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Steel Strip Surface Defect Identi?cation using MultiresolutionBinarized Image Features

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Abstract: The shaped steel strip, in the hot rolling process,may exhibit some surface ?aws. Their origin could bethe internal discontinuities in the input product or thethermomechanical transformation of the material, duringthe shaping process. Such defects are of a random occurrenceand may lead to costly rework operations or to adowngrading of the ?nal product. So, they should bedetected and identi?ed as soon as possible, to allow atimely decision-making. For such a quality monitoring, theused vision systems are mainly based on an imagedescription and a reliable classi?cation. In this paper, weexplore pre-de?ned image ?lters and work on a procedureto extract a discriminant image feature, while realizing thebest trade-off between the improved recognition rate of thesurface defects and the computing time. The proposedmethod is a multiresolution approach, based on theBinarized Statistical Image Features method, employed todate in biometrics. The ?lters, pre-learnt from naturalimages, are applied to steel defect images as a new surfacestructure indicator. They provide a quite discriminating image description. A relevant data reduction is used togetherwith a classi?er to allow an ef?cient recognition rate ofthe defective hot rolled products.

Keywords : Computer vision, statistical features, Classi?cation, strip surface defects, hot rolling process