A framework of quality prediction in multivariable process based on nonlinear dynamical analysis

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Abstrak

Real-time prediction of process quality is the key factor for guaranteeing product performance static modeling method could not consider the impact of noise variables on quality characteristics, which will easily lead quality problem for instability. This paper proposes a dynamic quality modeling and prediction approach for multivariable process using nonlinear dynamical analysis. The quality state model any time of process is regarded as an evolution product obtained from the adjacent previous moment. Dual extended Kalman filter algorithm is introduced to real-time adjust the quality prediction model, which refers to the weights and the centers in radial basis function network. So the dynamic adaptive neutral network is proposed to predict the following state of quality. Finally, a case about crack prediction of continuous casting slab is conducted to illustrate the feasibility of proposed approach, result shows that it could accurately crack the nonlinear dynamic continuous casting process.