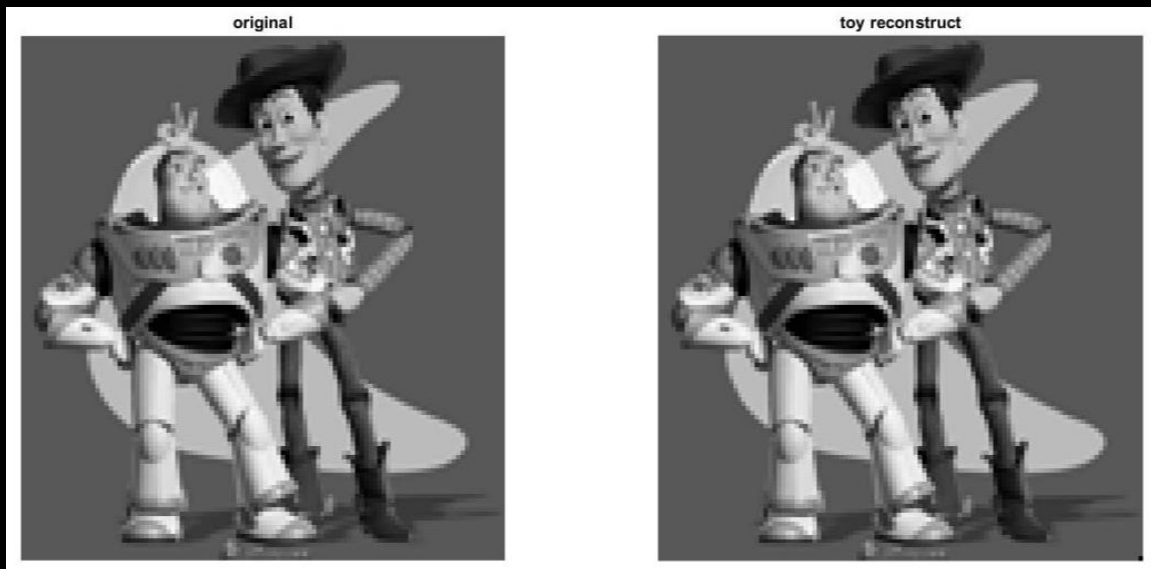# Assignment #3: Gradient-Domain Fusion

1) Toy Problem:

Toy image reconstructed from gradient values of the original image with error = 0.3451. Gradient value of each pixel is a combination of the difference between the pixel's right side neighbor and down side neighbor.


```
>> proj3_starter
> In toy_reconstruct (line 39)
  In proj3_starter (line 10)
Warning: Rank deficient, rank = 13089, tol =  3.447465e-10.
Error: 0.3451
```

2) Poisson Blending:

Used the gradient of the source to calculate the pixels inside the masked region, and gradient of the background to calculate the pixels at the border of the masked region. The result is a smoother transition from the background image to the colors in the masked region. However, one drawback is that sharp edges of the background or the target object gets blurred.

➢ Result 1

Background

Source

Direct copy

Poisson blending

➢ Result 2

Background

Source

Direct copy

Poisson blending

➢ Result 3

Background

Source

Direct copy

Poisson blending

3) Mixed Gradients

Pick the larger gradient between the background and the source object as the color to fill in the masked region. This method remain sharp edges of the background and the source object.

➢ Result 1

Background

Source

Direct copy

Poisson blending

➤ Result 2

Background

Source

Direct copy

Mixed blending

➢ Result 3

Background

Source
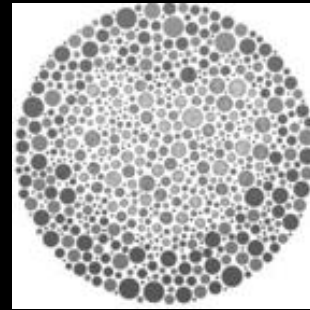

Direct copy

Mixed blending
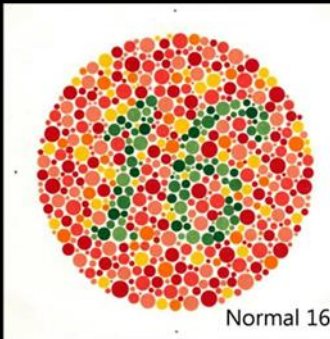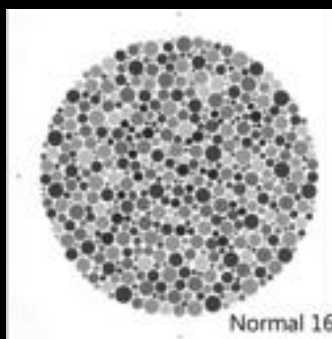
4) Color2Gray

➢ Result 1
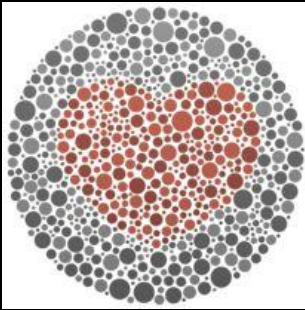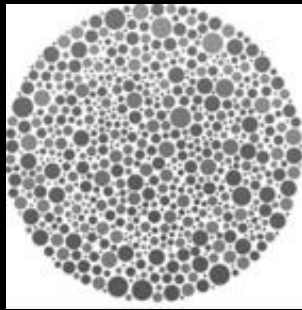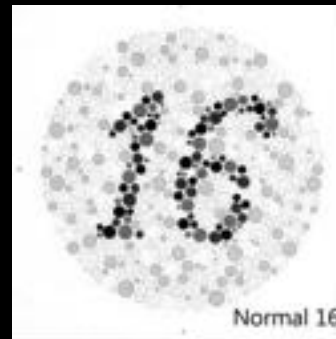

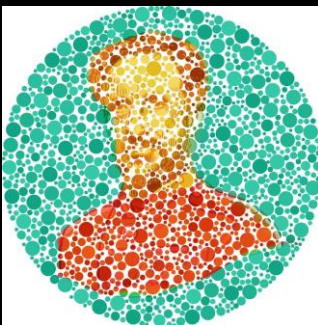| Source image | rgb2gray | color2gray |

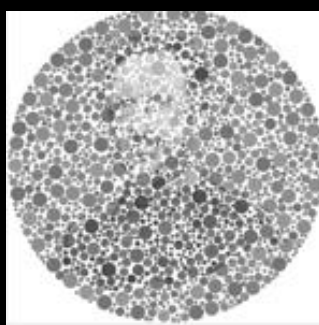➢ Result 2

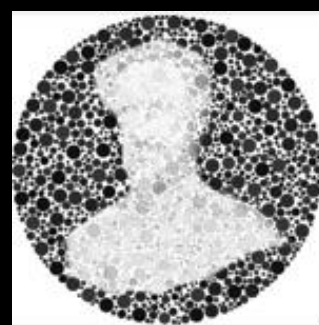| Source image | rgb2gray | color2gray |

➢ Result 3

| Source image | rgb2gray | color2gray |

Gray image calculated from gradient domain using toy_reconstruct function.

5) My Favorite blending image

Target

Source

Direct copy

Poisson blending