

论文与报告

竞争式Takagi-Sugeno模糊再励学习

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摘要

针对连续空间的复杂学习任务,提出了一种竞争式Takagi-Sugeno模糊再励学习网络(CTSFRNL),该网络结构集成了Takagi-Sugeno模糊推理系统和基于动作的评价函数的再励学习方法.文中相应提出了两种学习算法,即竞争式Takagi-Sugeno模糊Q-学习算法和竞争式Takagi-Sugeno模糊优势学习算法,其把CTSFRNL训练成为一种所谓的Takagi-Sugeno模糊变结构控制器.以二级倒立摆控制系统为例,仿真研究表明所提出的学习算法在性能上优于其它的再励学习算法.

关键词 [再励学习](#) [函数逼近](#) [T-S模糊推理系统](#)

分类号 [TP18](#)

Competitive Takagi-Sugeno Fuzzy Reinforcement Learning

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Abstract

This paper proposes a competitive Takagi-Sugeno fuzzy reinforcement learning network (CTSFRNL) for solving complicated learning tasks of continuous domains. The proposed CTSFRNL is constructed by combining Takagi-Sugeno type fuzzy inference systems with action-value-based reinforcement learning methods. Two competitive learning algorithms are derived, including the competitive Takagi-Sugeno fuzzy Q-learning and the competitive Takagi-Sugeno fuzzy advantage learning. These learning methods lead to so called Takagi-Sugeno fuzzy variable structure controllers. Simulation experiments on the double inverted pendulum system demonstrate the superiority of these learning methods.

Key words [Reinforcement learning](#) [function approximation](#) [Takagi-Sugeno fuzzy inference systems](#)

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