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Fast Level Set Algorithm for Extraction and Evaluation of Weld Defects in Radiographic Images

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Abstract: The classification and recognition of weld defects play an important rolein weld inspection. In this paper, in order to automate inspection task, we proposean aide-decision system. We believe that to obtain a satisfied defects classificationresult, it should be based on two kinds of information. The first one concerns thedefects intensity and the second one is about its shape. The vision system containsseveral steps; the most important ones are segmentation and feature computation.The segmentation is assured using a powerful implicit active contour implementedvia fast algorithm. The curve is represented implicitly via binary level set function.Weld defect features are computed from the segmentation result. We have computedseveral features; they are ranked in two categories: Geometric features (shapeinformation) and Statistic features (intensity information). Comparative study, onsynthetic image, is made to justify our choice. Encouraging results are obtained ondifferent weld radiographic images.

Keywords : Code generation, State machine, Radiographic inspection, image segmentation, Level set, Region-based models, Features computation