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论文

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基于Bang-Bang控制思想的迭代学习控制算法研究

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A Study on Iterative Learning Control Algorithms Based on Bang-Bang Control Theory

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摘要

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摘要 根据迭代学习控制基本原理,吸取了Bang-Bang控制的思想,提出了新的迭代学习控制算法。与常用的利用迭代误差或误差变化率进行控制率计算的算法相比,该算法只需根据迭代误差的符号即可计算控制率,不仅大大减小了计算工作量,而且增强了系统的抗干扰能力。给出了算法表达式和控制结构图,进行算法收敛性分析。仿真结果表明该算法的有效性和收敛性。

关键词: 迭代 学习控制 Bang-Bang控制

Abstract: According to the basic principle of iterative learning control, a new approach to iterative learning control algorithms is proposed, which is based on Bang-Bang control theory. This method is different from the methods commonly used in that the later ones depend on the iterative errors or differential coefficient of errors. Its control law has just relation to the sign of iterative errors, which not only reduces the calculation but also improves the anti-disturbance performance. The expressions and control structure of the new algorithms are given. Then the convergence is analyzed. Simulations illustrate the effectiveness and convergence of the new algorithms.

Keywords: iterative learning control Bang-Bang control

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