NTIRE 2025 Challenge on Night Photography Rendering — Supplementary Material —

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A. Image alignment

In order to calculate pixel-wise metrics such as SSIM and PSNR, both Sony and Huawei images need to be aligned. Images from Huawei were used after processing because raw ones exhibit visible distortions, making alignment impossible.

The alignment process consisted of two stages. First, we identified best-matching patches of two images using the following steps: set both images to have the similar size; crop the middle patch from the Huawei image; find the matching Sony patch with the highest Pearson correlation; extend the boundaries of the crop to maximize the area of the aligned pair.

Next, it was necessary to solve projection problems. To achieve this, for each batch (about 100 images) we computed RANSAC transform matrices for Sony images. Then, for each Sony image, we selected the best image matrix that maximizes the Pearson correlation. Finally, we trimmed the edges of both images to remove RANSAC transform black areas and beam-splitter cube artifacts.

The algorithm produces a transformed and aligned Sony image as well as crop coordinates for the Huawei image. Participants had to address distortion and then apply the crop coordinates to the pre-processed image.