

ABSTRACT

Textiles play a vital role in a wide range of sectors, from clothing to automotive and medical. Technological innovations in textile production continue to create new opportunities, especially in terms of strength, durability and flexibility. In 2023, textile production in West Java experienced significant growth in terms of volume, value, exports and imports. However, mass production increases the risk of manufacturing defects due to standardized machinery, continuous operation, and insufficient quality control of raw materials. Therefore, special attention is needed to maintain the quality and sustainability of the textile industry in West Java. One effective way to improve production quality is through automatic detection of manufacturing defects. This research aims to detect production defects to improve the quality of textiles in West Java. The stages of this research include the creation of a production defect detection system using the CNN (Convolutional Neural Network) method with the Tensorflow framework and the architecture to be used using conventional CNN and CNN with ResNet50v2 architecture by tuning the appropriate hyperparameters, the research results are obtained in the form of a model that can detect defects in fabrics with accuracy, precision, recall and f1-score values of 97% each for ResNet50v2 and for conventional CNN has an accuracy performance of 87%, precision 88%, recall 88% and f1-score 88% and Visualization of interactive web applications to detect production defects. With the results of this research, it is hoped that it can improve the quality of textile production in West Java, especially at PT Gracia Mega Karya.

Keywords-- Convolutional Neural Network, Defect Detection, Image Processing, ResNet, Textiles