

Detection Defects Surface of Welding Image with Transform Coefficients

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Abstract- In welding technology and getting flawless welding is the ultimate goal but different defects are created for various reasons and should be analyzed for disposal. The aim of the research work is to identify and classify various types of surface defects that are generally encountered during the FSW process using orthogonal polynomials coefficients. Defects on the welding surface are determined using the pyramid of the image and the image rebuilding algorithms. Moreover, using these algorithms, defects can be categorized into voids, grooves, cracks, keyhole and ash with the help of unique features for each type of defect. The plot of the vertical intensity and the area of the point points area are represented for proper localization and analysis of the severity of the defects.

1. Introduction

The process of welding is friction (FSW) relatively new participants in welding technology. The solid-state joining process was invented by the Welding Institute (TWI) in 1991 [1]. The process is simple, environmentally friendly and energy efficient and has wide applications in various industrial fields such as automotive, aircraft and aerospace, as it can weld low density materials such as aluminum and magnesium. Effectively [2,4,5]. It is observed that the joints FSW has high strength; is almost close to the base metal and also helps in significantly saving weight compared to other fastening processes as less deep material is not added during welding. It is said that during FSW there is no liquid weld pool condition and therefore the FSW temperature rise is lower and approximately 0.7-0.9 times that of the metal melting temperature [3-5].

Welding quality is affected by various types of defects that occur during the process FSW. Much effort is made in this regard to identify welding defects. Several researchers have analyzed surface defects in the FSW process. Defects such as cavities, surface grooves and ash can occur due to an inappropriate set of process parameters leading to excessive or insufficient heat or abnormal excitation.[3]. Kim et al. [6]I mentioned that volumetric defects develop inFSW at cooler operation parameters such as low rotational speed and high transverse. The sizes of these defects depend on the size of the counterfeiting forces in the force control mode. Non-influencing counterfeiting force can lead to surface or grooved