

Accepted Manuscript

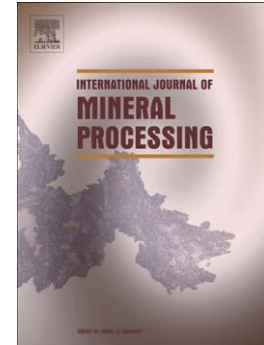
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PII: S0301-7516(16)30170-3
DOI: doi: [10.1016/j.minpro.2016.08.016](https://doi.org/10.1016/j.minpro.2016.08.016)
Reference: MINPRO 2948

To appear in: *International Journal of Mineral Processing*

Received date: 20 May 2015
Revised date: 24 August 2016
Accepted date: 31 August 2016



Please cite this article as: Zhang, Zelin, Particle overlapping error correction for coal size distribution estimation by image analysis, *International Journal of Mineral Processing* (2016), doi: [10.1016/j.minpro.2016.08.016](https://doi.org/10.1016/j.minpro.2016.08.016)

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Particle Overlapping Error Correction for Coal Size Distribution Estimation by Image Analysis

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Abstract: *Particle overlapping is a serious but largely ignored problem in size distribution estimation using image processing technology. A new correction method for particle overlapping error in coal size distribution estimation is proposed in this paper. Particles of four different size fractions were each sprayed with different colors to easily identify the size fractions. A semi-automatic local-segmentation algorithm was proposed to segment coal particle regions in this investigation. Moreover, an interval statistical method was used to calculate the probability of overlapping particles that belong to the four size fractions, and the probability distribution curves of the four size fractions were fitted by the Least Square Method. Similar function models were selected according to the characteristics and shapes of the probability distribution curves. Root Mean Square Error (RMSE) and R-squared parameters were used to measure the fitting effects. It was found that using overlap correction models reduced the maximum and minimum absolute error of particle size estimation from 7.5% and 4.3% with no overlap correction to 4.5% and 0.5%, respectively, when the developed overlap models were used.*

Key Words: *Size distribution; Particle Overlap; Error correction; Image analysis*

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