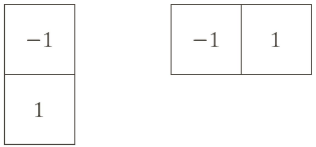
Kenar Yakalama

Edge detection

Kenar Maskeleri: Robert, Sobel

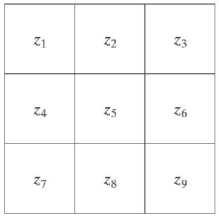


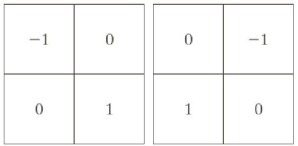
a b

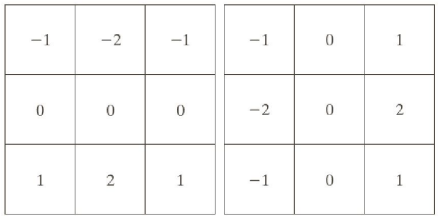
FIGURE 10.13
One-dimensional masks used to implement Eqs. (10.2-12) and (10.2-13).

Tek boyutlu

Çift boyutlu







a
b c
d e

FIGURE 3.41
A 3 × 3 region of an image (the zs are intensity values). (b)–(c) Roberts cross gradient operators. (d)–(e) Sobel operators. All the mask coefficients sum to zero, as expected of a derivative operator.

$$g_x = (z_9 - z_5) \quad \text{and} \quad g_y = (z_8 - z_6)$$

$$M(x, y) = \left[(z_9 - z_5)^2 + (z_8 - z_6)^2\right]^{1/2}$$

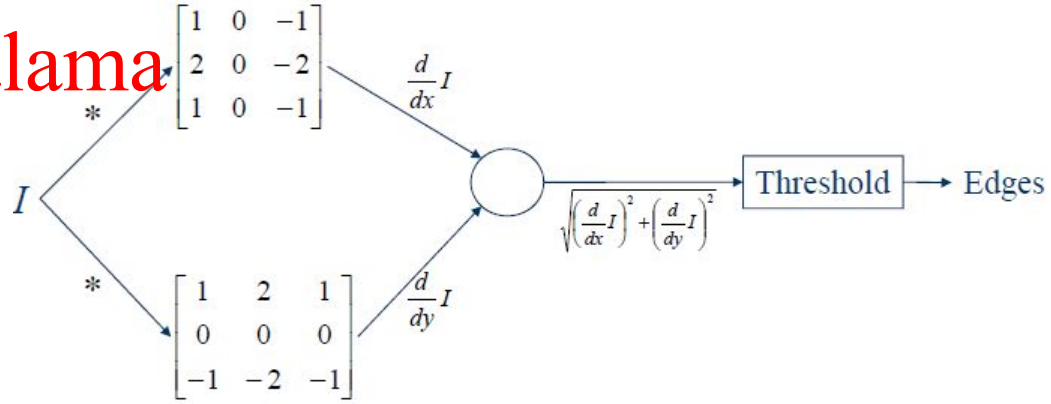
$$M(x, y) \approx |z_9 - z_5| + |z_8 - z_6|$$

