

Texture analysis for flaws detection in ultrasonic images

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Abstract : In this paper, we present two approaches to detecting a flaw in TOFD (Time Of Flight Diffraction) type ultrasonic image based on texture features. Texture is one of the most important features used in recognizing patterns in an image. The paper describes texture features by two methods: Multiresolution analysis such as wavelet transforms and Gabor filters bank. These filters are based on Gaussian shaped band-pass filters, with dyadic treatment of the radial spatial frequency range and multiple orientations. These filters represent an appropriate choice for tasks requiring simultaneous measurement in both space and frequency domains. The most relevant features are used as input data on a Fuzzy C-Mean clustering classifier. We use two classes: 'defects' or 'no defects'. The proposed approach is tested on the TOFD image achieved at laboratory and industrial field.

Keywords : Texture analysis, NDE, TOFD image, Wavelet transform, Gabor filters, Fuzzy logic