Sample 2-4

画像データの入出力

ヒストグラム均等化

画像処理特論

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動作確認: MATLAB R2020a

Input and output of images

Histogram equalization

Advanced Topics in Image Processing

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Verified: MATLAB R2020a

サンプル画像の準備

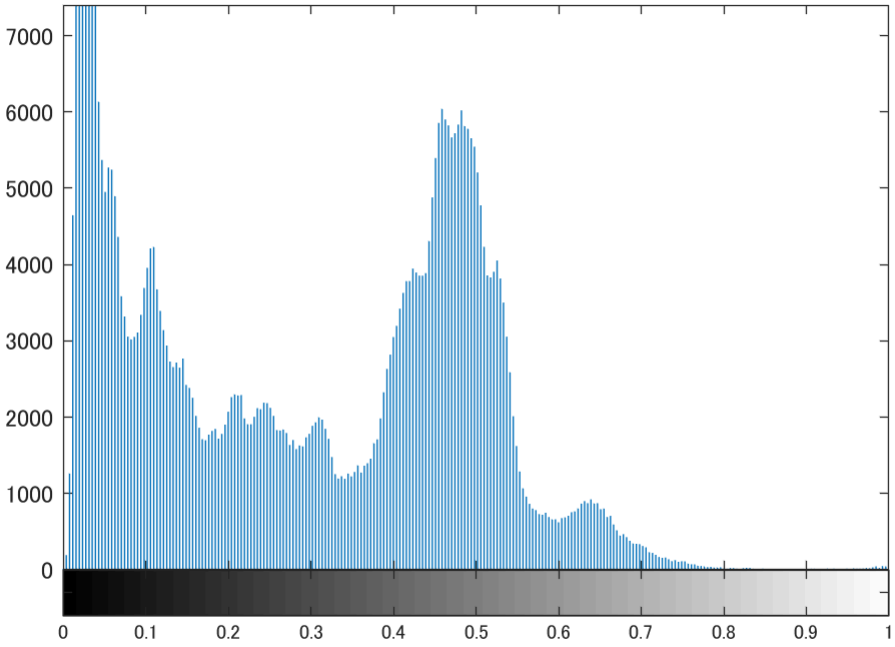
(Preparation of sample image)

本サンプルで利用する画像データを収めたdata フォルダにパスをとおす。

Create a path to the data folder that contains images used in this sample.

```
addpath('./data')
close
% Reading original image
I = im2double(rgb2gray(imread('firenzeRgb.jpg')));
figure(1)
imshow(I)
title('Original')
```


```
figure(2)
imhist(I)
```



ヒストグラム均等化前の加工

(Process before histogram equalization)

