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一种黑片图像亚像素边缘检测方法

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摘要:为了提高黑片图像边缘检测的精度,提出了利用亚像素边缘检测技术来检测黑片图像的边缘.针对 Zernike 矩的亚像素边缘检测算法存在计算量大和边缘定位精度低等不足,利用 Sobel 算子对图像进行像素级边缘提取,然后利用改进的 Zernike 矩算子来检测黑片图像的亚像素边缘,为了防止 Sobel 算子遗漏可能的亚像素点,增加了一个搜索算法来提高检测的精度.实验结果表明,该方法测量精度高,定位精确,能够应用于黑片的在线检测.

关键词:Zernike 矩;亚像素;边缘检测;Sobel;黑片
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A Silicon Sheet Steel Image Sub-pixel Edge Measurement Method

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Abstract: In order to improve the accuracy of Silicon sheet steel edge location, a sub-pixel edge detection method is presented in this paper. With the consideration that the Zernike moments has some limitation, such as the large amount of calculation and extracted wider edge than that of the original image, an improved method is proposed. Sobel operator is used to calculate the gray-level gradient image and locate one pixel accuracy, then the sub-pixel positioning algorithm of Zernike moments operator is used to calculate locations of object edges. In order to prevent the possible omission of sub-pixel, a search method is used to raise the detection accuracy. The experimental results show that this method has high accuracy, which positioning accuracy, which can be applied to the Silicon sheet steel inspection.

Key words: zernike moments; sub-pixel; edge detection; Sobel; silicon sheet steel

基于机器视觉的测量技术在人类视觉无法感知的场合,如精确定量感知、危险场景感知和不可

见物体感知等更突显其优越性.在工业领域,基于机器视觉的测量技术已成功地用于零件的识别与定位、产品质量检验、刀具磨损监控、精密测量和移动机器人导航等领域^[1-2].黑片是制作变压器的一种材料,其平面几何参数的精确度对变压器的性能有重大影响.通过实时在线检测黑片的平面几何参数,可以识别产品是否合格,从而生产出符

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