# A Defect Detection Model for Casting Product using Wavelet Transform Denoise and Xception

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*Abstract*— **In the Fourth Industrial Revolution, Smart convergence of manufacturing including information and knowledge is rapidly taking place. Inspecting the quality to produce a complete product is a very important factor. Casting is the basic process of manufacturing. Casting products are completely melted and made into a liquid state, then poured into a mold to solidify and solidify. These casting products are being used in various fields such as automobile industry, shipbuilding industry, and machinery industry. In order to make a casting product, the quality inspection must be carried out strictly according to the specification standard. Therefore, it is important to accurately check the presence or absence of defects in the casting, identify the cause, and take corrective measures. Methods for quality inspection include visual inspection and vision inspection. In this paper, we propose to improve defect detection using Wavelet Transform denoise and Deep Learning for cast images used to quality inspection to accurately detect defects in cast products. The purpose of this study is to apply a Gaussian noise filter to a general image using a data set and apply the Wavelet Transform Denoise algorithm. Finally, We improved the noise data and evaluate the classification performance, and the improved performance was obtained through the experiment.**

*Keyword*— **Casting, Manufacturing, Surface defect, Deep Learning, Xception, Wavelet Transform**

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