Degree of Circularity Measurement for Plastic Cups Defect Inspection System

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ABSTRACT

Visual inspection system in the industry is mostly done manually by humans. These systems have various weakness caused by many factors, such as operator fatigue, lack of motivation, experience, proficiency and others. To overcome this problem, then a visual inspection systems in industry has been effectively replaced by an automated system. One of the automation system of inspection is to use a camera which is used to determine objects defect. A plastic cups defect inspection system is designed with neural network backpropagation and measuring the degree of circularity. A plastic cups image from the camera is processed by using the threshold of each color. Cropping done with the goal of taking a picture of green plastic cup, then continued on treatment with backpropagation neural network method to determine the level of plastic cups defect. As a comparison, it is measurements of the degree of circularity top view image of plastic cups. A plastic cups image is using a thresholding to produce black and white image. This image will be processed using the method of identification of a circle with measuring the degree of circularity. With neural network method has an error in the inspection of green plastic cups by 16.67% with a percentage value that is not consistent and the standard deviation of 9.8535. This is due to be affected by light, so that thresholding is not working properly. While using the identification of the circle has a circularity value is more consistent with a standard deviation value is 0.04483. It has average error of 6.347% from minor axis and mayor axis ratio.

Keywords: Threshold, Cropping, Neural Network, Circularity