短文

基于Q学习算法和BP神经网络的倒立摆控制

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摘要
Q学习是Watkins[1]提出的求解信息不完全马尔可夫决策问题的一种强化学习方法. 将Q学习算法和BP神经网络有效结合,实现了状态未离散化的倒立摆的无模型学习控制. 仿真表明:该方法不仅能成功解决确定和随机倒立摆模型的平衡控制,而且和Anderson[2] 的AHC(Adaptive Heuristic Critic)等方法相比,具有更好的学习效果.
关键词　　Q学习　BP网络　学习控制　倒立摆系统　高斯噪声
分类号

Learning to Control an Inverted Pendulum Using Q-Learning and Neural Networks

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Abstract
Q-learning is a reinforcement learning method to solve Markovian decision problems with incomplete information. This paper presents a novel method to control an inverted pendulum with unquantized states by using Q-learning and neural networks. Simulation results are included to show that the new method can not only balance the determined or stochastic inverted pendulums successfully but also lead to a better effect of learning when compared with Anderson's AHC method.
Key words　Q-Learning　BP neural network　learning control　inverted pendulum　Gaussian noise

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