4. CONCLUSION

A novel algorithm has been proposed to eliminate blurring of images for large window sizes and poor impulse noise removal for small window sizes which are commonly encountered in SMF. The proposed algorithm makes use of 3X3 window for all noise densities using the neighborhood pixels to be processed in the current window considered for processing. This eliminates the complexity of existing adaptive median filter, progressive switched median filter and Chan-Nikolova method. The Srinivasan and Ebenezar method makes use of all nine inputs for the evaluation of median values this hampers the processing speed of the existing algorithms, as the evaluating procedure has to wait for the previous stage comparison output. This drawback is overcome by the proposed algorithm since the median value is computed only if the pixel to be processed is noisy. The proposed algorithm eliminates the need for nine inputs by replacing six, five, four, three inputs in successive stages for the computation of the median. This makes the proposed algorithm much faster when compared the existing decision based algorithms. In the case of existing decision based filters the process of decision making becomes quite complex when the evaluated median is found to be noisy. This complexity is eliminated in the proposed algorithm by finding out the uncorrupted pixel in the current window considered and replacing the current pixel to be processed with the mean of the uncorrupted pixels in the given window. The use of this linear operation does not hamper the non linearity of the proposed algorithm, which is the phenomenon for effective removal of impulse noise. All these advantages make the proposed filter to perform consistently for varying noise densities from 5% to 95% with fixed window of size 3X3. The novel sorting technique used in the proposed algorithm reduces the computational time, which is 1.5 times less than the existing decision based algorithm and other adaptive algorithm and reduced by the factor of 150 to 200 compared with the two-phase algorithm. The algorithm was implemented on images corrupted by both, fixed impulse noise (MATLAB inbuilt function) and random impulse noise (which are added manually). The proposed method removes the noise effectively even at noise level as high as 85% and preserves the edges without any loss up to 80% noise levels. The proposed algorithm is tested on different images and is found to produce better results in terms of the qualitative and quantitative measures of the image, as compared to SMF, AMF, TDF, CWMF and modified decision based filter, even at noise densities as high as 85%.

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