reinforcement learning methods the proposed approach exhibits a better performance with regard to the learning speed, good exploration/exploitation in its update and robustness in the presence of uncertainty in the states obtained.
A Learning Automata based Solution for Optimizing Dialogue Strategy in Spoken Dialogue System

strategies. The Knowledge Engineering Review, vol. 21, no. 02, 97–126.
- Young, S. ATK: an application toolkit for HTK. Available:http://mi. eng. cam. ac. uk/research/dialogue/atk_home

**Index Terms**

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**Keywords**

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