Color Model

이진영

RGB


0 0 0 Black
255 255 255 White
255 0 0 Red
0 255 0 Green
0 0 255 Blue
R G B ???
Y Y Y ???
High B
High R
High G

RGB Images

YCbCr

- Y for luminance
- Cb and Cr for color difference

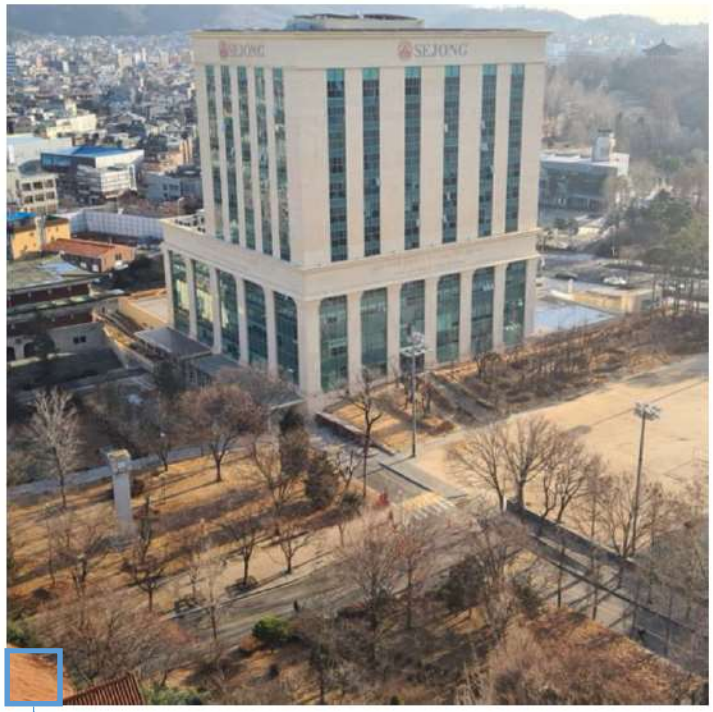
```
Y = 0.299 * inputImg[j * stride + 3 * i + 2] + 0.587 * inputImg[j * stride + 3 * i + 1] + 0.114 * inputImg[j * stride + 3 * i + 0];
Cb = -0.169 * inputImg[j * stride + 3 * i + 2] - 0.331 * inputImg[j * stride + 3 * i + 1] + 0.500 * inputImg[j * stride + 3 * i + 0];
Cr = 0.500 * inputImg[j * stride + 3 * i + 2] - 0.419 * inputImg[j * stride + 3 * i + 1] - 0.0813 * inputImg[j * stride + 3 * i + 0];

R = Y + 1.402 * Cr;
G = Y - 0.714 * Cr - 0.344 * Cb;
B = Y + 1.772 * Cb;
```

$$0 \leq Pixels \leq 255$$

```
outputImg[j * stride + 3 * i + 2] = (unsigned char)(Y > 255 ? 255 : (Y < 0 ? 0 : Y));
outputImg[j * stride + 3 * i + 1] = (unsigned char)(Y > 255 ? 255 : (Y < 0 ? 0 : Y));
outputImg[j * stride + 3 * i + 0] = (unsigned char)(Y > 255 ? 255 : (Y < 0 ? 0 : Y));
```

24 Bit BMP

RGB→YYY in our experiments
(For Gray-Level Images)

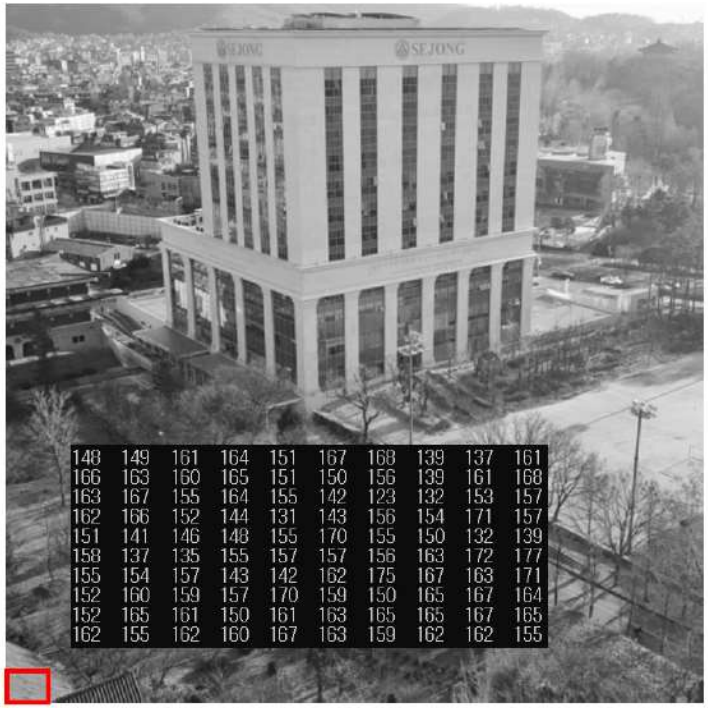


Other Models

- CMY – Cyan(청록색), Magenta(자홍색), Yellow
- HSI – Hue(색), Saturation(채도), Intensity(밝기)

```
I = (unsigned char)((inputImg[j * stride + 3 * i + 2] + inputImg[j * stride + 3 * i + 1] + inputImg[j * stride + 3 * i + 0]) / 3);
```

