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# A Variational Level Set Approach applied to detect weld defects in radiographic images

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**Abstract :** This paper presents a variational level set approach applied to segment images; especially to detect welds defects in radiographic images. Level set methods are a general and powerful technique to represent an object's boundary by the means of an implicit function that has a specific value on the boundary. The evolution is obtained with updating partial differential equations (PDE). The spatial derivatives are improved by using high order approximations “Essentially Non Oscillatory scheme (ENO)”. Also the level set function is easily initialized with a binary function, which is more efficient to construct than the widely used signed distance function (SDF). The computational cost for traditional reinitialization can also be reduced. The proposed algorithm has been applied to both synthetics and real (weld radiographic) images with promising results.

**Keywords :** image segmentation, weld defects, Curve evolution, Level set, PDE