## 7. Supplementary material

We present some additional qualitative results in this supplementary material. First, we show more examples of our method and more qualitative comparisons with baselines. In addition, we show some examples of when our method fails to recolor. Then, we show the impact of perturbation on different colors. Finally, we discuss the details of quantitative experiments on different colors.

#### 7.1. Results

We demonstrate more examples of our method in Figures 15, 16, 17, 18. Figure 19 and Figure 20 show two examples of when our method fails. In first case, the reflection of dress of the person in another object is not recolored. In second case, because the the hand of the person is not detected, the method does not recolor the whole dress of the person. Figures 21, 22, and 23 show more examples of comparing our method with proposed baselines in our experimental validation section.

#### 7.2. Perturbation of mask and background

Here we show more examples of the results we showed for perturbation. Figure 24 shows how our method works when we perturb the mask. Figure 25 shows more results when we perturb the background image.

### 7.3. Quantitative results

In this section, we describe our quantitative experiments in more details. We choose 200 images in our test set randomly and recolor them to 14 different colors. We evaluate inception score on the real images with no change of color. Next, we evaluate the inception score of when we recolor the object in those images to a target color. We do this for all colors. We compare the inception score for our method with other baselines. Table 2 shows the result with respect to each color.

Another comparison we make is to count the number of objects detected in an image before and after recoloring. The process is as follows: We start from an image, I and recolor it to a target image  $I_t$ . We run our object detection algorithm on both images. We denote the set of detected objects in I, with  $O_I$  and objects in  $I_t$  with  $O_{I_t}$ . We pick objects from  $O_I$  and  $O_{I_t}$  if the detection score corresponding to that object is greater than a threshold S. Finally, we compare the number of detected objects in both sets. The absolute value of difference is added to the total number of mismatched detections. Finally we report the total number of mismatched detections in the whole dataset. Table 3 and Table 4 show the results when setting S = 0 and S = 0.75 respectively.

Table 2. Quantitative: Inception Score

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Target Color	Ours	Adapted [29]	Adapted [9]
No change of Color	$8.75\pm0.71$	$8.75\pm0.71$	$8.75\pm0.71$
Red	$8.30 \pm 1.46$	$8.29 \pm 0.48$	$7.84 \pm 0.98$
Green	$8.31 \pm 1.32$	$7.62\pm0.80$	$7.71\pm0.34$
Blue	$8.31\pm0.84$	$8.27\pm0.48$	$7.79 \pm 1.05$
Yellow	$8.33 \pm 1.44$	$8.42\pm0.72$	$7.75\pm0.29$
Magenta	$8.10\pm0.65$	$8.21 \pm 0.77$	$7.68\pm0.71$
Cyan	$8.00\pm0.59$	$8.12\pm0.60$	$8.27\pm0.67$
Orange	$8.42 \pm 1.37$	$8.00\pm0.76$	$8.06\pm0.44$
Pink	$8.25 \pm 1.32$	$8.42 \pm 1.14$	$7.88 \pm 0.65$
Violet	$8.24\pm0.66$	$8.49 \pm 0.49$	$8.12\pm0.81$
White	$8.53 \pm 1.21$	$8.25\pm0.37$	$8.02\pm0.63$
Black	$8.46\pm0.66$	$8.25\pm0.42$	$7.94 \pm 0.51$
Gold	$8.24 \pm 1.45$	$8.16 \pm 1.01$	$7.81\pm0.07$
Gray	$8.48\pm0.92$	$8.21\pm0.38$	$7.80 \pm 1.05$
Brown	$8.31 \pm 1.31$	$8.42 \pm 1.12$	$8.44 \pm 1.16$
Average	8.31	8.22	7.94

Table 3. Quantitative: Number of mismatched bounding boxes after recoloring

Average	255.36	263.50	334.21
Brown	256	218	316
Gray	260	226	287
Gold	248	245	342
Black	238	217	350
White	282	222	291
Violet	258	293	341
Pink	240	231	337
Orange	234	291	339
Cyan	257	293	339
Magenta	253	291	338
Yellow	241	258	348
Blue	263	293	355
Green	287	299	363
Red	258	312	333
No change of Color	0	0	0
Target Color	Ours	Adapted [29]	Adapted [9]

Table 4. Quantitative: Number of mismatched bounding boxes after recoloring with 0.75% confidence.

