

Steel Strip Surface Defect Identification using Multiresolution Binarized Image Features

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Abstract: The shaped steel strip, in the hot rolling process, may exhibit some surface flaws. Their origin could be the internal discontinuities in the input product or the thermomechanical transformation of the material, during the shaping process. Such defects are of a random occurrence and may lead to costly rework operations or to a downgrading of the final product. So, they should be detected and identified as soon as possible, to allow a timely decision-making. For such a quality monitoring, the used vision systems are mainly based on an image description and a reliable classification. In this paper, we explore pre-defined image filters and work on a procedure to extract a discriminant image feature, while realizing the best trade-off between the improved recognition rate of the surface defects and the computing time. The proposed method is a multiresolution approach, based on the Binarized Statistical Image Features method, employed today in biometrics. The filters, pre-learned from natural images, are applied to steel defect images as a new surface structure indicator. They provide a quite discriminating image description. A relevant data reduction is used together with a classifier to allow an efficient recognition rate of the defective hot rolled products.

Keywords : Computer vision, statistical features, Classification, strip surface defects, hot rolling process