

APPLICATION OF ARTIFICIAL NEURAL NETWORK IN QUALITY CONTROL

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Abstract

Artificial Neural Network (ANN) is used in manufacturing field for varied applications like Process Control, Quality Control & Industrial Inspection, optimization, product & process modelling.

Quality control application of ANN with reference to manufacturing deal with fault detection, trouble shooting, inspection.

Present work deal with estimation of manufacturing component diameter using ANN approach for a job which is manufactured on precision lathe machine. Process parameters are defined and (L9) orthogonal array method is used to set up design of experiments.

A simulation model of experimentation is constructed in ANN for key parameters like speed, feed, depth of cut and tool material. A supervised ANN is constructed and trained. This trained network is used to estimate component diameters for various other experimentation conditions. The technique of appropriate training set of ANN, its structure and training algorithm are described. The results of simulation modelling of this approach are presented in the paper.

Actual validation of the same is done by carrying out machining as per set parameters and results are compared.

Keywords: Artificial Neural Network, Orthogonal Array, Design of Experiments, Process Capability.