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基于Chan-Vese模型的TFT-LCD Mura缺陷快速分割算法

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摘要：针对传统的Chan-Vese模型（C-V模型）分割背景不均匀的TFT-LCD Mura缺陷速度慢的问题，将水平集函数与符号距离函数的偏差作为能量项引入C-V模型，去掉了符号距离函数重初始化步骤；为了平衡图像的整体亮度不均匀，在传统的C-V模型中引入轮廓曲线内、外部区域之间的亮度差项，提高了分割准确性。在数值实现上，采用无条件稳定的半隐差分格式，适当加大步长，加速曲线演化过程，相比于有限差分格式和AOS格式，分割速度明显提高。实验结果表明，本文提出的算法能够准确地分割背景不均匀的Mura缺陷图像，并且分割速度快。

关键词：Chan-Vese模型 TFT-LCD Mura缺陷 水平集 半隐差分格式

Algorithm for fast TFT-LCD Mura defect image segmentation based on Chan-Vese model

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Abstract: Aiming at the issue of low efficiency of traditional Chan-Vese model(C-V model) method for uneven background TFT-LCD Mura defect segmentation, a new formulation which was the difference between the level set function and signed distance function was introduced to C-V model to completely eliminate the re-initialization procedure of signed distance function. In order to reduce the effect from non-uniformity brightness of image, the C-V model was proved by adding the brightness difference between inside and outside area of the contour curve to improve the accuracy of the segmentation. In the numerical implementation, the unconditionally stable semi-implicit scheme was used to accelerate the evolution velocity by increasing the time step appropriately. This semi-implicit scheme has higher segmentation speed than the finite difference scheme and AOS format. The results show that the proposed algorithm can segment the uneven background Mura defect accurately and rapidly.

Keywords: Chan-Vese model TFT-LCD Mura defect level set semi-implicit scheme

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