A new method is proposed to estimate corruption function inverse of a blurred image. This technique can be used for restoring similar corrupted images. For linear position invariant procedure, the corruption process is modeled in the spatial domain by convolving the image with a point spread function (PSF) and addition of some noises into the image. It is assumed that a given artificial image is corrupted by a degradation function, represented by the PSF, and an additive noise. Then a filter mask (as a candidate for the corruption function inverse) is calculated to restore the original image from the corrupted one, with some accuracy. Calculating a suitable filter mask is formulated as an optimization problem: find optimal coefficients of the
filter mask such that the difference between the original image and filter mask restored image to be minimized. Particle swarm optimization (PSO) is used to compute the optimal coefficients of the filter mask. Square filter masks are considered. A comparison between different exciting methods and the proposed technique is done using simulations. The simulation results show that the proposed method is effective and efficient. Since the proposed method is a simple linear technique, it can be easily implemented in hardware or software.

Reference


Index Terms

Computer Science

Signal Processing

Key words

Corruption Function

Filter Mask

Image Restoration

Particle Swarm

Optimization