

技术及应用

离散混沌系统的自适应自由递阶变结构控制研究

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收稿日期 修回日期 网络版发布日期:

摘要 本文采用自适应自由递阶变结构控制的方法对离散混沌系统进行控制, 使输出达到设定的目标值。研究提出当接近超平面 $s(k) = 0$ 的小区域内时加入自适应控制律, 使控制器能随 $x(k)$ 与目标值之间的误差而改变, 自适应地缩小控制范围和控制强度, 避免了在接近超平面的较小区域内仍采用较大且固定的控制器进行跳跃的控制。采用这种方法能精确得到输出域内的任意目标值, 有效降低输出抖振, 提高控制精度, 并可在低能耗的条件下实现系统输出功率的灵活调整。

关键词 [离散混沌系统](#) [自适应自由递阶](#) [变结构控制](#)

分类号

Adaptive Freely Hierarchical Variable Structure Control of Discrete Chaotic System

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Abstract Discrete chaotic system was controlled to reach the given orbit x_r by using the adaptive freely hierarchical variable structure control scheme. The adaptive control scheme was used when hierarchical sliding mode was close to the hyperplane in a small scope. The control intensity and control scope would be changed adaptively with the variation of the error between $x(k)$ and x_r by using the adaptive scheme. The largescale control intensity was avoided in the small control scope by using this control scheme. Any orbit in the output scope could be obtained accurately by using this control scheme. The output's dithering was reduced effectively and the precision of controlling was enhanced by using this adaptive freely hierarchical variable structure control scheme.

Key words [discrete chaotic system](#) [adaptive freely hierarchical](#) [variable structure](#) [control](#)

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