

Hiding Data in Images

Steganography Part III

Time to Put It All Together

Hide
This

You are learning about a new, digital world --- a world in which you can create things like web pages and programs and then share them with your friends or everyone.

In
This



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- Recall: math on colors
 - Division, multiplication, adding

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Need to do for each pixel
For R, G, and B components
Same thing 3 times? Write function

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- Familiar programming ideas:
 - Repetition over each pixel

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For each pixel

Red = $\text{Math.floor}(\text{red}/16) * 16$

Green = $\text{Math.floor}(\text{green}/16) * 16$

Blue = $\text{Math.floor}(\text{blue}/16) * 16$

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chop2hide



- More complex than other problems
 - Split into multiple steps?

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In
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shift



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chop2hide



For each pixel

Red = `Math.floor(red/16)`

Green = `Math.floor(green/16)`

Blue = `Math.floor(blue/16)`

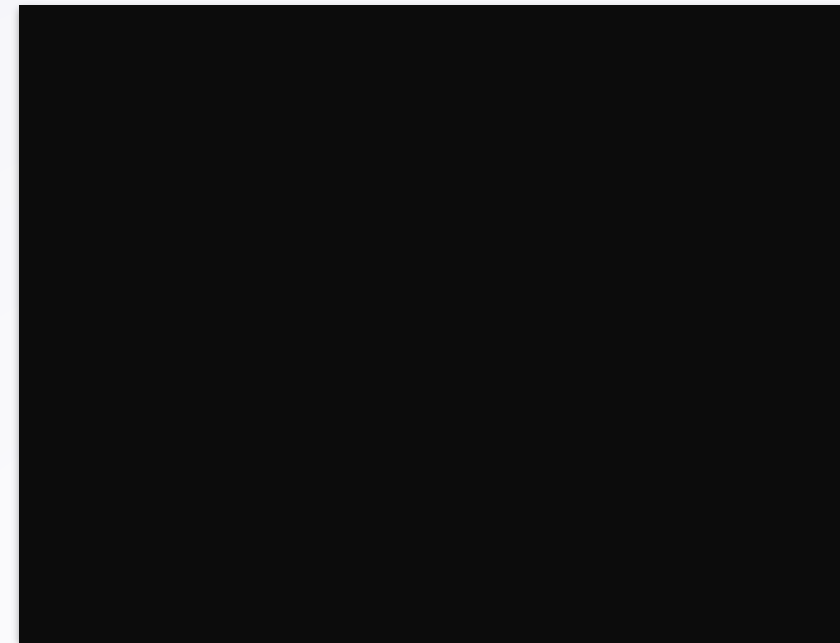
- More complex than other problems
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shift



combine



In
This



chop2hide



- Combine: for each pixel,
 - Add red to red, green to green, blue to blue

High-Level Algorithm

```
var start = new SimpleImage("usain.jpg");  
var hide = new SimpleImage("skyline.jpg");  
  
start = chop2hide(start);  
hide = shift(hide);  
var stego = combine(start,hide);  
print(stego);
```

- Uses 3 functions we just discussed
 - Each one iterates over pixels

Chop2Hide

```
function clearbits(pixval) {  
    var x = Math.floor(pixval/16) * 16;  
    return x;  
}  
function chop2hide(image) {  
    for(var px of image.values()) {  
        px.setRed(clearbits(px.getRed()));  
        px.setGreen(clearbits(px.getGreen()));  
        px.setBlue(clearbits(px.getBlue()));  
    }  
    return image;  
}
```

- chop2hide: $\text{Math.floor}(\text{color} / 16) * 16$

Hiding: Other Functions

- Other Hiding Functions: Similar
 - Iterate over pixels, do math to R,G, B
- What about extraction?
 - We'll leave that to you
 - You know the math
 - Develop algorithm with 7 steps
 - Do step 1 with 2 pixel image
 - Step 2, 3, 4, ...