

STEGANOGRAPHY

Stanko Krtalic Rusendic

@monorkin

github.com/Stankec

Ruby on Rails Engineer @ Q Alliance

01

WATERMARKS





JMG Galleries
WWW.JMG-GALLERIES.COM



STEGRANOGRAPHY

steganography

/stɛɡəˈnɒɡrəfi/

noun

the practice of concealing messages or
information within other non-secret text or data.

OS

IMAGES





ISO 3200 18 mm *f* / 3,5 1/1000 sec

 Photo is missing

Title

Caption

Copyright

Copyright Status

Unknown ▾

Creator

Sublocation

Rating

.

Label



Capture Time

18:51:48



Capture Date

30 Apr 2015



Dimensions

5184 x 3456

Cropped

5184 x 3456



Exposure

1/1000 sec at *f* / 3,5

Focal Length

18 mm

ISO SpeedRating

ISO 3200



Flash

Did not fire

Make

Canon

Model

Canon EOS 700D

Lens

EF-S18-55mm f/3.5-5.6



EXIF, iTXt (PNG), comment (JPEG)

Are extremely easy to spot and to strip



04

LSB

Byte of data

1

0

0

1

1

0

1

0

Bytes of color

R	1	1	1	1	1	0	1	0
G	0	0	1	0	1	0	0	0
B	1	0	1	1	1	0	1	1

Bytes of color

R	1	0	0	1	1	0	1	0
G	1	1	1	0	1	0	0	0
B	0	1	0	1	1	0	1	1

1byte of data = 1pixel


```
def build_file_package(file)
  file_name = File.basename(file)
  data = file.read

  [
    file_name.length,
    file_name.unpack('C*'),
    [data.length].pack('q*').unpack('C*'),
    data.unpack('C*')
  ].flatten
end

def infuse_components_with_byte(store, r, g, b, byte)
  store << (byte ? (r & 248 | ((byte >> 5) & 7)) : r)
  store << (byte ? (g & 252 | ((byte >> 3) & 3)) : g)
  store << (byte ? (b & 248 | (byte & 7)) : b)
end
```

```
# image.ppm
```

```
P3
```

```
4 4
```

```
15
```

```
#r    g    b      r    b    g
```

```
  0    0    0      0    0    0      0    0    0      15    0  15
```

```
  0    0    0      0  15    7      0    0    0      0    0    0
```

```
  0    0    0      0    0    0      0  15    7      0    0    0
```

```
15    0  15      0    0    0      0    0    0      0    0    0
```


05

RESULT



**Audio encoded in my image?
Count me surprised.**



PROBLEMS

- Compression (e.g. PNG => JPEG)
- Manipulation (Filters, Tints, Rotation, Resizing)

07

PLANS

- Opensource all algorithms
- Remove dependency on ImageMagick