

Histogram equalization for discrete case

- Now, f only assumes discrete amplitude values f_0, f_1, \dots, f_{L-1} with empirical probabilities

$$P_0 = \frac{n_0}{n} \quad P_1 = \frac{n_1}{n} \quad \dots \quad P_{L-1} = \frac{n_{L-1}}{n} \quad \text{where } n = \sum_{l=0}^{L-1} n_l \quad \leftarrow \text{pixel count for amplitude } f_l$$

- Discrete approximation of $g = T(f) = \int_0^f p_f(\alpha) d\alpha$

$$g_k = T[f_k] = \sum_{i=0}^k P_i \quad \text{for } k = 0, 1, \dots, L-1$$

- The resulting values g_k are in the range $[0,1]$ and might have to be scaled and rounded appropriately.

Histogram equalization example



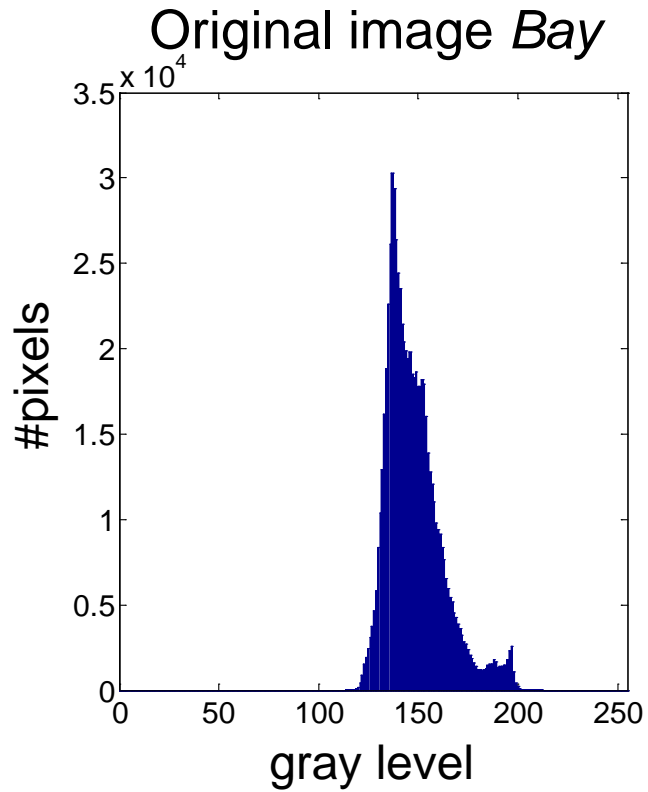
Original image *Bay*



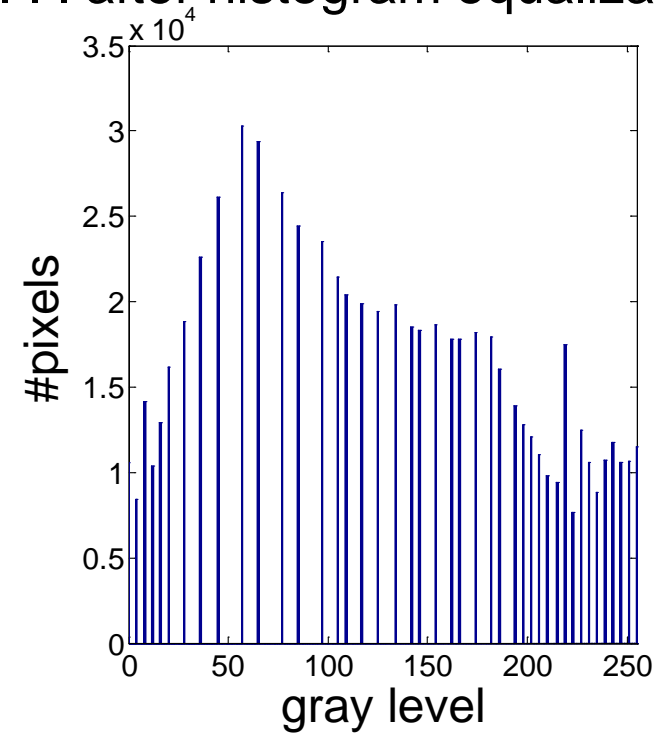
... after histogram equalization



Histogram equalization example



... after histogram equalization



Histogram equalization example



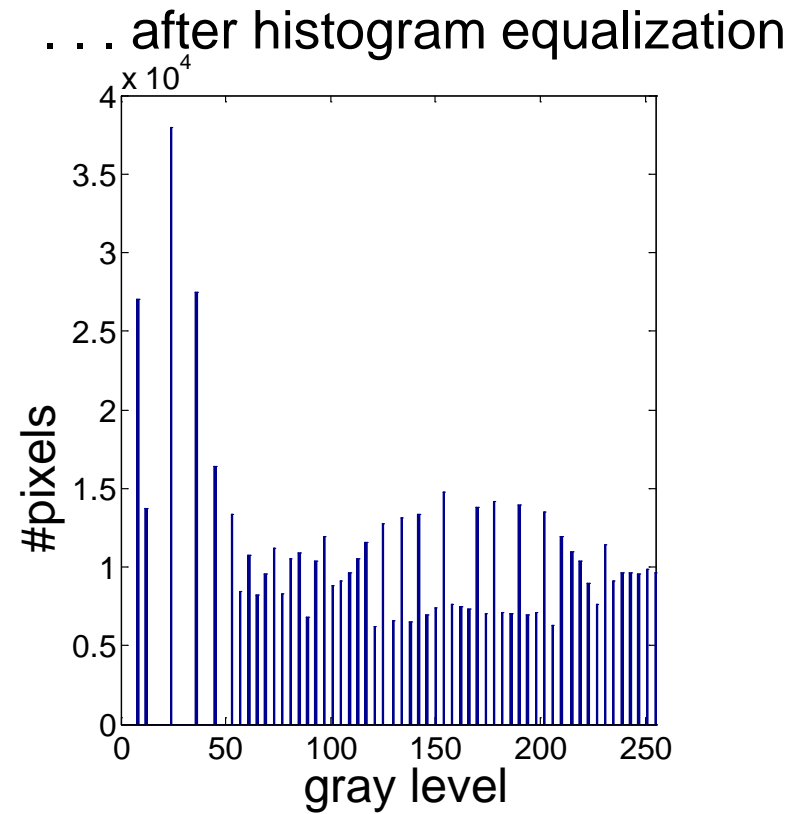
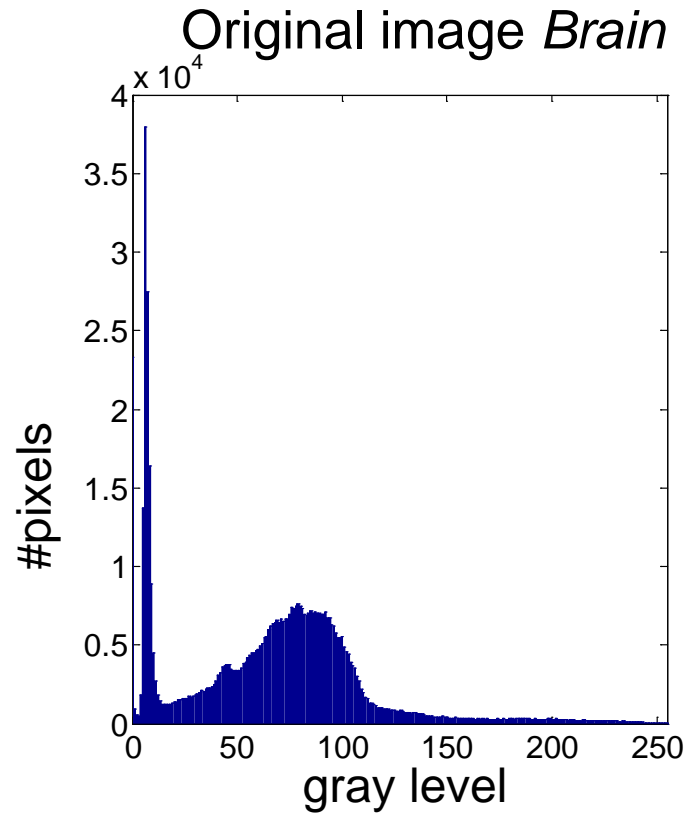
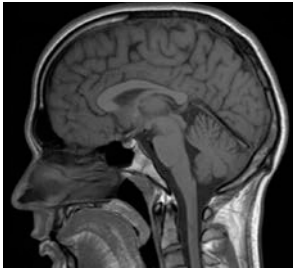
Original image *Brain*



