

短文

多自由度串联系统传递函数的辨识

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摘要

本文考虑多自由度串联振动系统传递函数的辨识问题. 分析表明, 从输入输出结构看这是一个多级闭环系统, 如用模态分析技术建模, 需解 $2n$ 阶状态方程的特征值问题, 随着 n 的增大, 计算量增大, 参数估计精度下降. 本文从系统辨识角度提出一种二阶振荡系统传递函数辨识方法, 分别处理各个自由度的传递函数辨识, 仿真计算结果表明该方法比模态分析法简便有效.

关键词 [非线性回归](#) [多自由度振动系统](#) [可辨识性](#) [ARMAX模型](#)

分类号

The Identification of Transfer Functions in Series Vibration System With Multiple Degrees of Freedom

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Abstract

In this paper, the problem of identifying transfer functions in the vibration system with multiple degrees of freedom is dealt with. According to its input-output structure, such system is a multiple crossed closed loop system. By mode analyzing technique, it is required to solve an eigenvalue problem on the state equation of the degree of $2n$. As n increases, the computational demand for mode analyzing technique will increase greatly and the accuracy of parameter estimation will decrease. A method which can unifiedly deal with every stage's identification for a second order vibration system, and identify all transfer functions in the system is presented. The simulation results show that the method is simpler and more convenient than the mode analyzing technique for this class of systems.

Key words [Nonlinear regression](#) [vibration systems with multiple degrees of freedom](#) [identifiability](#) [ARMAX models](#)

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