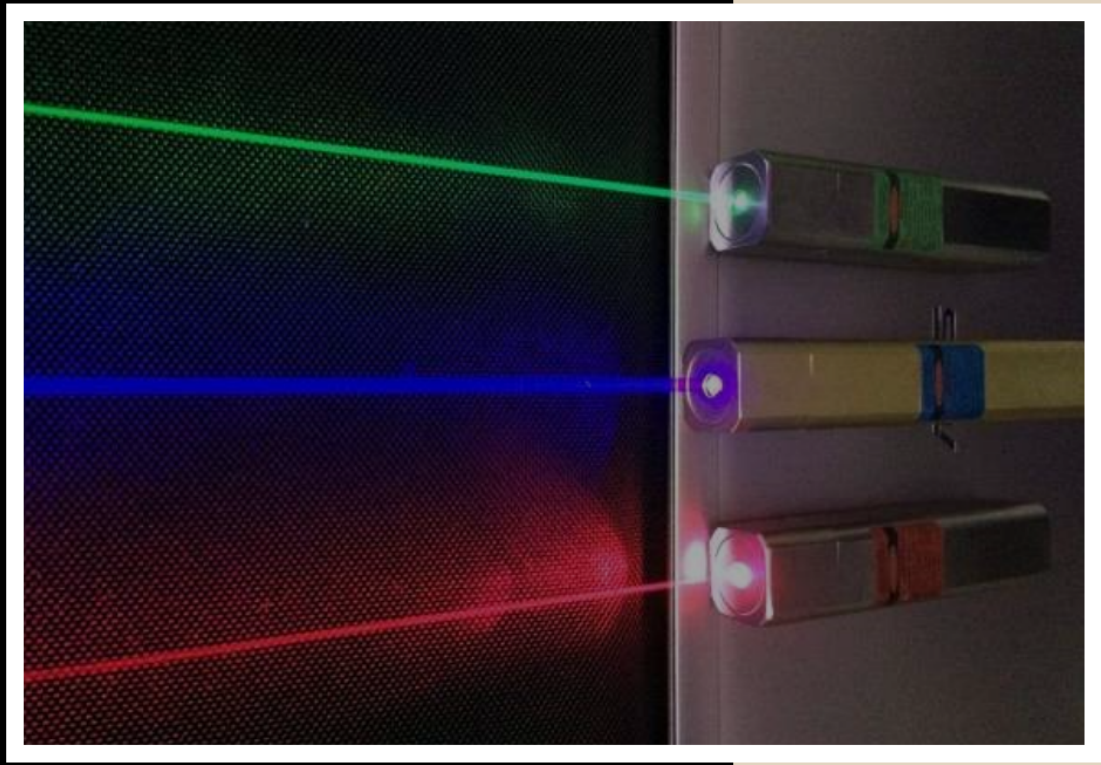
Sobel Edge Detection with Mathematical Morphology



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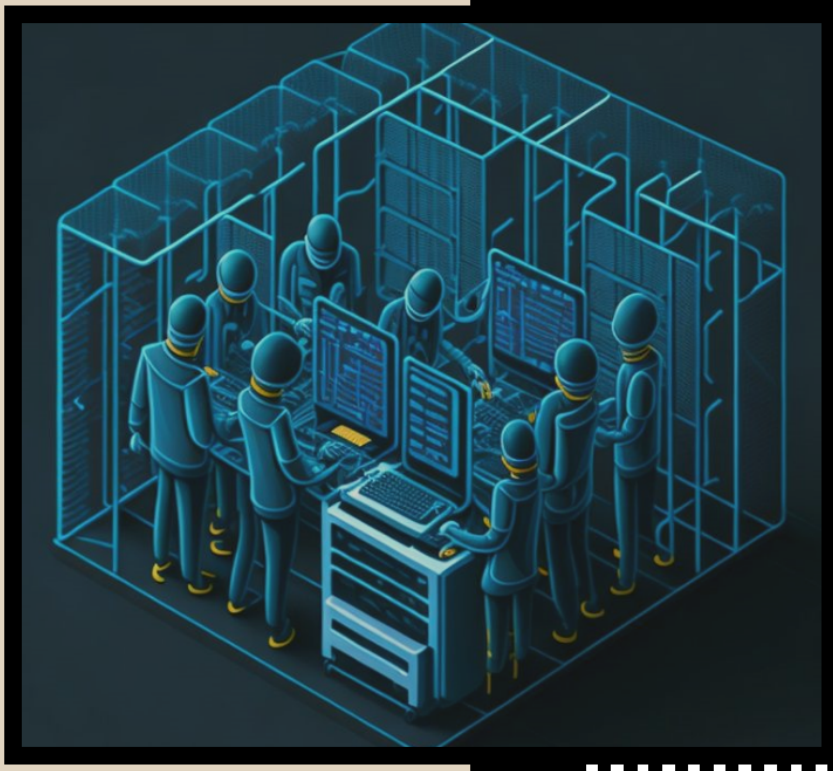
• Dataset

The Berkeley Segmentation Data Set 500 (BSDS500) is a benchmark dataset for image segmentation. It was developed by researchers at the University of California, Berkeley and contains 500 natural images for segmentation