... after histogram equalization



Histogram equalization example



Histogram equalization example



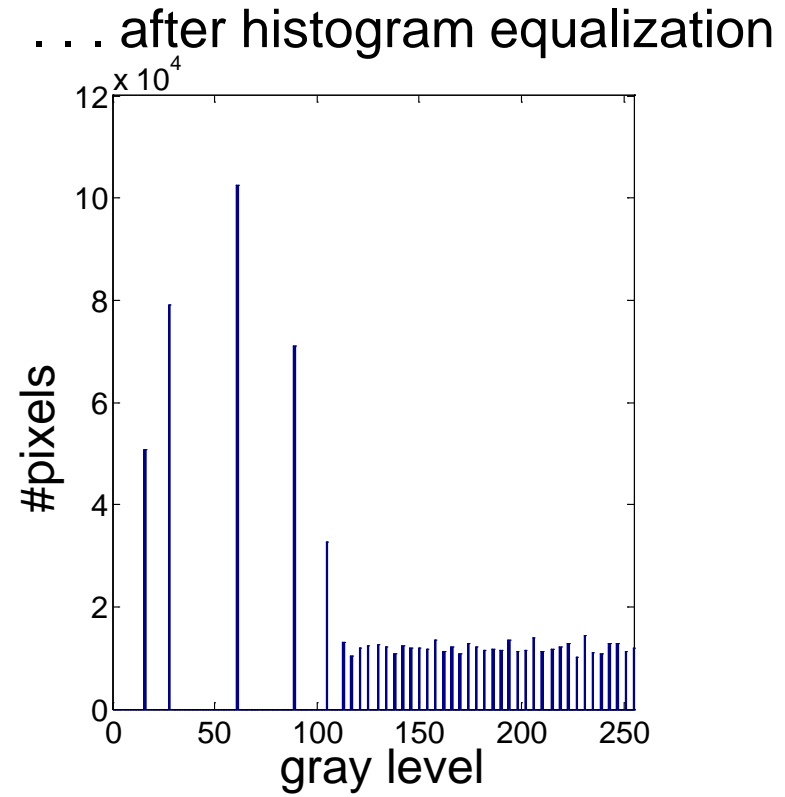
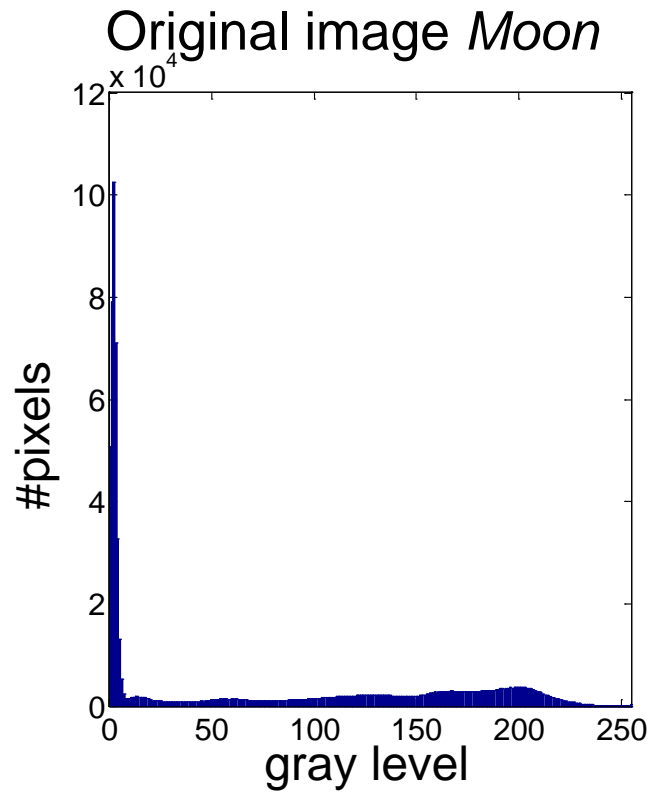
Original image *Moon*



... after histogram equalization



Histogram equalization example



Contrast-limited histogram equalization

