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Fitting transducer characteristics to measured data using a virtual curve tracer

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Outline



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Abstract

This paper presents an artificial neural network based approach of transducer modeling in a computer-based measurement system. Transducer's static response characteristic is generally highly non-linear. However, if linear approximations were acceptable, for a given accuracy level, noise and measurement errors are always present. Therefore, curve-fitting procedures are required frequently to average these effects. With the facility of computation now available through digital computers and microprocessors, the problem of estimation of transducer's input-output static response characteristics is being increasingly tackled using software techniques. However, for an inherent nonlinear transducer, a software solution depends upon the proper approach through mathematical modeling of the response curve. An artificial neural network based virtual curve tracer is proposed for modeling, testing and calibration of transducers. The implemented functions are described. Experimental results of the comparative study in modeling the static response characteristic of a strain-gauge pressure transducer using adaptive single-layer linear network and multilayer feed-forward back-propagation network are presented.

FEEDBACK 



Keywords

Transducer; Calibration; Modeling; Nonlinearity

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