短文

# 基于支持向量机**α**阶逆系统方法的非线性内模控制

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摘要

为了提高传统逆系统方法的鲁棒性和抗干扰能力, 提出了基于支持向量机α阶逆系统方法的非线性内模控制新方法. 该方法利用支持向量机辨识非线性系统的α阶逆模型, 并将其串连在原系统之前得到复合的伪线性系统. 对求得的伪线性系统采用内模控制方法进行控制. 仿真结果证明了该方法的有效性. 理论分析和仿真结果均表明, 该方法不依赖于系统的模型, 且较一般的逆系统方法鲁棒稳定性好, 设计简单, 跟踪精度高, 是解决非线性系统控制的一种可行的理论方法.

关键词　　支持向量机　　非线性内模控制　　逆系统方法　　鲁棒稳定性

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# Nonlinear Internal Model Control Based on Support Vector Machine αth-order Inverse System Method

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**Abstract**

To improve the robustness and anti-interference of traditional inverse system methods, a new internal model control method based on support vector machine (SVM) αth-order inverse system method is proposed. The method cascades the αth-order inverse model approximated by support vector machine with the original system to get the composite pseudo-linear system. Then the internal model control method is introduced into the pseudo-linear system. The effectiveness of the method is validated through simulation. Both the theoretical analysis and the simulation results show that the combined method does not depend on the accurate mathematical model and has good robustness stability, design simplicity and high tracking accuracy. And this approach is one of the applicable methods for the control of nonlinear systems.

**Key words**　　Support vector machine　　nonlinear internal model control　　inverse system method　　robust stability

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