

工程与应用

改进DRNN用于纸张水分定量解耦控制

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收稿日期 2009-3-2 修回日期 2009-4-16 网络版发布日期 接受日期

摘要 针对抄纸过程中纸机系统大滞后、非线性、时变且纸张的水分与定量之间存在严重耦合的问题, 提出一种基于改进DRNN神经网络辨识的PID解耦控制器。该控制器利用改进DRNN对定量与水分参数的Jacobian信息辨识结果, 自适应调整PID控制器的各项比例系数。仿真结果表明水分与定量之间相互影响很小, 能较好实现对象的解耦控制, 且适应能力强。实际运行结果表明, 该算法的投入提高了控制精度, 具有较强的鲁棒性。

关键词 [改进DRNN](#) [Jacobian辨识](#) [水分定量](#) [比例-积分-微分 \(PID\) 解耦](#)

分类号 [TP273](#)

Decoupling control of paper's moisture contents and basis weight based on improved DRNN

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Abstract

Against to large delay time, nonlinear, time variable and serious coupling between moisture contents and basis weight of paper in papermaking system, a PID decoupling controller based on improved DRNN identification is stated. In this method, the controller self-adjusts these parameters according to Jacobian information based on improved DRNN identification. The simulation results prove that strong adaption and weak interaction between moisture contents and basis weight. The realtime curves indicate the controller has improved definition greatly and has better robustness.

Key words [improved Diagonal Recurrent Neural Network \(DRNN\)](#) [Jacobian identification](#)
[moisture contents and basis weight](#) [PID decoupling](#)

DOI: 10.3778/j.issn.1002-8331.2009.23.060

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