System Identification of Thermal Process using Elman Neural Networks with No Prior Knowledge of System Dynamics

Abstract

Dynamic Neural networks have been verified as identifiers due to its capability for manipulating processes in parallel and enduring noisy sorts of the input signals. They make them outstanding contenders for system identification applications. This paper presents a method for a black box system identification based on Elman neural network (ENN) for thermal process system to generate a prototype for the dynamical system of the thermal process without any past information about the system dynamics. This identification approach is compared to its counterpart conventional feedforward neural network (CFFNN) based system identification. The comparative simulations show that the ERNN gives an excellent results and outperforms the CFFNN in terms of accuracy with little degradation in the speed of convergence which make this neural network a motivating candidate for adaptive and gain scheduling controllers.

References

1. Dong, Ze, Pu Han, Dongfeng Wang, and Songming Jiao. "Thermal Process System
System Identification of Thermal Process using Elman Neural Networks with No Prior Knowledge of System Dynamics


**Index Terms**

Computer Science Networks

**Keywords**
Backpropagation algorithm, Elman neural networks, black box modeling, online training, offline training