chap_color_

September 8, 2018

```
In [3]: %inverse color
        %read an image, and show the inverse color image

In [4]: %color image
        I = imread('lena.jpg');
        imshow(I)
        figure
        imshow(255-I)
```

In [5]: `%rgb to gray image`
```matlab
Ig = rgb2gray(I);
imshow(Ig)
Ig_inv = 255-Ig;
figure
imshow(Ig_inv)
% figure
% imshow(Ig+Ig_inv+100)
```

```
In [ ]: %intensity gamma transform
        Jg = I.^(0.04);
        subplot(121)
        imshow(I,[])
        subplot(122)
        imshow(Jg,[])

In [ ]: %intensity gamma transform
        Jg = I.^(3);
        subplot(121)
        imshow(I,[])
        subplot(122)
        imshow(Jg,[])

In [ ]: %intensity gamma transform
        I1 = imread('Picture1.png');
        I1 = im2double(I1);
        J1 = I1.^(1.5);
        imshow(J1,[])

In [ ]: %color image gamma transformation
        I = imread('color_img1.jpg');
        imshow(I)
```

```
In [ ]: %nonlinear color transformation
        %gamma correction
        J = double(I);
        gamma = 2;
        J(:,:,1) = 255*(J(:,:,1)/255).^(1/gamma);
        % J(:,:,2) = 255*(J(:,:,2)/255).^(1/gamma);
        % J(:,:,3) = 255*(J(:,:,3)/255).^(1/gamma);
        imshow(uint8(J))

In [ ]: %linear color transformation
        T = eye(3);
        T(2,2) = 2;

        J1 = reshape(J,size(J,1)*size(J,2),size(J,3))*T;
        imshow(uint8(reshape(J1,size(J))))

In [ ]: %color tone transformation
        %given an image with light tone, try to make it 'older'
        J_new = imread('new_pic.jpg');
        J_old = imread('old_pic.jpg');
        imshow(J_new)
        figure
        imshow(J_old)
        whos J_new

In [ ]: J_old_1 = reshape(double(J_old(1:10,100,:)),3,10);
        J_new_1 = reshape(double(J_new(1:10,100,:)),3,10);
        %how to find the transformation matrix???
        %A = J_old_1*J_new_1'*inv(J_new_1*J_new_1')

In [ ]: J_old_g = reshape(double(J_new),size(J_new,1)*size(J_new,2),size(J_new,3))*A;
        imshow(uint8(reshape(J_old_g,size(J_new))))

In [ ]: %skin detection based on color
```