

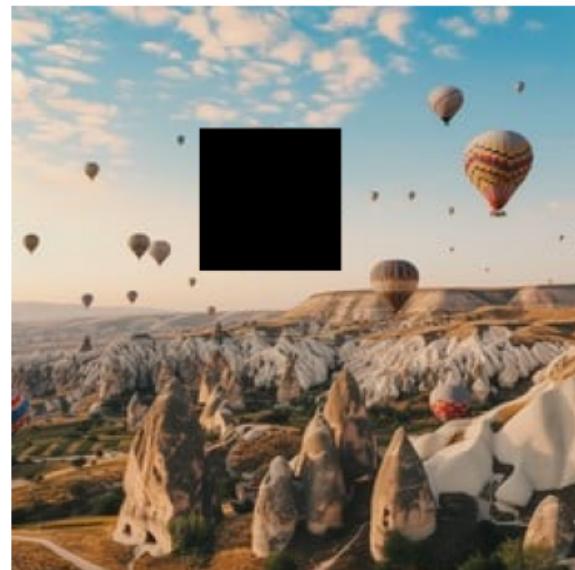
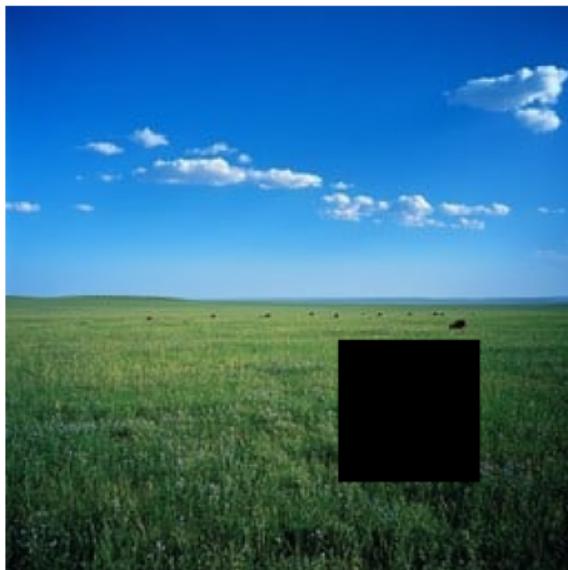
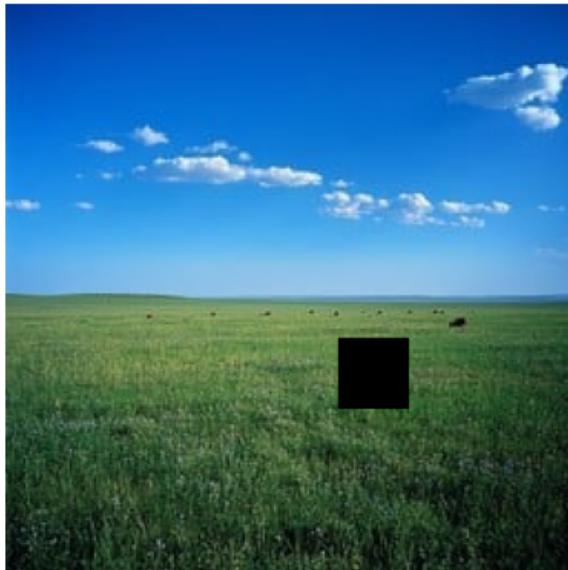
Project Report

Using Two Methods Deep Image Prior and Stable Diffusion for Image Inpainting. Stable diffusion is a data-driven model that attempts to fill in an image based on it's data-prior, while deep image prior requires no data and uses the nature of CNNs to fill in the image based on recurring patterns in the image

