

Product Development

Object Remover



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What is the advantage of using AI ?

Removing objects from an existing scene / image would require a special set of skills which belong to the graphic design field.

Instead of relying on those skills or tools (Photoshop), AI can be used to remove objects of interest easily at scale.

This allows us to automate certain workflows at a fraction of the cost.



Overall workflow

1. Your raw image is given
2. Binary mask for the object of interest is extracted
3. Generate an image which doesn't include the object of interest
4. Blending with original raw image (poison blending)



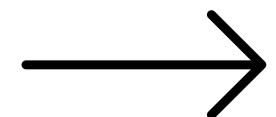
Raw image



Binary Mask



Modified image



Potential Business Impact

Data Privacy

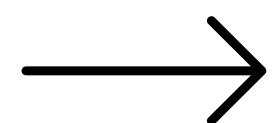
- Business requires data privacy in the highest level
- Hence sending data to proprietary vendors would be problematic
- Having a in-house solution can solve privacy issue



Potential Business Impact

Adapting to Your Domain

- Available proprietary solutions might not work with your in-domain data (medical data, geo-spatial data, etc)
- Hence custom solution is required in some use-cases

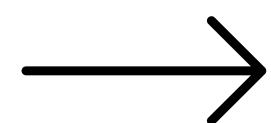


Technical details

I have created two separate pipelines to build this:

- 1. Data pipeline:** a small training dataset was used
- 2. Image generation pipeline:** below models are fine-tuned
 - a. SDXL base model
 - b. A custom controlnet

For the initial experiments, above models were fine-tuned for a few epochs with a small training dataset.

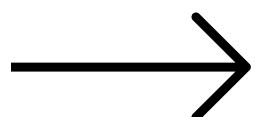


Technical details

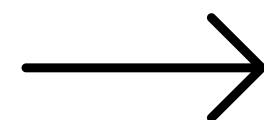
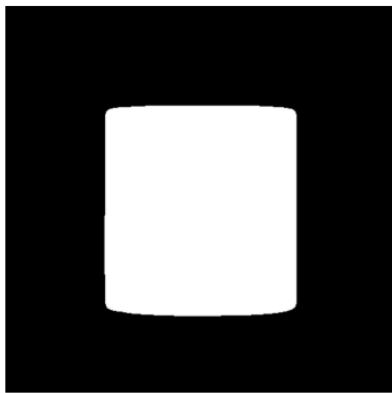
Training data would be like this:

1. **Factual image**: object of interest should be there
2. **Counterfactual image**: object of interest is removed
3. **Binary mask**: indicating the object to be removed during the process

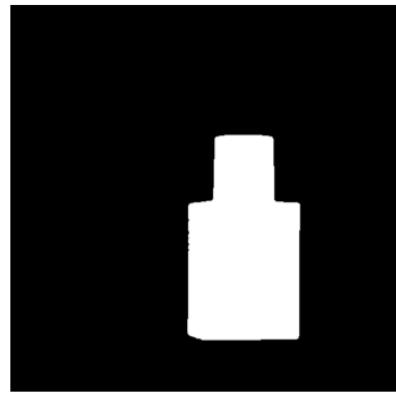
I followed the implementation of the Google's paper called **ObjectDrop** for this implementation.



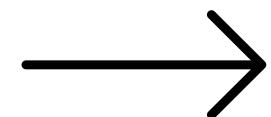
More Examples



Failure Cases



- The used training dataset was not diverse enough to capture objects with large masks
- Hence the model might not generalize well
- Using a loss function like **Flow matching** would improve the model's ability to generalize
- **Constructing cohesive background patterns requires different strategies during the training**



Product Development
ERBOLOGY

Let's build
the future
together!

BODY BALANCE

200mL | 6.8 fl oz

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Let's Connect