Computational Photography Assignment 4

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1 Poisson Solver

1.1 Seamless Cloning

1.1.1 Map Example

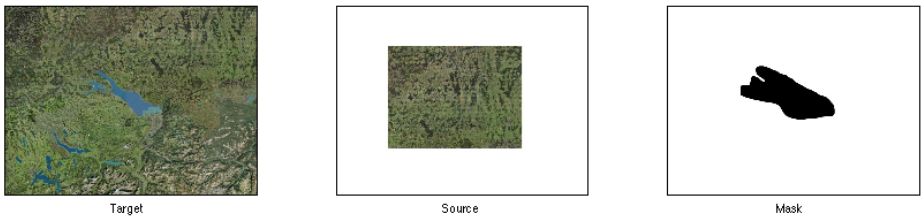

Fig. 1: Visualization of Input images: Target Image is a texture of a Wall (legt), the source image is a scrible (center), and the corresponding mask (right) having a border of 1, everything else is zero.

Fig. 2: Visualization of Gradient field along dx and dy resulting from the gradient mixing gradient field applied on each color channel.

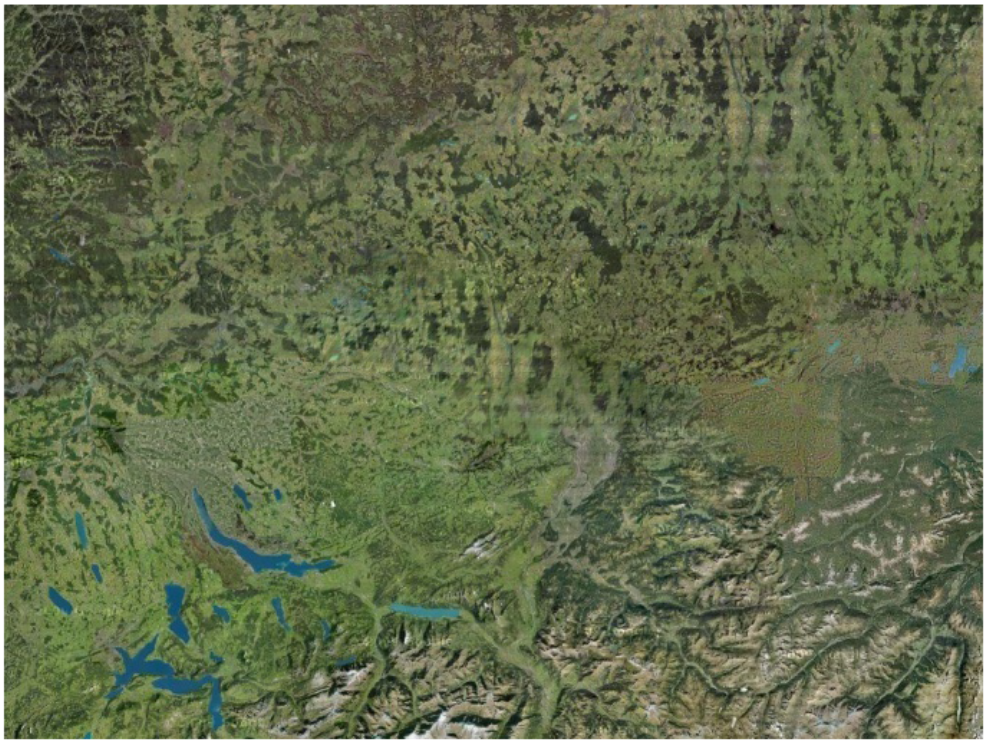

Fig. 3: Output resulting from the gradient mixing method applied on our given input images using the gradient field as shown above.

1.1.2 Plane Example

Fig. 4: Visualization of Input images: Target Image is a texture of a Wall (legt), the source image is a scrible (center), and the corresponding mask (right) having a border of 1, everything else is zero.

Fig. 5: Visualization of Gradient field along dx and dy resulting from the gradient mixing gradient field applied on each color channel.

Fig. 6: Output resulting from the gradient mixing method applied on our given input images using the gradient field as shown above.

1.1.3 Monster Example

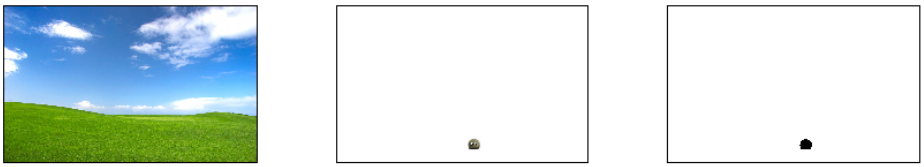

Fig. 7: Visualization of Input images: Target Image is a texture of a Wall (legt), the source image is a scrible (center), and the corresponding mask (right) having a border of 1, everything else is zero.

