Generation of distorted SCIs in the SIQAD

Seven distortion types with seven distortion levels:

1. Gaussian Noise (GN): distorted images are generated by the MATLAB function ‘imnoise’ with zero mean. The standard deviation is set from 0.02 to 0.24: 0.02, 0.04, 0.06, 0.1, 0.14, 0.18 and 0.24.
2. Gaussian Blurring (GB): blurred images are obtained by implementing the MATLAB function ‘imfilter’ with Gaussian kernel. Size of the Gaussian kernel is 7 by 7, and the standard deviation is set to 0.58, 0.68, 0.76, 0.96, 1.2, 1.8 and 2.4.
3. Motion Blurring (MB): motion blur is added to images by using the MATLAB function ‘imfilter’ with the motion kernel that approximates the linear motion of a camera. Two parameters ‘len’ and ‘theta’ are set to control the blurring level.

Len: linear motion of a camera by ‘len’ pixels;

Theta: an angle degree in a counterclockwise direction.

Here, ‘len’ is set to [3, 3.4, 3.6, 4, 4.8, 6, 9], and ‘theta’ is zero.

1. Contrast Change (CC): MATLAB function ‘imadjust’ is used to change contrast of test images. The contrast changes are listed as follows. Left is the scale of original image, and right is the scale of contrast changed image.

[ ] to [0.3, 0.5], [ ] to [0.1, 0.7], [0.1, 0.8] to [0.1, 0.9], [0.2, 0.8] to [0.1, 0.8], [0.1, 0.6] to [0.1, 0.8], [0.2, 0.6] to [0.1, 0.8], [0.2, 0.7] to [ ].

1. JPEG compression: the JPEG is implemented via MATLABs imwrite function. The quality factor is set to [75, 55, 48, 32, 25, 18, 13].
2. JPEG2000 compression: MATLAB function ‘imwrite’ is also used to generated images compressed by JPEG2000. The compression factor is set to [20, 28, 32, 40, 46, 54, 65].
3. Layer-Segmentation based Compression (LSC): we change the classification index map artificially. Some textual blocks are randomly misclassified to pictorial regions with misclassification ratio ranging from 40% to 80%. Quantization factor is set to [10, 8, 7, 6, 5, 4, 3] for the textual layer, while the pictorial layer is gradually of better quality (with the quality factor of JPEG equally spaced from 15 to 60).