

## **Color QR code recognition utilizing neural network and fuzzy logic techniques**

### **ABSTRACT**

Quick Response (QR) code is popular type of two dimensional barcode. The key feature of QR code is larger storage capacity and high damage resistance compared to the traditional barcodes. Color QR code is the future as it provides much higher encoding capacity, but it also brings tremendous challenges to the decoding because of color interference and illumination. This research paper presents a method for QR code recognition using the Neural Network (NN) and fuzzy logic techniques. We created a framework for image decoding. First, the color QR code is converted to black and white then the QR code is recognized using neural network. Next, the original colors are returned to the QR code. The colors are enhanced using fuzzy logic and then, the enhanced color QR code is split into three barcodes which are red, green and blue. Finally, each QR code is converted to black and white and sent to ZXing library for decoding and obtained the original data. ZXing library has been utilized for decoding and recognition purposes and has produced satisfactory results. This research proof that by, utilizing NN and fuzzy logic techniques has produced better QR code success rates of five percent.

**Keyword:** QR code; Artificial intelligence (AI); Neural network; Fuzzy