

ABSTRACT

Barcode is a gathering of black and white line compiled vertically. Every line has different thickness. The number and level of thickness of line has different meaning. This number and level of thickness of line will differentiate the type of barcode. Barcode provides an encoding method of text information that is simple and cheap. The text information that was decoded is in the form of specific data like production code, expired date, identity number, and others. Although there are other encoding methods, barcode is still used. This is because of the main excess of barcode, easy and cheap.

In this final project, the design of encoder and decoder barcode based on digital image processing was done by using morphology method. Barcode yielded from system encoder barcode which will be designed. The barcode which has been created will be read by barcode decoder. The barcode image which will be read is taken by using a digital camera. After image is created, the image will be transform to gray image, noise reduction with median filter, contrast enhancement with histogram equalization, and transform the gray image to binary image (monochrome). After that, the image will be cropped. This process is to get only barcode image. The next processing is morphology method. This method will produce the best barcode image. Then to get the best barcode image, is done morphology method. This final image will be decoded to get the information code.

The designed system will be tested for its performance level through several parameters like accuracy, errors, and distance between barcode and digital camera. There are 4 kind of barcode that the system tested. They are 000000000000, 999999999993, 123456789012, and 089686010947 with 4 different resolution: 30 x 95, 60 x 190, and 90 x 285 pixel. The examinations are done trough 3 parameters, like distance, barcode rotation, and camera friction. The distance that was used in examination are 5 cm, 10 cm, 15 cm, and 20 cm. While the rotation and friction were use 0°, 5°, and 10° for the examination. Through implementation and examination, the system can provide maximum level of accuracy and performance.

The examination had shown good result. In distance parameter, the examination had shown 95% accuracy. In barcode rotation parameter, the examination had shown 90% accuracy in 5° rotation. Also in camera friction parameter, the examination had shown 86% accuracy in 5° accuracy. While the examination had shown bad result in 10° of rotation or friction.

Keywords: barcode, encoder, decoder, digital camera, morfology