One of the most basic and important convolutions is the computation of derivatives (or

approximations to them). Th ere are many ways to do this, but only a few are well suited

to a given situation.

In general, the most common operator used to represent diff erentiation is the Sobel de

rivative [Sobel68] operator (see Figures 6-3 and 6-4). Sobel operators exist for any order of derivative as well as for mixed partial derivatives (e.g., ∂ ∂ ∂ 2

/ x y).

Figure 6-3. Th e eff ect of the Sobel operator when used to approximate a fi rst derivative in the

x-dimension

cvSobel(

const CvArr\* src,

CvArr\* dst,

int xorder,

int yorder,

int aperture\_size = 3

);

Here, src and dst are your image input and output, and xorder and yorder are the orders

of the derivative. Typically you’ll use 0, 1, or at most 2; a 0 value indicates no derivative

Figure 6-4. Th e eff ect of the Sobel operator when used to approximate a fi rst derivative in the

y-dimension

Here, src and dst are your image input and output, and xorder and yorder are the orders

of the derivative. Typically you’ll use 0, 1, or at most 2; a 0 value indicates no derivative