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论文

通用硬件模糊控制器研究

徐德[①], 杨莹春[②]

[①]中国科学院自动化研究所,北京,100080;[②]浙江大学计算机科学系,杭州,310027

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摘要
提出了一种基于多值逻辑电路的模糊控制器硬件实现方案, 采用规则分时进行硬件模糊推理, 不同规则的推理结果合并后形成模糊输出, 经模糊判决后形成精确量输出。该方案的复杂性不受规则数量的影响, 执行速度不受语言变量维数的影响, 该方案通过改变存储器数据可以方便地调整隶属度函数和模糊控制规则, 克服了硬件模糊控制器灵活性差这一重大缺陷, 该方案便于以VLSI实现。

关键词 多值逻辑 特征展开近似推理 模糊控制器

分类号 TP872

On the hardware realization of general fuzzy controller

Xu De[①],Yang Yingchun[②]

[①]Institute of Automation Chinese Academy of Sciences Beijing 100080 China;

[②]Computer Science Department Zhejiang University Hangzhou 310027 China

Abstract
A new hardware realization methodology of fuzzy controller based on Multiple-Valued Logic (MVL) circuits is proposed. To the methodology, the hardware fuzzy inference process for different rule is executed in different time. The combination of the inference results of different rules makes fuzzy output, then it is changed to general output by defuzzification. According to this methodology, the complexity of the controller is free from the number of rules and the executive speed free from the dimension of fuzzy variables, furthermore, the choice of membership functions is free and the adjustment of fuzzy control rules is easy. The new methodology can be easily realized by using the very-large-scale-integration technique.

Key words MVL Approximate Reasoning Method of Characteristic Expansion （ARMCE） Fuzzy controller

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通讯作者

作者个人主页 徐德[①]; 杨莹春[②]