Failure Cases and Their Solutions

- **When Grounded-SAM fails to segment the object.**
    - **Consequences**: The error will propagate to the view-synthesis model (zero 1-to-3) and will affect the generation.
    - **Example**:

(Raw Image)

(Grounded-SAM Mask)

Solution:

Use proper text prompting:

- Instead of directly prompting the object name use a detailed prompt.
- Example: *“office chair and its parts”*

(Raw Image)

(Grounded-SAM Mask)

- **When Stable Diffusion inpainting is unsuccessful in properly removing an object due to a noisy segmentation mask at the object's border.**
    - **Consequences:** The noise added during inpainting will propagate further in the pipeline and will affect the end generation.
    - **Example:**

(Object Mask)

(Inpainting Results)

Solution

Use dilation on the segmentation mask to capture the border pixels of the object that Grounded-SAM missed.

- Kernel size of 5x5 is used with no iteration = 3

Results:

Before applying dilation

After applying dilation

- **Output Image Quality**
    - The images produced by these models experience a decline in quality.
    - Despite satisfactory outcomes from stable-diffusion-inpainting and zero-1-to-3, they fall short in delivering high-quality visuals.

    - Solution: One can use 'Image Super Resolution' at the end of the pipeline, or after inpainting and view synthesis, to address the issue of output image quality.

- **Partial-Segmentation Mask**
    - **Consequences**: The error will propagate to the view-synthesis model (zero 1-to-3) and will affect the generation.
    - Example:

Original Image

Object Mask

Possible solution:

- Use models that are more generalizable and are trained to fine-grained versatile and fine-grained objects and their respective parts.
- Example: SAM-HQ

Results

(Input Image)

(Segmentation Mask)

(Object Mask)

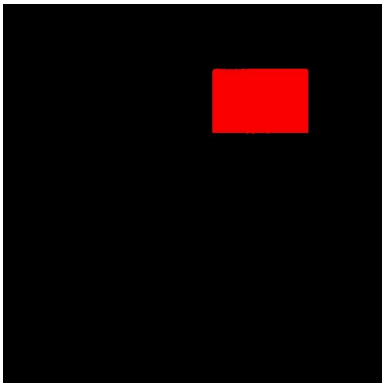
(Synthesised View)

(Inpainting Output)

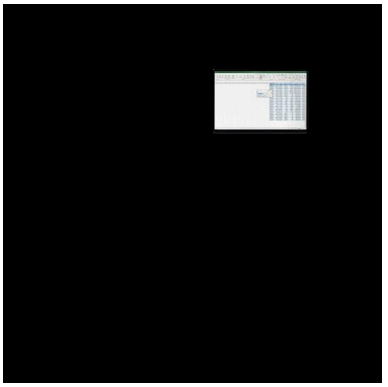
(Output)

Failure Case:

(Input Image)



(Segmentation Mask)



(Object Mask)

(Synthesised View)

(Inpainting Output)

(Output)