Fig. 8: Visualization of Gradient field along dx and dy resulting from the gradient mixing gradient field applied on each color channel.

Fig. 9: Output resulting from the gradient mixing method applied on our given input images using the gradient field as shown above.

1.2 Gradient Mixing

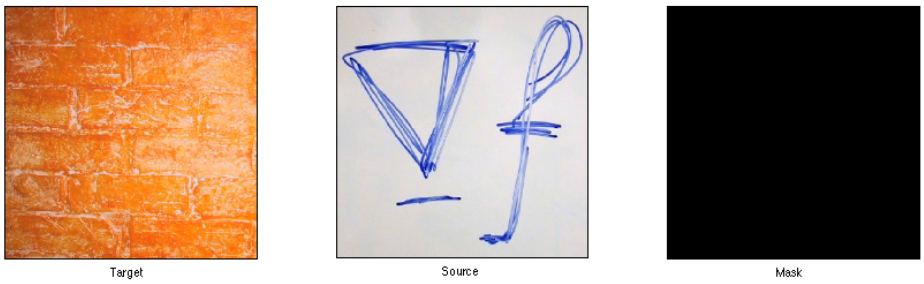

Fig. 10: Visualization of Input images: Target Image is a texture of a Wall (legt), the source image is a scrible (center), and the corresponding mask (right) having a border of 1, everything else is zero.

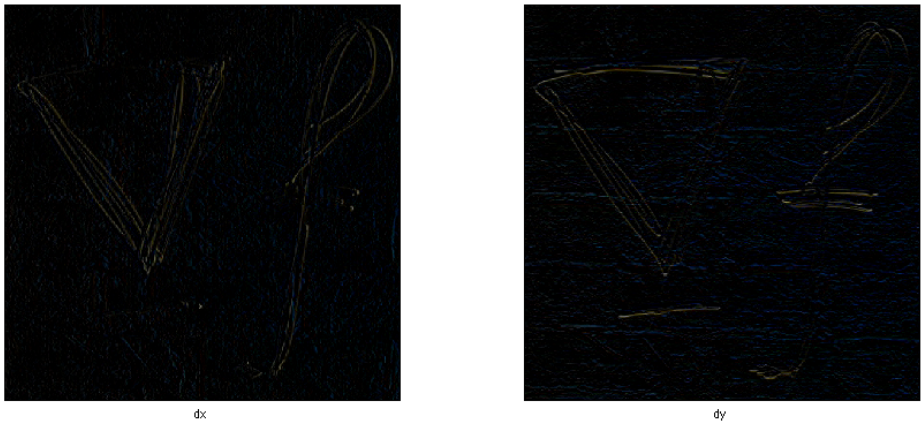

Fig. 11: Visualization of Gradient field along dx and dy resulting from the gradient mixing gradient field applied on each color channel.

Fig. 12: Output resulting from the gradient mixing method applied on our given input images using the gradient field as shown above.

1.3 Highlight Removal

2 Image Segmentation

2.1 Sheep Example

Selection foreground sheep, background grass and some hay in the background gives us quite nice segmentation results.

Fig. 13: Used Input (left) and Selection provided by user (right) whereas a green selection indicates foreground and a blue selection indicates the background.

Fig. 14: On the left the Foreground Mask and on the right the Background mask. For the foreground mask a white regions indicate that such a region should be interpreted as foreground. Similarly for the background mask.

Fig. 15: On the left the foreground mean colors and on the right the mean background colors.

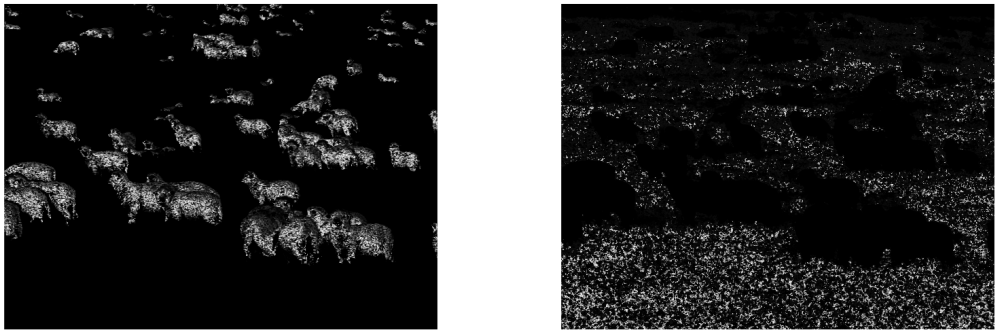

Fig. 16: On the left the probability a pixel belongs to the foreground and on the right the probability a pixel belongs to the background. The whiter the higher the probability is.

