

Deep Image Compression using Decoder Side Information

Sharon Ayzik and Shai Avidan

Dept. of Electrical Engineering
Tel Aviv University

ayziksha@mail.tau.ac.il , avidan@eng.tau.ac.il

Supplementary Material

Dataset examples: Examples for both datasets can be seen in Figure 1, where the top pair is an example from *KITTI Stereo*, and bottom pair is an example from *KITTI General*. In each pair, the top image is an example for X image, and below it, its matching side information image Y . While *KITTI stereo* images present the same scene from a slightly different angle, *KITTI General* images contain the same objects but in different scales and angles as well as objects that appear in one image but not on its matching pair.

2D Gaussian mask: As mentioned in the main paper’s ablation study, we found it beneficial to add a 2D Gaussian mask as a prior in the process of creating Y_{syn} . In Figure 2 we present an example for a correlation map created for a certain patch of X_{dec} by following our method of patch selection as mentioned in the main paper. Furthermore, we compare correlation maps created with and without the use of a 2D Gaussian mask and show their selected matching patches (i.e., patches that yield maximum correlation) marked in Y image. We can see that the 2D Gaussian mask focuses the attention on the more relevant patches.

Reconstruction examples: In the next pages, we share additional visual examples for both datasets - *KITTI Stereo* and *KITTI General* compared to the baseline model, BPG, and JPEG 2000. For the other codecs, we chose the reconstruction results with the smallest bpp above ours. When very low bpp is applied, we compare ourselves only with the baseline model since BPG failed to reach these bpps.

By observing the results, we can see that JPEG 2000 yields very blurry images, while BPG restores coarse edges well but lacks in textures and fine details. Our model succeeds in restoring edges as well as fine features and textures. When comparing our model with the baseline model, our method does a better job in restoring objects, textures, and colors.

KITTI Stereo*KITTI General*

Fig. 1: Examples from both datasets. Both examples present the same X (top image in each pair), while the side information Y is taken according to the dataset's settings. Top pair - *KITTI Stereo* - the different angle between images can be seen. Bottom pair - *KITTI General* - in addition to the two cameras different angle, object can appear in different scale (such as the car) and some of the object are missing in the matching pair image (such as the traffic sign).

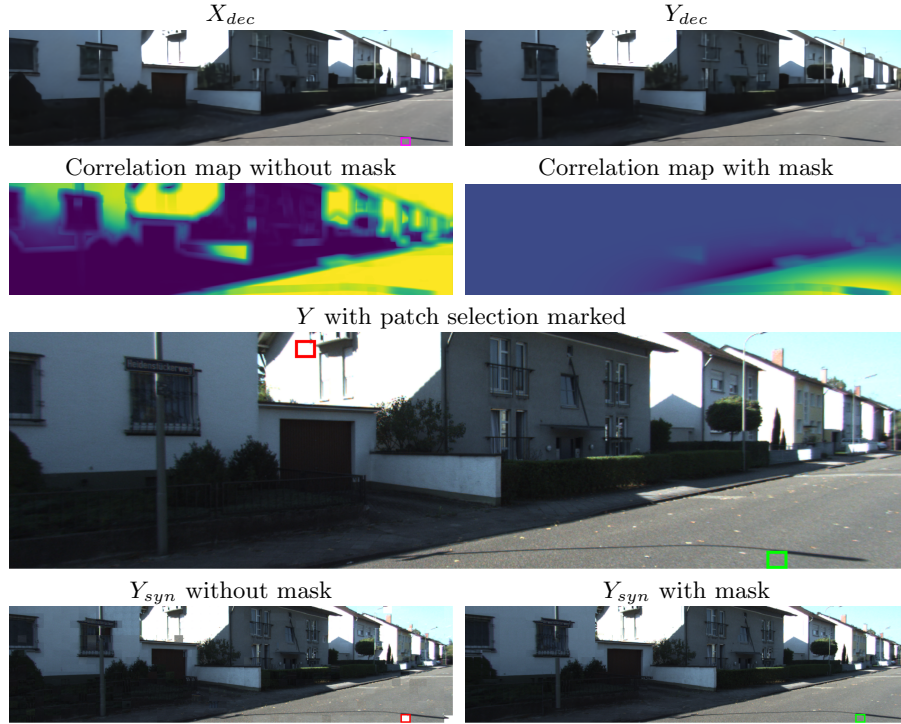


Fig. 2: Top to bottom left to right: X_{dec} image with target patch marked in magenta that is compared to all possible patches in Y_{dec} image (top right) and the output, is the correlation map (second row) with and without 2D Gaussian mask (yellow equals high correlation). Third row, Y image with maximum score patches marked (green patch - when using the mask, red patch - without the mask). Bottom, Y_{syn} image created with and without the use of the 2D Gaussian mask (the matching patches marked - red patch selected without the mask, green patch selected when using the 2D Gaussian mask).



