自动化学报 (): ISSN: 0254-4156 CN: 11-2109/TP

[2007-0894]基于自回归小波神经网络的感应电动机滑模反推控制

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收稿日期 修回日期 网络版发布日期 2007-12-17 接受日期

摘要
为了提高感应电动机控制的鲁棒性, 提出了一种新颖的感应电动机解耦模型. 基于感应电动机的 解耦模型, 利用滑模控制和反推控制设计电动机的虚拟转矩和磁链电压控制器. 滑模开关增益的大小 是造成系统抖振的关键, 采用自回归小波神经网络(SRWNN)在线估计滑模开关增益的大小可以有效降低滑模控制造成的 抖振. 仿真结果表明基于SRWNN在线估计滑模开关增益的滑模反推控制方案可以有效提高 感应电动机控制的鲁棒性, 同时降低了滑模控制造成的抖振.

关键词 感应电动机,自回归小波神经网络,滑模控制,反推控制
分类号

Sliding Mode Backstepping Control of Induction Motor based on Self Recurrent Wavelet Neural Networks

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Abstract
A new decoupled induction motor model is introduced for enhancing the robustness of control.Sliding mode control and backstepping control is applied to virtual torque and flux linkage voltage controllers design based on induction motor decoupled model. The magnitude of sliding mode switching gain is the key reason causing system chattering. Self recurrent wavelet neural networks(SRWNN) is applied to estimate sliding mode switching gain on-line, which can reduce chattering caused by sliding mode control effectively. The results of simulation proves that the scheme of sliding mode backstepping control based on SRWNN on-line estimation of switching gain can enhance the robustness of induction motor control effectively，and reduces the chattering caused by sliding mode control.

Key words Induction motor self recurrent wavelet neural networks sliding mode control backstepping control
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