

One of most challenging problems in image processing is edge-preserving noise removal, because edges deliver most important information to the human visual system. The article is concerned with efficient numerical techniques for edge-preserving noise removal, solving nonlinear partial differential equations. A new minimum-biased anisotropic diffusion (MinBAD) algorithm is introduced to efficiently eliminate the noise and to minimize diffusion on both the piecewise smooth portions and their boundaries. It has been numerically verified that MinBAD eliminates, rather than diffuses, the noise and shows great properties in image restoration. It is compared with various median filters. MinBAD turns out to be better than most median filters and an optimal performance is observed when the permutation center weighted median filter is adopted as a post-processor of MinBAD.