Fig. 3: Reconstruction comparison to the baseline model, JPEG 2000 and BPG over *KITTI Stereo*.



Fig. 4: Our suggested method compared with the baseline model, JPEG 2000, and BPG over *KITTI Stereo*.



Fig. 5: Reconstruction comparison to the baseline model, JPEG 2000 and BPG over *KITTI General*.

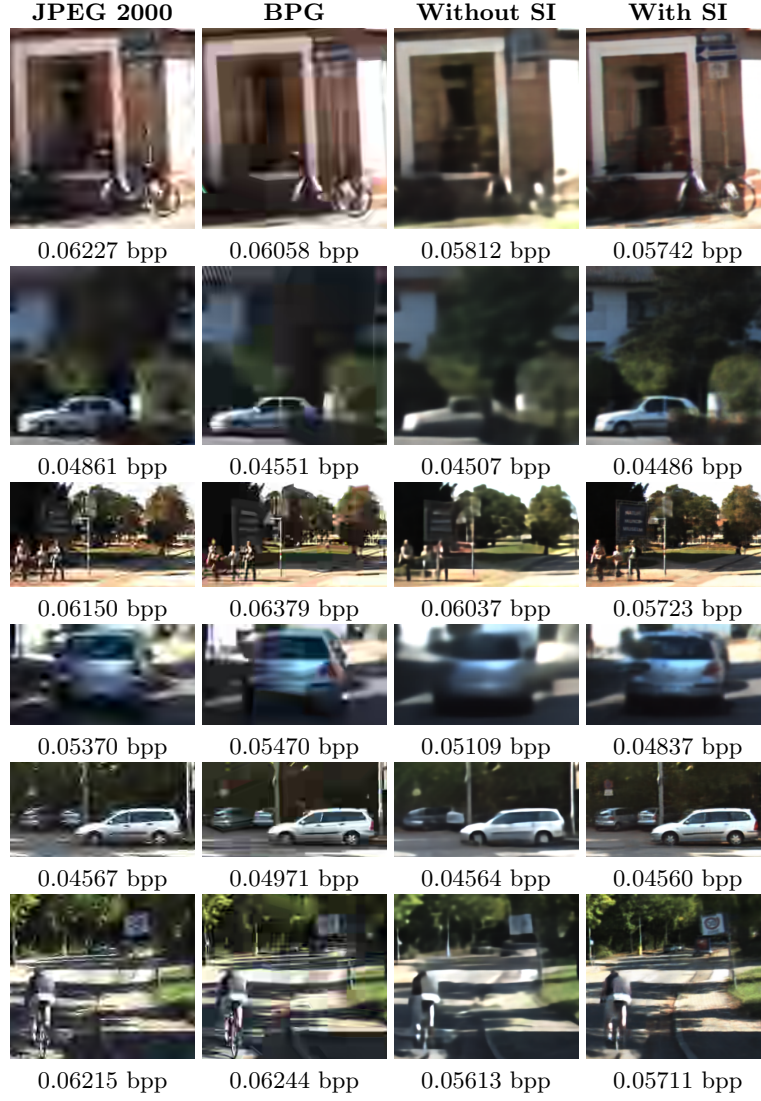


Fig. 6: Our suggested method compared with the baseline model, JPEG 2000, and BPG over *KITTI General*.



Fig. 7: Reconstruction comparison in low bit rates (that BPG failed to reach) over *KITTI Stereo* with and without side information.



Fig. 8: Reconstruction comparison in low bit rates (that BPG failed to reach) over *KITTI General* with and without side information.



Fig. 9: Reconstruction comparison in low bit rates (that BPG failed to reach) over *KITTI General* with and without side information.



Fig. 10: Additional reconstruction comparison in low bit rates (that BPG failed to reach) over *KITTI General* with and without side information.