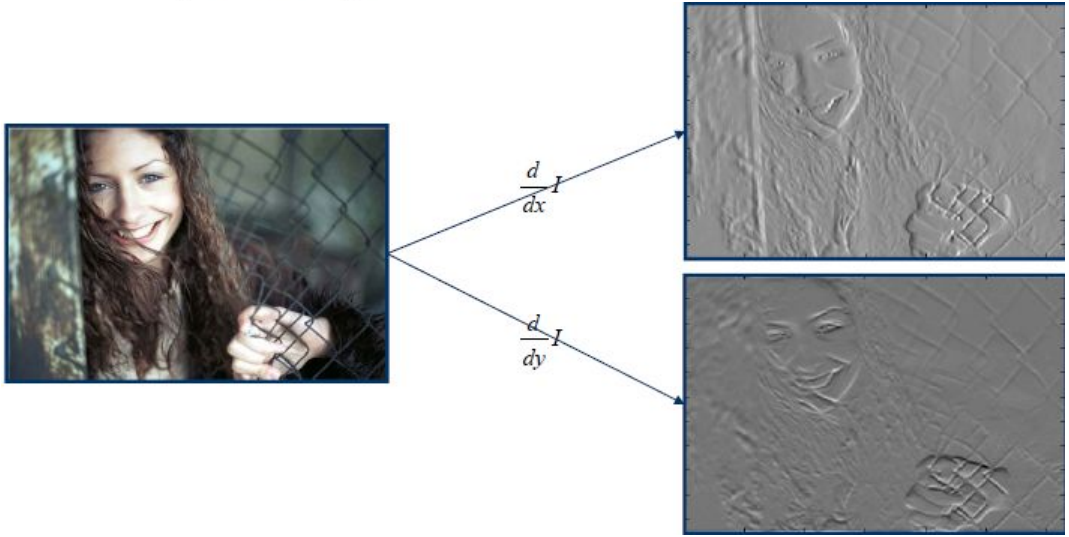
$$g_x = \frac{\partial f}{\partial x} = (z_7 + 2z_8 + z_9) - (z_1 + 2z_2 + z_3)$$

$$g_y = \frac{\partial f}{\partial y} = (z_3 + 2z_6 + z_9) - (z_1 + 2z_4 + z_7)$$

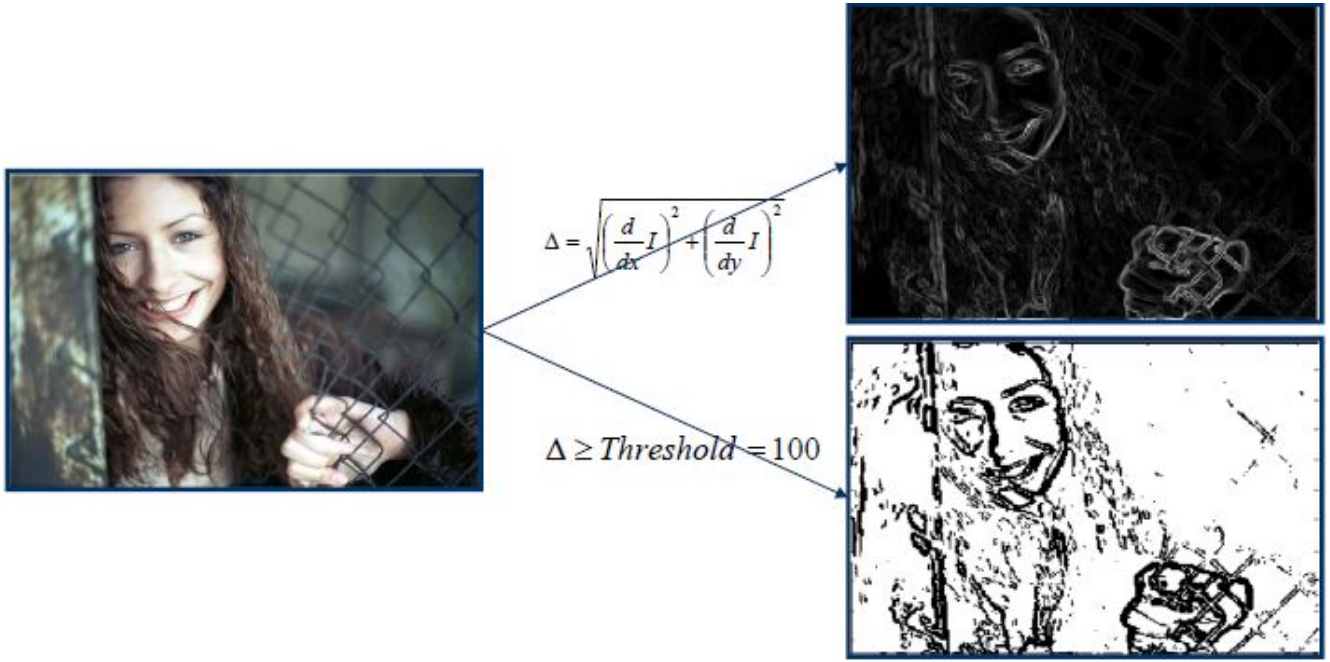
$$M(x, y) \approx |(z_7 + 2z_8 + z_9) - (z_1 + 2z_2 + z_3)| + |(z_3 + 2z_6 + z_9) - (z_1 + 2z_4 + z_7)|$$

