Chapter 3
Approaches for M–Health Environment

ABSTRACT

It is a well-known fact that when a camera or other imaging system captures an image, often, the vision system for which it is captured cannot implement it directly. There may be several reasons behind this fact such as there can exist random intensity variation in the image. There can also be illumination variation in the image or poor contrast. These drawbacks must be tackled at the primitive stages for optimum vision processing. This chapter will discuss different filtering approaches for this purpose. The chapter begins with the Gaussian filter, followed by a brief review of different often used approaches. Moreover, this chapter will also render different filtering approaches including their hardware architectures.

GAUSSIAN FILTER

The use of the Difference of Gaussian (DoG) or Gaussian Filter has widely been used for varying purposes. In this approach, the moving window technique is often implemented for the local neighborhood window. In figure 1, the design of hardware architecture has been delineated for a 3x3 moving window. The following are the important steps of this technique.

Step 1. Gaussian filter or median filter
**Step 2.** Buffer
Step 3. Local neighborhood window
Step 4. Image processing technique

In this technique, the image pixels are given as input, and subsequently, it is processed using a Gaussian filter or median filter. Another suitable technique can also be used for this purpose. Further, buffers are used for shifting the image pixels within the correct local neighborhood window. After encapsulating the genuine pixels by the local neighborhood window, image processing techniques can be used for producing the output.

Figure 1. Hardware architecture of a 3x3 moving window
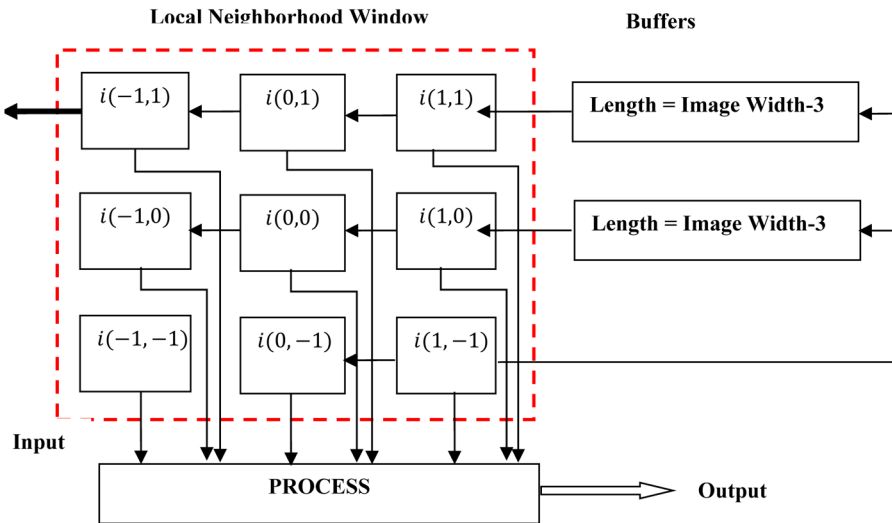
An extensive literature survey reveals the fact that different researchers have widely used this approach. In (Rao et al., 2006), a moving window is used along with a Gaussian filter in the hardware architecture. Moreover, the architecture is given in (Rao et al., 2006) also utilizes a controller that controls the flow of data from and to the buffers. In addition, a multiport block RAM is also used to implement the circular buffering. Further, in (Zhang et al., 2007), the multi-window partial buffering scheme is used for two-dimensional convolution techniques on FPGA. In this technique, parallel processing of

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