

一种求解动态及不确定性优化问题的新方法

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摘 要： 动态和不确定性优化问题，是许多智能优化算法面临的巨大挑战.介绍了一种可求解这类问题的连续动作学习自动机（Continuous-Action Learning Automaton, CALA）.该自动机利用一个可变区间作为其动作集，并依照均匀分布方式产生输出动作.根据一个滑动窗口内的最佳的历史动作，对区间的两个端点进行更新.通过两个仿真实验，演示了该算法在时变的随机环境下的优异性能.相对于三种传统的 CALA 算法，新算法的学习精度、反应速度以及在最坏情况下的行为表现都非常出色.

关键词： 学习自动机；连续动作学习自动机；动态环境；不确定性环境；在线学习

A New Method for Solving Dynamic and

Uncertain Optimization Problems

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Abstract: Dynamic and uncertain optimization problems pose a serious challenge to many intelligent optimization algorithms. A continuous action learning automaton (CALA) is introduced that can solve such problems. The automaton uses a variable interval as its action set, and generates actions with uniform distribution over this interval. The endpoints of the interval are updated according to the best historical action within a sliding window. Simulation results are presented to show the performance of the automaton in two time-varying stochastic environments. It is shown that the new algorithm exceeds three of the traditional CALA algorithms in the accuracy of learning, the rapidity of response, and the behaviors in the worst case.

Key words: learning automata; continuous-action learning automata; dynamic environments; uncertain environments; on-line learning

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