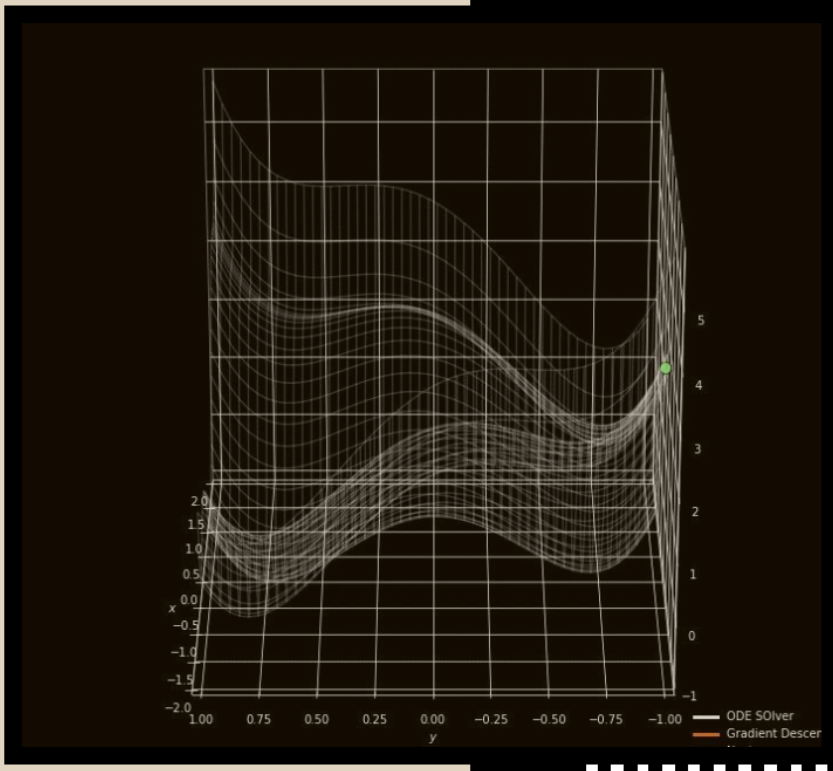
• Implementation

1. Create gray scale
2. Use gaussian blur
3. Use sobel operator
4. Use mathematical morphology

• Hypermaraters

We used 2 arrays to decide which parameters to choose from
ksize_range = [3, 5, 7]
threshold_range = [0,10,20,30,25,50,75,100,125,150,175,200,225,255]

1. sobel_threshold_value =255*4, ksize =5
2. sobel_threshold_value =100, ksize =3
3. sobel_threshold_value =100*255, ksize =7
4. sobel_threshold_value =1000*255, ksize =9



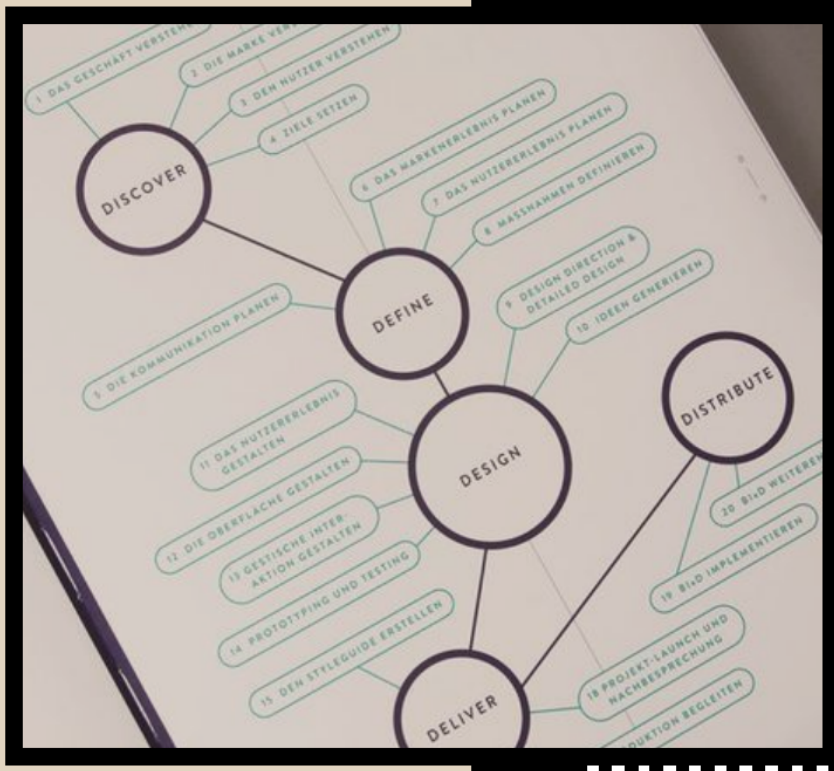
• Evaluations

Mean sum error(MSE):

the closer the number to zero the better

Structural Similarity Index (SSIM):

The close the number to 1 the better



• Conclusion

After conducting our experiment on the dataset we reached the conclusion that these parameters[Ksize=3, threshold=150] provided best scores in our evaluation metrics.

- In both cases of MSE and SSIM which we used to evaluate the scores between the ground truth and the predicted images
- Best MSE and SSIM scores came from a kernel size =3 and a threshold = 150

After that we started using these parameters on random videos we found to check the results.