

Computer Vision Hw3 Report

- Discription
 - Histogram Equalization
- Algorithm
 - - histogram equalization histogram linearization
$$s_k = 255 \sum_{j=0}^k \frac{n_j}{n}$$
 - $k = 0, 1, \dots, 255$, n_j : number of pixels with intensity j
 - n : total number of pixels
 - ● for every pixel if $I(im, i, j) = k$ then $I(imhe, i, j) = s_k$
- Parameters (if any)
 - no

- Principal Code Fragment

Histogram equalization

(file – /src/cv1.util.cv /ImgUtil.java)

```
public static BufferedImage histogramEqualization(BufferedImage bi){
    BufferedImage source= toGrayImage(bi);
    BufferedImage result = new BufferedImage(source.getHeight(), source.getWidth(), source.getType());

    //get gray histogram
    int hist[] = getImgHistogramMatrix(source);

    //accumulate histogram
    int sumHist[] = new int[hist.length];
    int sum=0; //total pixel
    for (int i = 0; i < hist.length; i++) {
        sum += hist[i];
        sumHist[i] = sum;
    }

    //transfer
    for (int y = 0; y < source.getHeight(); y++) {
        for (int x = 0; x < source.getWidth() ; x++) {
            int gray = source.getRGB(x, y)&0xff;
            int newGray = (int) Math.round(255*( sumHist[gray]*1.0/sum));
            result.setRGB(x, y, 0xff000000 + (newGray<<16)+ (newGray<<8)+ (newGray));
        }
    }

    return result;
}
```

- Result Image

Histogram equalization



Histogram after equalization

