International Journal of Applied
and Natural Sciences (IJANS)
ISSN(P): 2319-4014; ISSN(E): 2319-4022
Vol. 5, Issue 2, Feb - Mar 2016; 35-56

International Academy of Science,
Engineering and Technology
Connecting Researchers; Nurturing Innovations

DIGITAL LOW-PASS FILTERS WITH MILDER LOW-PASS EFFECT ON DIGITAL IMAGES

ISSA.A.AL-SHAKHRAH

Professor of Medical Physics, Department of Physics, University of Jordan, Amman, Jordan

ABSTRACT

Image filtering consists of modifying the original image by logically "reimaging" it with a mathematical imaging device in which spatial response can be controlled by the user**.** Image filtering is performed by a mathematical operation called convolution, which is simply the successive replacement of each point in the original image by a new value produced by a weighted combination of the original point and its surrounding neighbour points. Filtering generally requires definition of a filtering kernel or small matrix; often a few filtering kernels are predefined in imaging computer systems. The filtering kernel is generally square with a matrix size of 3 x 3 pixels, 5 x 5 pixels or 7 x 7 pixels. Nine spatial low-pass filters (masks) are developed, then implemented and tested in our laboratory by using programs that were written in Borland c^{++} and visual FORTRAN. The results of the application of the developed low-pass digital filters (masks) on digital images (smoothing, attenuates image noise, edge enhancement and increasing the contrast (sharpening) of fine details regions), comparing between the effect of different dimensions filters (3x3 and 5x5), and milder low pass effect are presented and demonstrated. As the size of the filter (mask) gets larger, and/or the weight of the centre pixel of the kernel get higher, the effect of the mask on the input image becomes more and more.

KEYWORDS: Low-Pass Digital Filters, Milder Low-Pass Effect and Unsharp Masking Enhancement