

Extraction of weld defect from radiographic images using the level set segmentation without reinitialization

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Abstract : All level set based image segmentation methods are based on an assumption that the level set function is close to assigned distance function (SDF). Small time step and costly reinitialization procedure must be applied to guarantee this assumption, and in order to calculate the gradient, simple numerical schemes, based on finite differences, are applied. In this paper, in order to achieve higher order accuracy in the temporal discretization, we have used Total Variation Diminishing (TVD) Runge Kutta (RK) methods. The spatial derivatives are determined by using the Weighted Essentially Non-Oscillatory methods (WENO-5) that accurately capture the formation of sharp gradients in the moving fronts. In the other hand, we have used the level set method without re-initialization in order to speed up the evolutionary process. Experiments results show that we have obtained good results both on synthetic and real images.

Keywords : Image segmentation; active contour; level set