一类非线性系统的迭代学习控制

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摘要 讨论一类非线性系统的迭代学习控制, 系统的非线性动态对状态不快于多项式增长, 而量测方程含有噪声. 控制序列并非直接输给系统, 而是先经过死区、预载及饱和等非线性函数. 递推地给出了学习控制序列, 并证明它的有界性及最优跟踪性.

关键词 非线性系统, 迭代学习控制, 量测噪声, 死区, 预载, 饱和, 随机逼近.

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Iterative Learning Control for a Class of Nonlinear Systems

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Abstract The iterative learning control (ILC) is considered for a class of nonlinear systems, for which the dynamic nonlinearity grows up not faster than a polynomial as the state diverges and the observation equation is corrupted by noise. The control sequence cannot directly feed to the system but first has to pass through a nonlinear function such as the dead-zone, pre-load, and saturation etc. The iterative learning control sequence is recursively defined, and its boundedness and optimal tracking property are proved in the paper.

Key words Nonlinear system iterative learning control measurement noise dead-zone pre-load saturation stochastic approximation.

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