

LOW PASS CONVOLUTION FILTERS AS A TOOL FOR TONAL IMAGE ENHANCING

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This work presents the results of a methodological study, which led to the development of low pass convolution filters. Such filters enable the enhancement of the tonal information of an image, which is related to spectral responses in the case of optical remote sensing. The technique is based on the concept that, since high pass filtering excludes the tonal information, it must remain in the high pass filtering residue, related to low frequencies. Initially, high pass filters were developed whose values, assigned to operator cells, were weighted as a function of the distance of each cell to the operator center. From these filters low pass filters were elaborated by the subtraction method. Both filters were applied to a simple image, a digitized photography of candlelight, to evaluate the relating effects and relate them to edge features or tonal information. The filters behavior was evaluated also in a TM Landsat image from Rio Grande do Sul State, Brazil. In the image of candlelight, it can be observed that the application of low pass filters enhances the tonal information on each band (red, green and blue), producing a better view of the different flame's temperature zones, indicating that the effects produced by the filtering process are effectively related to the real information present in the original image. As well as in the image of candlelight, the processed TM Landsat image shows the enhancement of tonal information, related to natural features presents in the studied area.