

Application of Pattern Recognition Technique to the Quality Characterization of Superficial Microstructures in Steel Coatings

Authors : H. Gonzalez-Rivera, J. L. Palmeros-Torres

Abstract : This paper describes the application of traditional computer vision techniques as a procedure for automatic measurement of the secondary dendrite arm spacing (SDAS) from microscopic images. The algorithm is capable of finding the lineal or curve-shaped secondary column of the main microstructure, measuring its length size in a micro-meter and counting the number of spaces between dendrites. The automatic characterization was compared with a set of 1728 manually characterized images, leading to an accuracy of $-0.27 \mu\text{m}$ for the length size determination and a precision of ± 2.78 counts for dendrite spacing counting, also reducing the characterization time from 7 hours to 2 minutes.

Keywords : dendrite arm spacing, microstructure inspection, pattern recognition, polynomial regression

Conference Title : ICPRML 2025 : International Conference on Pattern Recognition and Machine Learning

Conference Location : Rio de Janeiro, Brazil

Conference Dates : February 26-27, 2025