Difference



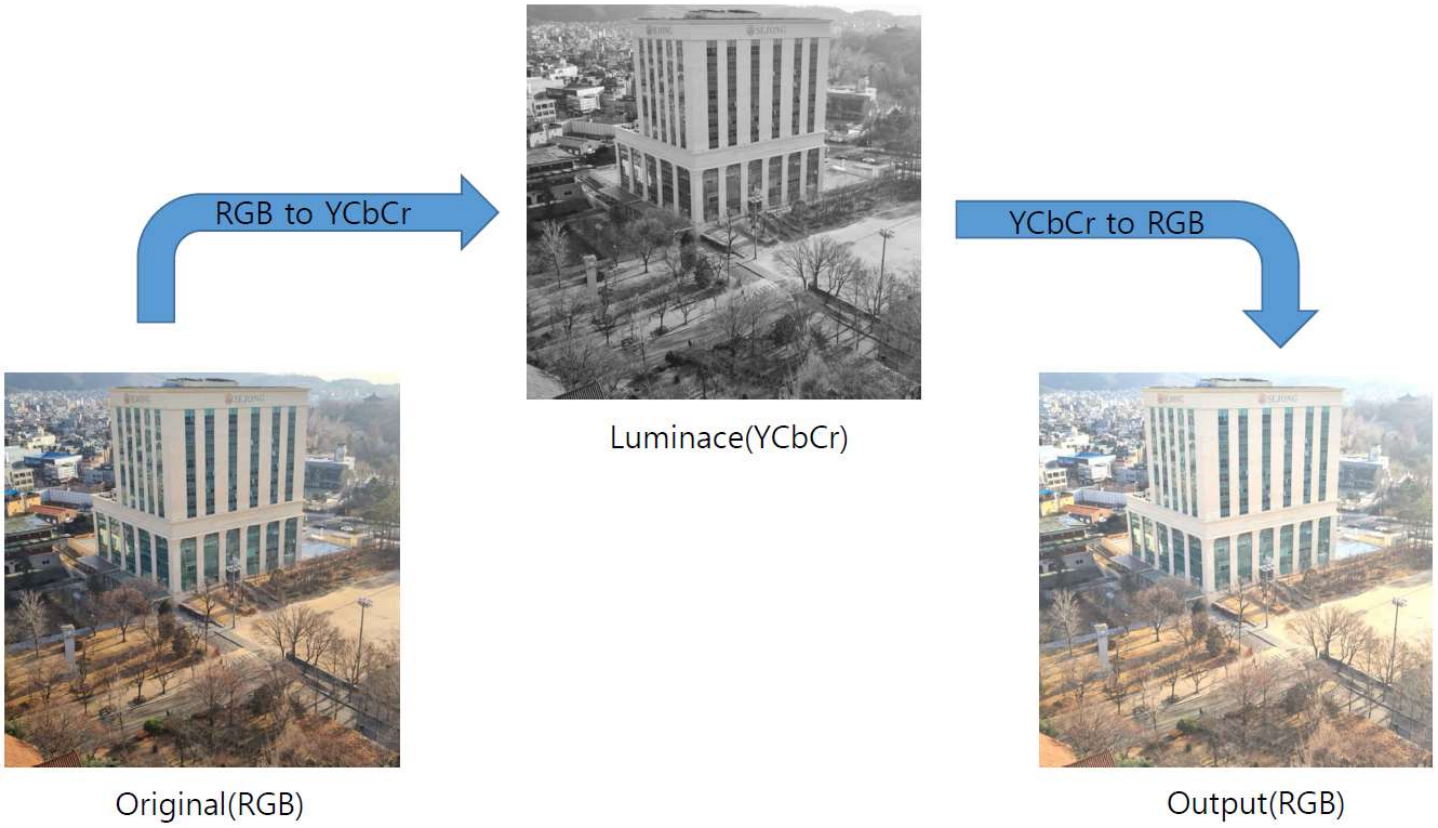
Y from YCbCr

I from HSI

Y-Based Image Processing

- Black and white TV
- Sensitivity of the eye to luminance and chrominance components

Conversion


RGB to YCbCr
YCbCr to RGB
Luminace(YCbCr)
Original(RGB)
Output(RGB)

Gray-Level Image

Original(RGB)

AICenter.bmp

RGB to YCbCr

Luminace(YCbCr)

=

Y Y Y

AICenterY.bmp