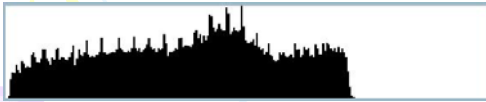


Histogram

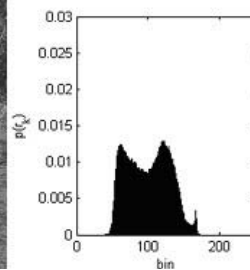
- Probability distribution of the different grays in an image

$$p(x_i) = \frac{r_{i,j}}{n}$$



Contrast Enhancement

- Limited gray levels are used
- Hence, low contrast
- Enhance contrast

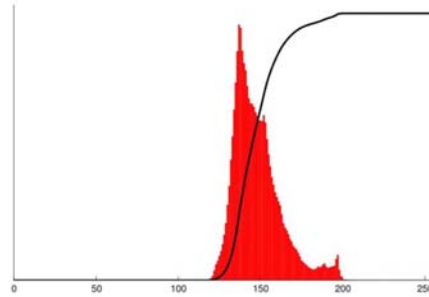


Histogram Stretching

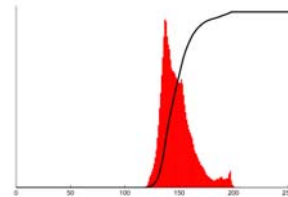
$$c(i) = \sum_{j=0}^i p(x_j)$$

- Monotonically increasing function between 0 and 1
- $c(0) = 0$
- $c(1) = 1$

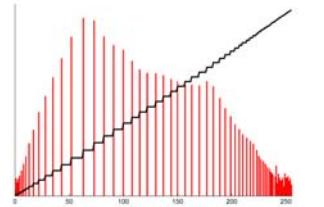
$$y_i = T(x_i) = c(i)$$



Results



Results

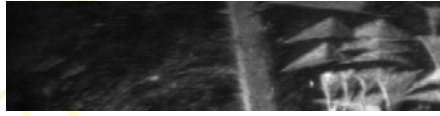


Burn out effects

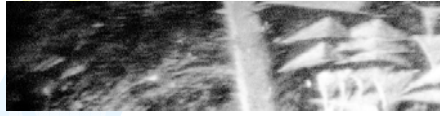
Adaptive Histogram Stretching

- Choose a neighborhood
- Apply histogram equalization to the pixels in that window
- Replace the center pixel with the histogram equalized value
- Do this for all pixels
- Compute intensive
- Leads to noise

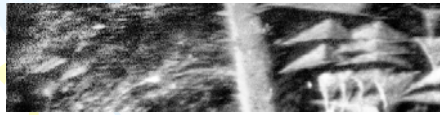
Effect of neighborhood size



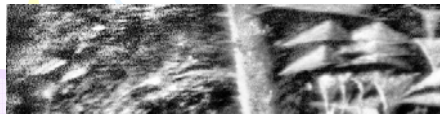
Original Image



Global Histogram Equalization



Adaptive Histogram Equalization
(100 pixels neighborhood)



Adaptive Histogram Equalization
(50 pixels neighborhood)



Adaptive Histogram Equalization
(12 pixels neighborhood)

Histogram Matching

Histogram 1

Histogram 2

$$c(i) = \sum_{j=0}^i p(x_j)$$