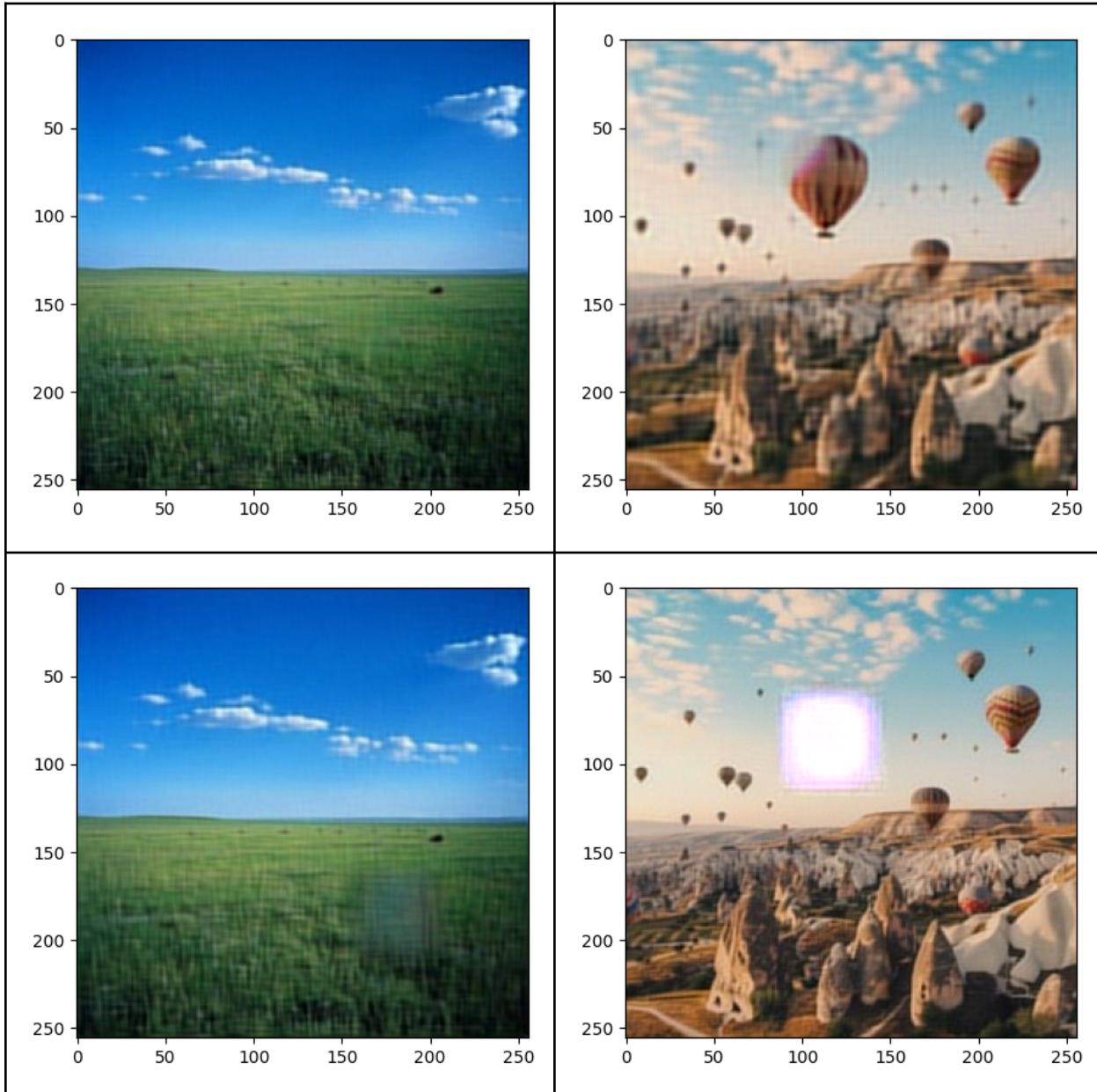
1. Deep Image Prior

I will use the same two images again for inpainting:

Inpainted Images:



Best Results I was able to generate:



2. Stable Diffusion

Stable diffusion is much more flexible and can work on more complex scenes, so let's also try to segment the image into whatever objects are in the scene!

I decided to use this resource here

<https://machinelearningmastery.com/inpainting-and-outpainting-with-diffusers/>

That recommends using META AI's segment anything model in order to obtain masks. I decided upon it because it appears to be a very power segmentation model that would be capable of doing on-the-fly segmentation masking on any random image I decide to select.

The image I selected for testing is:



1280 × 720

The segmentation algorithm outputs this mask:

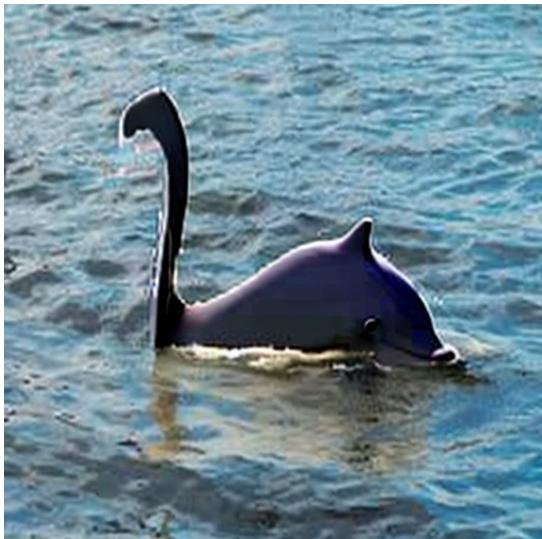


If I run the diffusion inpainting model with this image and mask, with the prompts:

“surfer riding a surf board”, “ a dolphin swimming”, “ a boat on water” (guidance scale is 7.5)



Same prompts with a guidance scale of 20:



With a larger guidance scale, the inpainted objects do appear to be more specific and detailed. I think this is especially true with the boat. However, this method appears to really struggle with inpainting the neck/head of the swan as it tries to apply the prompt to that part of the swan when it would be more realistic to just fill it with water.