论文

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一类非线性系统的D型在线学习控制

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D TYPE ON LINE LEARNING CONTROL FOR A CLASS OF NONLINEAR SYSTEMS

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摘要 结合对初始状态的学习，给出了一类输出方程不含控制变量的时变非线性系统的 D 型在线学习控制算法及其收敛条件。其特点是将学习误差在线反馈，且迭代初始状态只需通过理想信号及系统的部分信息即可确定。最后，将所得结论应用于机器人系统，表明本文方法是有效的。

关键词： 非线性系统 学习控制 理想信号

Abstract：A D type iterative learning control for a class of time varying nonlinear system is studied. Then, a practical learning algorithm is given, and a sufficient condition is presented to guarantee the system output converges precisely to the desired output. It should be noted that the control variables do not appear in the output equation, and no precise model of the dynamical system is required. Unlike the existing results, not only the input but also the iterative initial state are learned in this iterative algorithm, and the output error in each iteration is used to design the iterative law on line. Therefore, the iterative initial state may be obtained only by the desired output and partial information of the system. This algorithm is easy to implement in practical engineering, and thus the shortcomings of the existing results are avoided. Finally, the result is used to a robot system, and experiment shows that the convergence speed of this algorithm is increased compared with off line algorithms, and the conclusion is very effective in pratical systems.

Keywords： nonlinear systems   learning contr ol   desired signal

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引用本文：

严星刚;林辉;戴冠中. 一类非线性系统的D型在线学习控制[J]. 航空学报, 1999, 20(1): 28-30.

Yan Xinggang;Lin Hui;Dai Guanzhong. D TYPE ON LINE LEARNING CONTROL FOR A CLASS OF NONLINEAR SYSTEMS[J]. Acta Aeronautica et Astronautica Sinica, 1999, 20(1): 28-30.