Arbitrarily Shaped Blur Kernel Estimation for Single Image Blind Deblurring

Authors : Aftab Khan, Ashfaq Khan

Abstract : The research paper focuses on an interesting challenge faced in Blind Image Deblurring (BID). It relates to the estimation of arbitrarily shaped or non-parametric Point Spread Functions (PSFs) of motion blur caused by camera handshake. These PSFs exhibit much more complex shapes than their parametric counterparts and deblurring in this case requires intricate ways to estimate the blur and effectively remove it. This research work introduces a novel blind deblurring scheme visualized for deblurring images corrupted by arbitrarily shaped PSFs. It is based on Genetic Algorithm (GA) and utilises the Blind/Reference-less Image Spatial QUality Evaluator (BRISQUE) measure as the fitness function for arbitrarily shaped PSF estimation. The proposed BID scheme has been compared with other single image motion deblurring schemes as benchmark. Validation has been carried out on various blurred images. Results of both benchmark and real images are presented. Non-reference image quality measures were used to quantify the deblurring results. For benchmark images, the proposed BID scheme using BRISQUE converges in close vicinity of the original blurring functions.