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A Region-Based Model and Binary Level Set Function Applied to Weld Defects Detection in Radiographic Images

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Abstract: In this paper, we propose a model for active contours to detect boundaries' objects in given image. The curve evolution is based on Chan-Vese model implemented via binary variational level set formulation. The particularity of this model is the capacity to detect boundaries' objects without need to use gradient of the image, this property gives its several advantages: it allows detecting both contours with or without gradient, it has ability to detect automatically interior contours, and it is robust in the presence of noise. For increasing the performance of model, we introduce the level sets function to describe the active contour, the more important advantage to use level set is the ability to change topology. Experiments on synthetic and real (weld radiographic) images show both efficiency and accuracy of implemented model.

Keywords : image segmentation, Curve evolution, Chan-Vese Model, EDPs, Level set, radiographic images