Fig. 17: Illustration of the smoothness term.

Fig. 18: The segmentation of the image: On the left the Foreground image and on the right the background image

2.2 Zebra Example

Selection foreground sheep, background grass and some hay in the background gives us quite nice segmentation results.

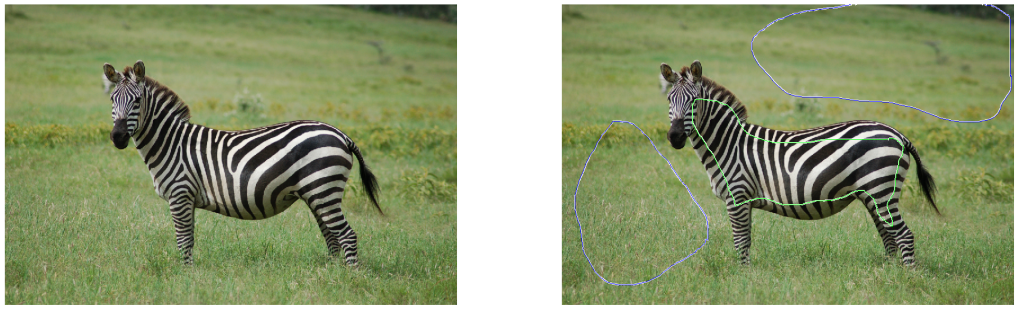

Fig. 19: Used Input (left) and Selection provided by user (right) whereas a green selection indicates foreground and a blue selection indicates the background.

Fig. 20: On the left the Foreground Mask and on the right the Background mask. For the foreground mask a white regions indicate that such a region should be interpreted as foreground. Similarly for the background mask.

Fig. 21: On the left the foreground mean colors and on the right the mean background colors.

Fig. 22: On the left the probability a pixel belongs to the foreground and on the right the probability a pixel belongs to the background. The whiter the higher the probability is.

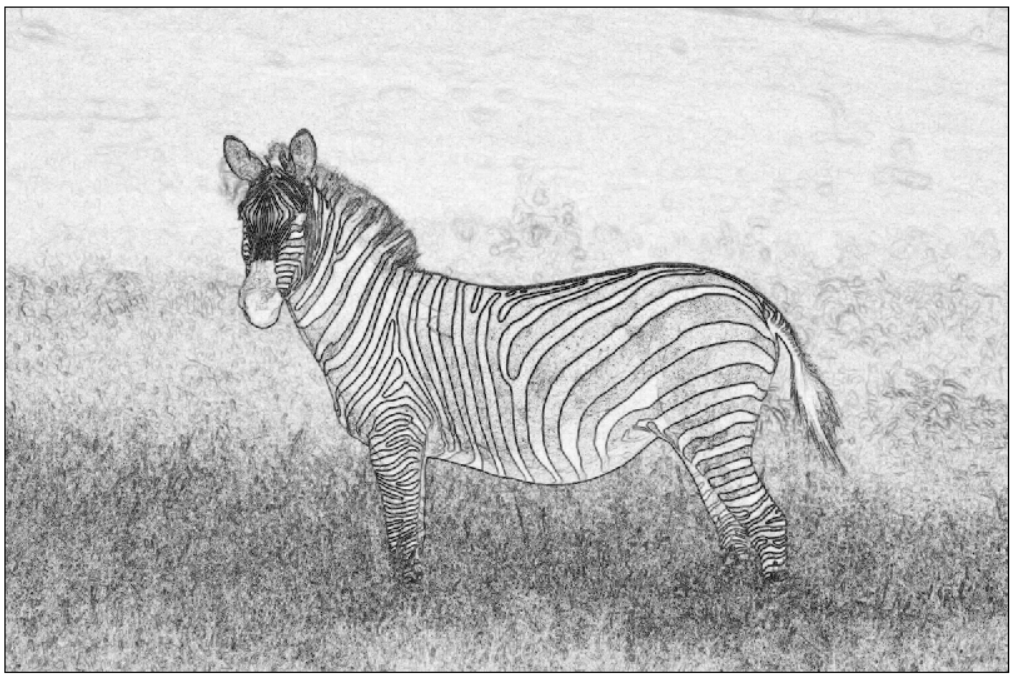

Fig. 23: Illustration of the smoothness term.

Fig. 24: The segmentation of the image: On the left the Foreground image and on the right the background image

2.3 Second Zebra Example

Selection foreground sheep, background grass and some hay in the background gives us quite nice segmentation results.

