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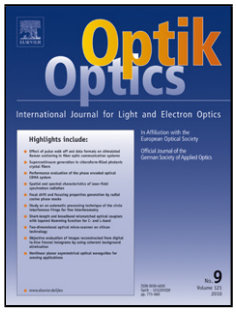

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Authors: K. Gajalakshmi, S. Palanivel, N.J. Nalini, S. Saravanan, K. Raghukandan

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ACCEPTED MANUSCRIPT

GRAIN SIZE MEASUREMENT IN OPTICAL MICROSTRUCTURE USING SUPPORT VECTOR REGRESSION

K. Gajalakshmi[1], S. Palanivel[1], N.J. Nalini[1], S. Saravanan[2], K. Raghukandan[3]
[1]Department of Computer Science and Engineering, Annamalai University, Annamalainagar.
[2]Department of Mechanical Engineering, Annamalai University, Annamalainagar.
[3]Department of Manufacturing Engineering, Annamalai University, Annamalainagar.

Corresponding author

K.Gajalakshmi

Department of Computer Science and Engineering

Annamalai University

Email: gajusaran@gmail.com

Phone: +91-9150610187

Abstract

The objective of this study is to develop an image processing algorithm to determine the average grain size in a metallic microstructure by counting the number of grains using support vector regression (SVR). Automatic grain size measurement algorithm is implemented in the microstructural analysis to attain high speed along with accuracy than manual methods. The grain boundaries of various metals were determined using Otsu and canny edge detection techniques. The edge detected image is divided into blocks and the number of white to black transitions in each block is used as feature. The extracted features are used to train the support vector machine in regression mode. The number of grains in test image is determined using support vector regression. The accuracy of developed algorithm is verified using the manual intercept method. The experimental results show that the canny edge detection based feature

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