

Artificial neural network-based texture classification using reduced multidirectional Gabor features

ABSTRACT

In this paper, a technique to classify Engineering Machined Textures (EMT) into the six classes of Turning, Grinding, Horizontal-Milling, Vertical-Milling, Lapping and Shaping, is presented. Multidirectional Gabor features are firstly extracted from each image followed by a dimensionality reduction step using Principal Components Analysis (PCA). The images are finally classified using a supervised Artificial Neural Network (ANN) classifier. Experimental results using a 72-image dataset demonstrate that PCA is able to reduce computational time while improving classification accuracy. In addition, the use of the proposed Gabor filter seems to be more robust compared to other existing techniques.

Keyword: Texture features extraction; Features reduction; ANN classification; Gabor filter; Principal component analysis