Proprietary Encryption (Z-QR)

Project: lab journal

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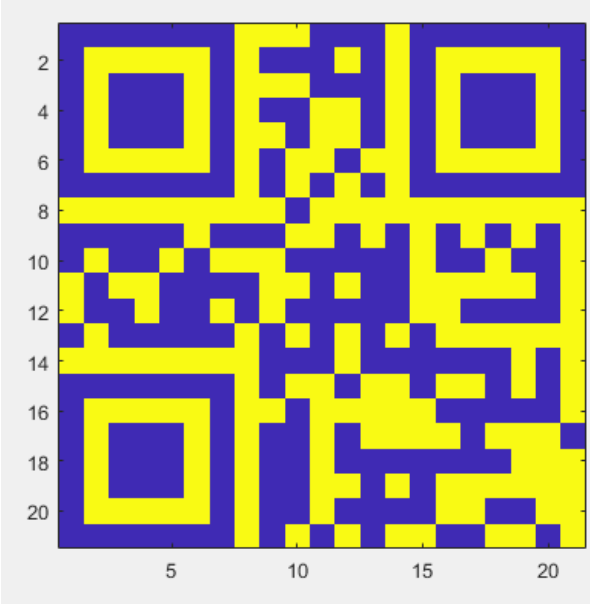
MONDAY, 7/15/2019

I created the first program in Matlab as that is my expertise. The idea is to then port it to python so Marc may apply it to the website or put it on the raspberry pi.

Today I made the program generate a pixel image from any QR picture input, to make it easier as every square is dealt as one pixel.

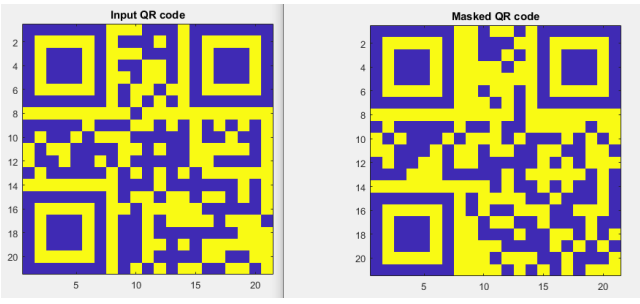
image.png



TUESDAY, 7/16/2019

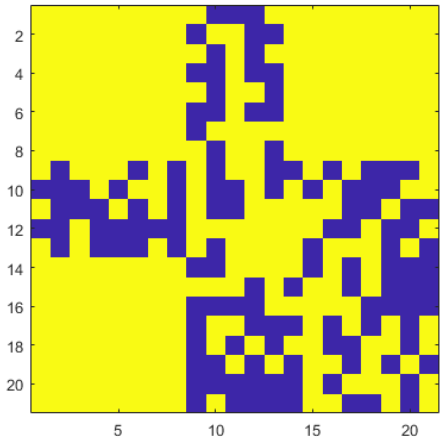
Today I focused on applying the mask to the QR code so that it is not readable anymore. However the mask applied is random

image.png



The mask I applied in this case being (where the blue spots are, the QR code's point change

mask.png



FRIDAY, 7/19/2019

Rewrote the QR code translating from png to pixel form on python so that the code is more flexible

SUNDAY, 7/28/2019

Wrote some code on python that allows the input of images and detects QR codes to feed our own code

MONDAY, 7/29/2019

wrote python code that is able to detect QR codes from the computer camera

TUESDAY, 8/27/2019

added features to the code so that it's easier for the QR to be detected, including some shape detection software

Sequential Double Digest

Introduction

This is the Sequential Double Digest Protocol with Standard Restriction Enzymes. If there is no buffer in which the two enzymes exhibit > 50% activity, this sequential digest can be performed.

More information from NEB can be found here.

Double Digests can be designed using NEB's Double Digest Finder.

NEBcloner will help guide your reaction buffer selection when setting up double digests.

See the NEBuffer Activity/Performance Chart with Restriction Enzymes for the incubation temperatures.

Materials

- DNA **1 µg**
- NEBuffer
  - 1X
- NEB Restriction Enzymes
- Deionized Water

Procedure

Sequential Double Digest

1. Set up the following reaction using the restriction endonuclease that has the lowest salt concentration in its recommended buffer (total reaction volume **50 µl**).
2. Set up the following digest reaction on ice

Table1

	A	B	C
1		Volume (µl)	
2	**Buffer (10x)**	5	
3	**DNA ***	Input Volume for ng	
4	**Restriction Enzyme #1 ****	1	
5	**Deionized Water (µl)**	1	
6	**Total Volume (µl)**	#VALUE!	

*A 50 µl reaction volume is recommended for digestion of 1 µg of substrate.
** Restriction Enzyme, 10 units is sufficient, generally **1 µl** is used
***The enzyme should be the last component added to reaction

3. Mix components by pipetting the reaction mixture up and down, or by "flicking" the reaction tube.

4. Quick ("touch") spin-down in a microcentrifuge. Do not vortex the reaction.

5. Incubate for 1 hour at the enzyme-specific appropriate temperature.

01:00:00

Can be decreased to 5-15 minutes by using a Time-Saver™ Qualified Restriction Enzyme
See the NEBuffer Activity/Performance Chart with Restriction Enzymes for the incubation temperatures.

6. Adjust the salt concentration of the reaction (using a small volume of a concentrated salt solution) to approximate the reaction conditions of the second restriction endonuclease.

   Alternatively, a spin column can be used to isolate the DNA prior to the second reaction.

7. Add the second enzyme.

   ** Restriction Enzyme #2, 10 units is sufficient, generally **1 µl** is used

8. Mix components by pipetting the reaction mixture up and down, or by "flicking" the reaction tube.

9. Quick ("touch") spin-down in a microcentrifuge. Do not vortex the reaction.

10. Incubate for 1 hour at the enzyme-specific appropriate temperature.

    Can be decreased to 5-15 minutes by using a Time-Saver™ Qualified Restriction Enzyme
    See the NEBuffer Activity/Performance Chart with Restriction Enzymes for the incubation temperatures.