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# ROBUST INVISIBLE QR CODE IMAGE WATERMARKING IN DWT DOMAIN

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**ABSTRACT:** Quick Response (QR) code is 2d code and widely used in magazine advertisement, product packet, museum, and tour tickets. It has high data capacity compare to 1d code. The invisible QR code is watermarked via popular wavelet transform algorithm in images. The results show that the proposed method is robust and tested against attacks.

**KEYWORDS:** QR code, watermarking, Wavelets.

## I. INTRODUCTION

In this modern era mobile and wireless technology is taking over all fields of life. They are more than a communication device; they act as your PC, music player, your bank, your shopping area and more [1]. In near future the smart glasses like google glass are going to replace the current hand held devices which make to overlay the physical world with a digital layer of tags, ads, maps etc [2].

In current smart phone scenario, one of the important technology used to connect the physical world to internet or digital world using smart phone, is QR codes. They are used mainly for marketing and commerce but their applications are numerous including virtual marketing, virtual maps, QRpedia etc. We are making the QR code as invisible watermark in image using digital watermarking technology. Other alternatives proposed were marking QR code in invisible ink which is only visible with Ultraviolet [3], QR transparent stickers etc.

The main challenge in making invisible QR code is the detector part. Since the detection is expected to be done in smart phone which has slower processors, the detection must be very simple with very little processing required before passing information to QR reader. Here we implement and simulate the QR encoder and decoder in MATLAB to study the effectiveness of algorithm. This paper uses watermarking scheme in wavelet domain where multiple copies of QR code is inserted into low frequency components of host image. Since the data requires no secrecy compared to existing watermarking schemes, public watermarking technique is used [4] [5] [6].

# Invisible Watermarking Matlab Source Code

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