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短文

冷连轧动态过程混合智能建模方法

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摘要
针对具有非线性、多变量、强耦合、参数不确定等综合复杂特性的多机架冷连轧动态过程，在工作点附近建立基于轧制过程动态机理方程的线性状态空间模型，提出基于RBF 的轧机出口带钢速度模型以及机架间厚度延时估计方法，采用案例推理技术实现线性化多模型选择算法，研制了冷连轧动态过程的混合智能模型.使用某钢厂五机架四辊冷连轧机系统的实际生产过程数据进行仿真实验，在实际板厚控制系统的设定和轧件的扰动下，本文提出模型的各机架轧制力、冷轧板厚度和张力仿真结果与实际值的变化趋势相同，最大误差小于20%.

关键词 冷连轧动态过程 线性化状态空间模型 混合智能模型

分类号 TP29

Hybrid Intelligent Modeling Approach for Dynamic Cold Tandem Rolling Process

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Abstract
This paper presents a hybrid intelligent model for multi-stand cold tandem rolling dynamic process, a system with compositive complexity including nonlinearity, multi variable, strong coupling, varying parameter as operation condition variation. The proposed model consists of the based state-space model based on linearized physical equations near rolling operating points, the exit strip speed RBF models and estimation approach for time lag of entry thickness, case-based reasoning technique based multi models selection algorithm for different operating points. With the actual thickness system setting and plate disturbance, the simulation results of roll force, strip thickness and tension have the same dynamic characteristics with theactual process data, and the error of each variable is less than 20%.

Key words Cold tandem rolling dynamic process linearized state-space model hybrid intelligent model

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