



Figure 4(a)



Figure 4(b)

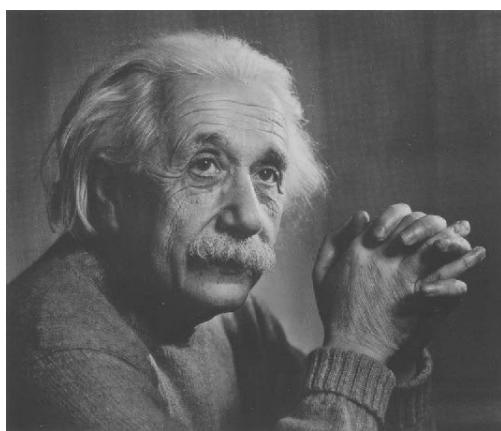


Figure 5(a)

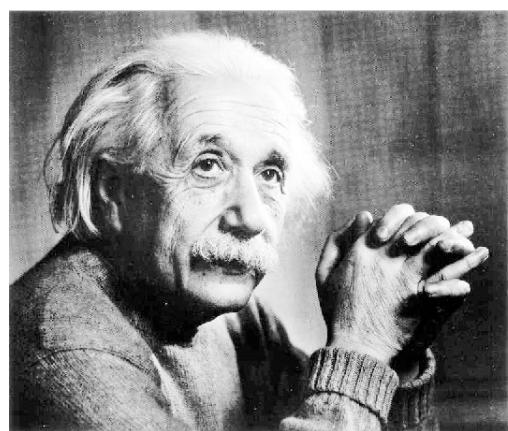


Figure 5(b)

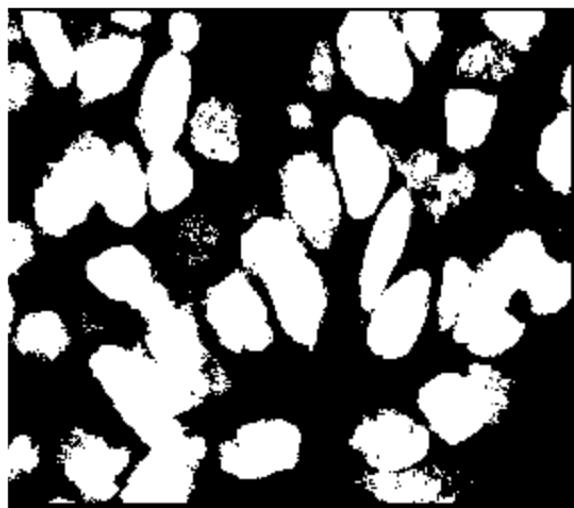


Figure 6(a)

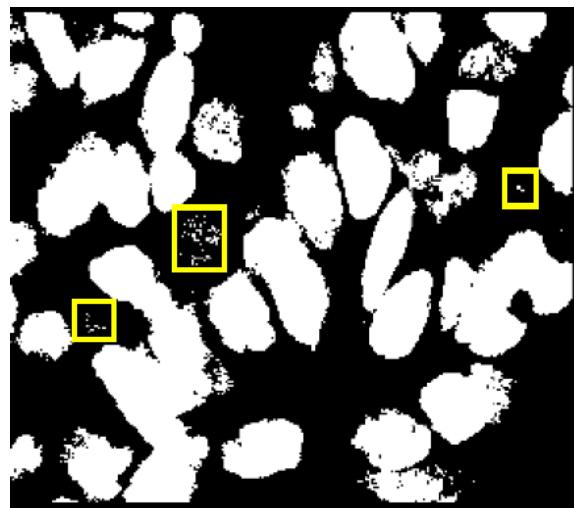


Figure 6(b)



Figure 7(a)

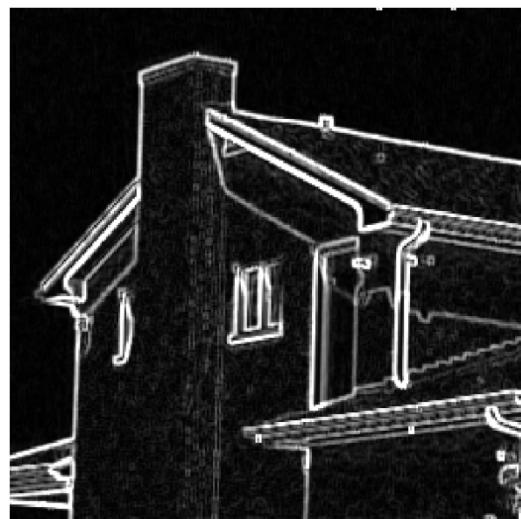


Figure 7(b)

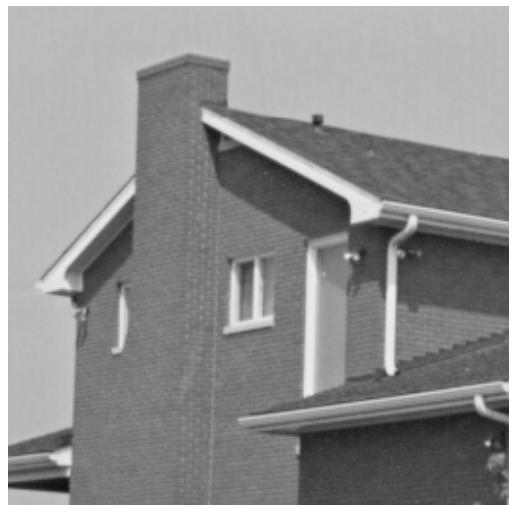


Figure 8(a)



Figure 8(b)



Figure 8(c)

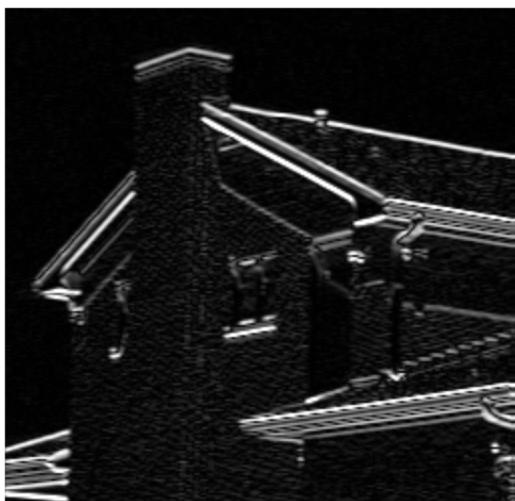


Figure 8(d)



Figure 8(e)



Figure 9(a)



Figure 9(b)



Figure 10(a)



Figure 10(b)

Hints:

1. Histogram processing

$$h(r_k) = n_k$$

2. Histogram equalization

$$s_k = T(r_k) = \frac{(L-1)}{MN} \sum_{j=0}^k n_j$$

3. Image negative

$$\mathbf{s} = \mathbf{L}-\mathbf{1}-\mathbf{r}$$

4. Power-law transformation

$$S = cr^\gamma$$

5. Gray-level slicing with background

$$s = \begin{cases} L, & A \leq r \leq B \\ r, & \text{Otherwise} \end{cases}$$

6. Gray-level slicing without background

$$s = \begin{cases} L, & A \leq r \leq B \\ 0, & r = 0 \end{cases}$$

7. Contrast stretching

$$s = \begin{cases} (s_2 - s_1)/(r_2 - r_1) * (r - r_1) + s_1, & \text{if } r_1 \leq r < r_2 \\ r, & \text{otherwise} \end{cases}$$