Hybrid Shape Descriptors for an Improved Weld Defect Retrieval in Radiographic Testing

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Abstract: In this paper, four region-based shape descriptors well reported in the literature are used to characterize weld defect types of crack, lack of penetration, porosity and solid inclusion, usually encountered in radiographic testing of welds. The rectangularity and the roundness in the geometric descriptor (GEO) are used in order to propose an hybridization algorithm so that the hybrid descriptor issued from GEO and each of the other descriptors becomes more discriminant in such application where, due to bad radiographic image quality and weld defect typology, the human film interpretation is often inconsistent and labor intensive. According to the results given in the experiments, the efficiency of the proposed hybrid descriptors is confirmed on the weld defects mentioned above where, the retrieval scores are significantly improved compared to the original descriptors used separately.

Keywords : Radiographic film, weld defects, shape descriptors, hybridization algorithm