Sobel Kenar Yakalama

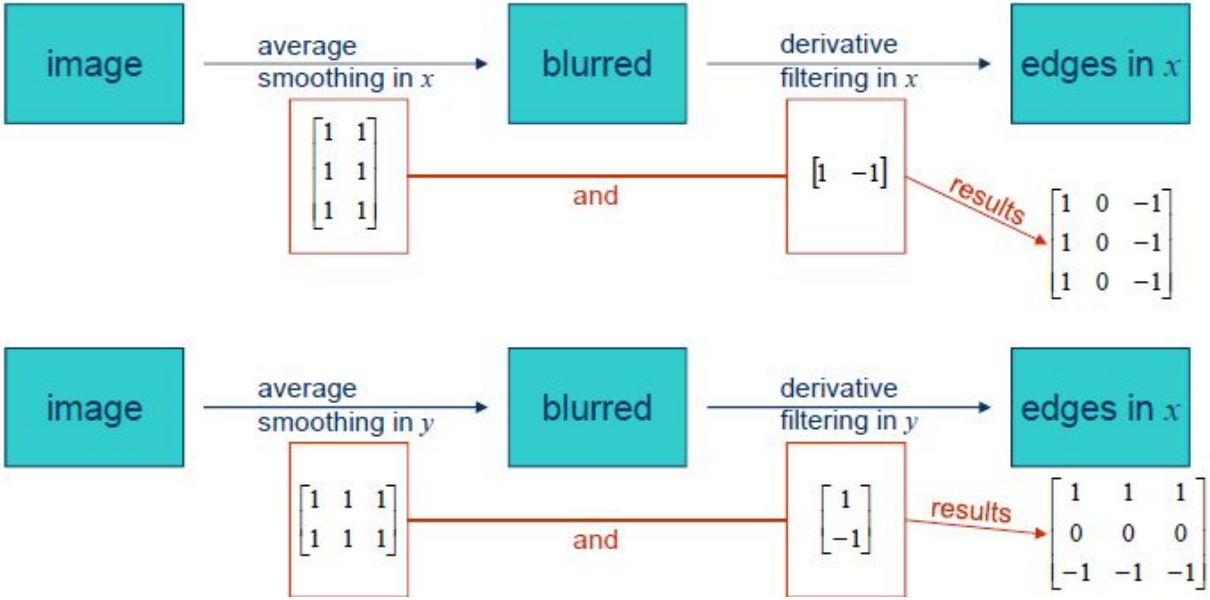




Sobel Kenar Yakalama



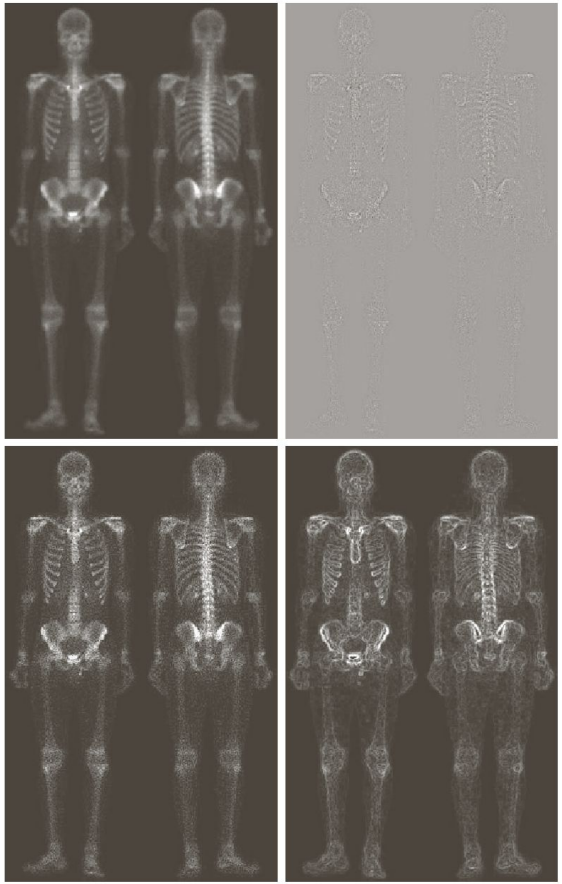
Prewitt Kenar Yakalama



Kapsayıcı Bir Örnek

Bu uygulamada (a) daki kemikleri görünen, fakat yumuşak dokusu görülmeyen insanın bütün vücut siluetinin ortaya çıkarılmasını sağlayacağız.

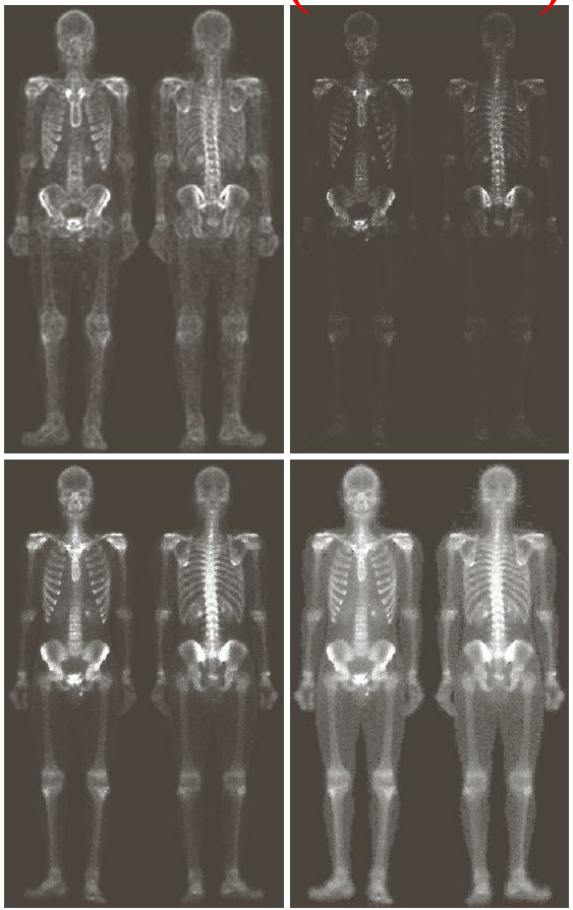
Unutmayalım ki;
Birinci türev (gradyan) ana kenarların güçlenmesinde, ikinci türev (laplacian) ise ince (detay) kenarların ortaya çıkarılmasında kullanılmaktadır.



a b
c d

FIGURE 3.43
(a) Image of whole body bone scan.
(b) Laplacian of (a). (c) Sharpened image obtained by adding (a) and (b).
(d) Sobel gradient of (a).

Kapsayıcı Bir Örnek (devam)



e f
g h

FIGURE 3.43
(Continued)
(e) Sobel image smoothed with a 5×5 averaging filter. (f) Mask image formed by the product of (c) and (e).
(g) Sharpened image obtained by the sum of (a) and (f). (h) Final result obtained by applying a power-law transformation to (g). Compare (g) and (h) with (a). (Original image courtesy of G.E. Medical Systems.)