

ABSTRACT

Barcode is a coding method by utilizing a collection of black and white lines are arranged vertically. The combination of black and white line is what will form a code from the barcode. Although there are other coding methods, the barcode is still being used. This is caused by the main advantages of barcode, the application is easy and relatively cheap. Coding system always consists of encoder and decoder. Barcode decoder system is highly developed and currently is a frequently used infrared decoder system. However, current infrared decoder system still tends to be expensive and its use is also limited. So it needs a decoder system that is cheaper and available for public use. System that allows the system which utilizes digital image processing method because it's been a lot of camera technology is applied to electronic appliances.

In this final, barcode decoder system design based on real-time webcam and digital image processing is done by using morphological methods. Its processes are image acquisition, image conversion to gray image, changing the gray image into binary image (monochrome), rotation with Hough-transform method, preprocessing, cropping, decode the bar, and display.

Designed system consists of three systems, that are the offline system, semi real-time system, and real-time system. Through the implementation and testing, the system is able to straighten the image of a barcode with an angle of -90° to 90° . In offline system, the average accuracy of system is 98.07% and 1.93% error with an average processing time of 1.14 seconds. In the semi-real-time systems, the average accuracy of system 97.43% and amounted to 2.57% error with an average processing time of 1.15 seconds. In real-time system, the accuracy is 90% and the error at 10% of the successful and least readable and barcode on the product for the accuracy of digits decoded result will be worth 100% but there were time to position the barcode on the condition of box webcam. System prototype can already distinguish the UPC barcode type-A and EAN-13.

Keywords: *barcode, decoder, real-time, webcam*