$$v = T_1(x) = x^{\gamma}$$

$$y = T_2(v) = \frac{1}{2}(\text{sign}(2v-1)|2v-1|^{10^{-\alpha}} + 1)$$

```
% Definition of process
gamma = 1
```

```
gamma = 1
```

```
alpha = 0
```

```
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```
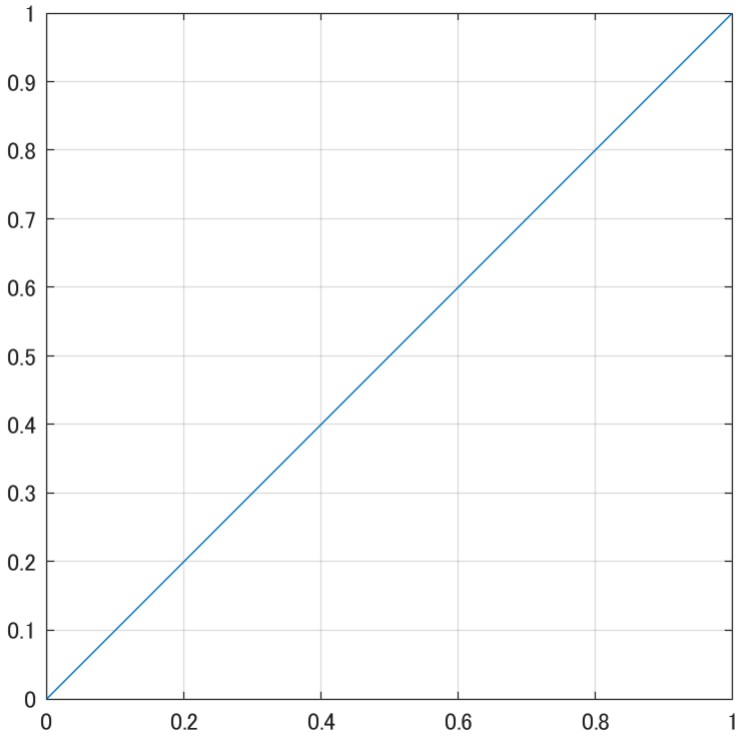
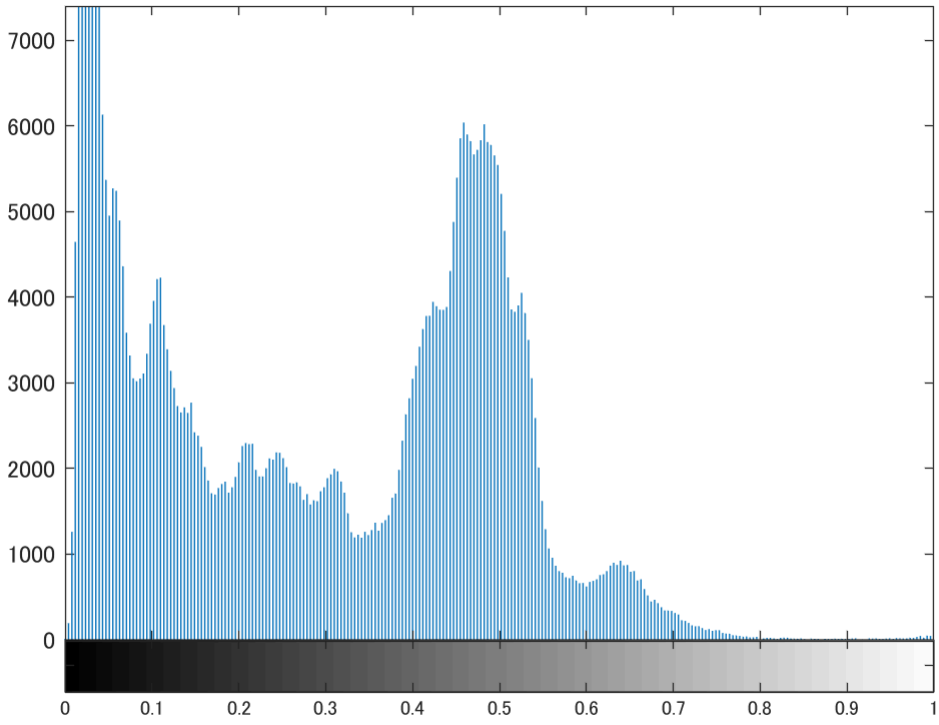

```
T1 = @(x) x.^gamma;
T2 = @(v) 0.5*(sign(2.0*v-1.0).*abs(2*v-1.0).^(10^(-alpha))+1.0);
Tp = @(x) T2(T1(x));
figure(3)
fplot(Tp,[0,1])
axis square
grid on
```




```
% Preprocessing for histogram equalization
J = Tp(I);
figure(4)
imshow(J)
title('Preprocessed image for histogram equalization')
```


```
figure(5)
imhist(J)
```



ヒストグラム均等化

(Histgram equalization)

```
% Power law conversion with IMADUST function
K = histeq(J);
figure(6)
imshow(K)
title('Result of histogram equalization')
```


```
figure(7)
imhist(K)
```