Target Color	Ours	Adapted [29]	Adapted [9]			
No change of Color	0	0	0			
Red	80	97	100			
Green	87	104	110			
Blue	96	109	109			
Yellow	96	95	121			
Magenta	84	96	105			
Cyan	86	87	115			
Orange	87	97	108			
Pink	75	75	100			
Violet	75	89	107			
White	75	60	79			
Black	80	56	121			
Gold	86	92	130			
Gray	78	59	92			
Brown	82	74	89			
Average	83.36	85.00	106.14			



Figure 15. Recoloring a vase to different colors. Left is ground truth. Image is from **daffodilred - stock ID #100004797**.



Figure 16. Top left is the original image. Recoloring to different RGB colors. Image is from boryanam - stock ID #100038463.



Figure 17. Top left is the original image. Recoloring to different RGB colors. Image is from **boryanam - stock ID #100038472**.



Figure 18. Top left is the original image. Recoloring to different RGB colors. Image is from svetlanafoto - stock ID #100058095.



Figure 19. Failure case. The reflection of dress was not detected by the mask and the algorithm is not able to recognize that. Top left is the original image. Image is from **producer - stock ID #134781503**.



Figure 20. Failure case. Mask does not cover the hand of the person and the method is not able to generalize. From left to right: The original image, mask, recolored to yellow, recolored to green. Image is from **svetography - stock ID #199770304**.



Figure 21. Comparing our method with the proposed baselines. First row is the original image and detected mask. Second row is our method. Third row is adapted [9]. Last row is adapted [29]. Image is from **allamaistrenko - stock ID #101639333**.



Figure 22. Comparing our method with the proposed baselines. First row is the original image and detected mask. Second row is our method. Third row is adapted [9]. Last row is adapted [29]. Image is from **BRD - stock ID #95198050**.



Figure 23. Comparing our method with the proposed baselines. First row is the original image and detected mask. Second row is our method. Third row is adapted [9]. Last row is adapted [29]. Image is from **khemfoto - stock ID #104131139**.



Figure 24. Perturbation on mask. First row from left to right is the original image, the mask with no perturbation, the mask with 5% perturbation, the mask with 30% perturbation. Second row corresponds with recoloring the image with the mask with no perturbation. Rows 3, 4 and 5 correspond to recoloring the image with the masks with 5%, 10% and 30% perturbation respectively. Image is from **AS Photo Project - stock ID #109730761**.































































Figure 25. Background perturbation 0%, 5%, 10%, 15%, 20%, 25%, 30%. Top left is the original image. Image is from **bokan - stock ID #110692886**.

# 7.4. Attributes

Most of the original images (non-GANs) used in this paper are from Adobe Stock. Here is the list of photo ids and their owners:

Fig. 1: #100036041-solahuddin.

Fig. 2: #100153754-paulovilela.

Fig. 3: #100153754-paulovilela, and #108213415-Alex Tor.

Fig. 5: #100036041-solahuddin.

Fig. 6: #100008804-guas.

Fig. 7: #112111227-FlexDreams, and #111320345-romankosolapov.

Fig. 9: #100177220-Studio KIVI, and #100045692-pedphoto36pm.

Fig. 10: #101639333-allamaistrenko.

Fig. 11: #100133198-Andrey Solovev, #100133206-framefts, and #100134232-Sandra Thiele.

Fig. 12: #104279367-lotosfoto, #101639333-allamaistrenko, #95198050-BRD, and #104131139-khemfoto.

Fig. 13: #109730761-AS Photo Project.

Fig. 14: #110692886-bokan.

Fig. 15: #100004797-daffodilred.

Fig. 16: #100038463-boryanam.

Fig. 17: #100038472-boryanam.

Fig. 18: #100058095-svetlanafoto.

Fig. 19: #134781503-producer.

Fig. 20: #199770304-svetography.

Fig. 21: #101639333-allamaistrenko.

Fig. 22: #95198050-BRD.

Fig. 23: #104131139-khemfoto.

Fig. 24: #109730761-AS Photo Project.

Fig. 25: #110692886-bokan.