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Subpixel-Shifted Images Super-Resolution Reconstruction using Registration by SFME

Abstract:

The subpixel-shifted (SPS) images acquisition method based on imaging
system has the limitations of complex structure, difficult production and high cost.
Therefore,an image super-resolution reconstruction method based on registration is
proposed. In the first phase, the registration algorithm is used to select the SPS
images. In order to improve the accuracy of the registration algorithm, a registration
algorithm combining SIFT-FLANN and misregistration points elimination (SFME)
is proposed. In the second phase, an interpolation of nonuniformly spaced samples
based on pixel gray correction is proposed to get the high resolution (HR) image.
Experiments show that the images selection method can obtain higher-precision SPS
images, and the reconstruction method can reconstruct HR image with better visual
and higher spatial resolution. Finally, the image magnification factor and the number
of SPS images used in the reconstruction process are analyzed to describe the
practical application value of the methods proposed.