*Dynamics of Continuous, Discrete and Impulsive Systems*
*Series* **B:** *Applications & Algorithms* **20 (2013)** 543-554


# CONJUGATE DIRECTION METHOD OF ITERATIVE LEARNING CONTROL FOR LINEAR DISCRETE TIME-INVARIANT SYSTEMS

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**Abstract.** In this paper, the conjugate direction method is used in designing a type of iterative learning control scheme for a kind of linear discrete time-invariant single-input-single-output systems, which is termed as a conjugate direction method based iterative learning control scheme. The convergence of the proposed learning scheme is analyzed by the technique of inductive inference in considering the characteristics of the conjugate directions. Compared with the existing Proportional-type and parameter-optimized iterative learning control methods, the proposed scheme requires milder condition with respect to the systems dynamics in guaranteeing its faster convergence and thus owns wider range for applications. Numerical simulations illustrate the effectiveness as well as the validity.

**Keywords.** Conjugate direction, Iterative learning control, Residual error, Tracking error.

**AMS (MOS) subject classification:** TP273.

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Received January 2013; revised October 2013.

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