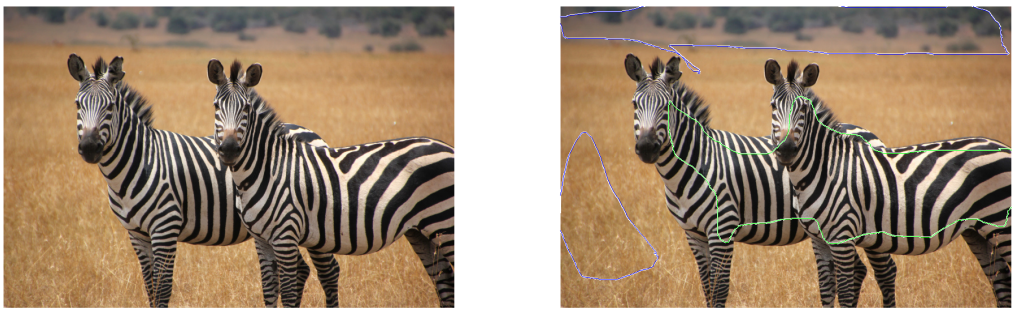

Fig. 25: Used Input (left) and Selection provided by user (right) whereas a green selection indicates foreground and a blue selection indicates the background.

Fig. 26: On the left the Foreground Mask and on the right the Background mask. For the foreground mask a white regions indicate that such a region should be interpreted as foreground. Similarly for the background mask.

Fig. 27: On the left the foreground mean colors and on the right the mean background colors.

Fig. 28: On the left the probability a pixel belongs to the foreground and on the right the probability a pixel belongs to the background. The whiter the higher the probability is.

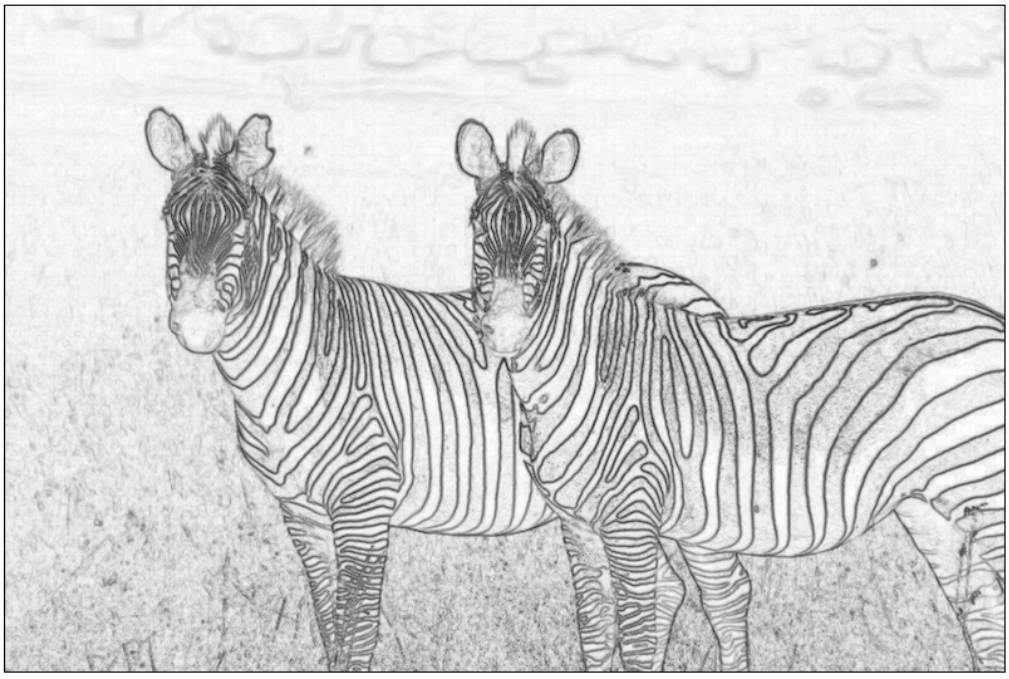

Fig. 29: Illustration of the smoothness term.

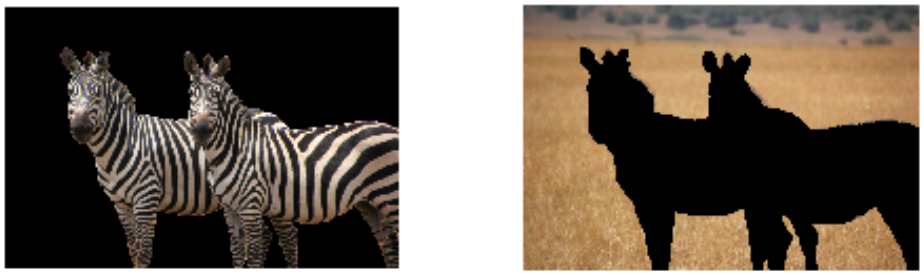

Fig. 30: The segmentation of the image: On the left the Foreground image and on the right the background image