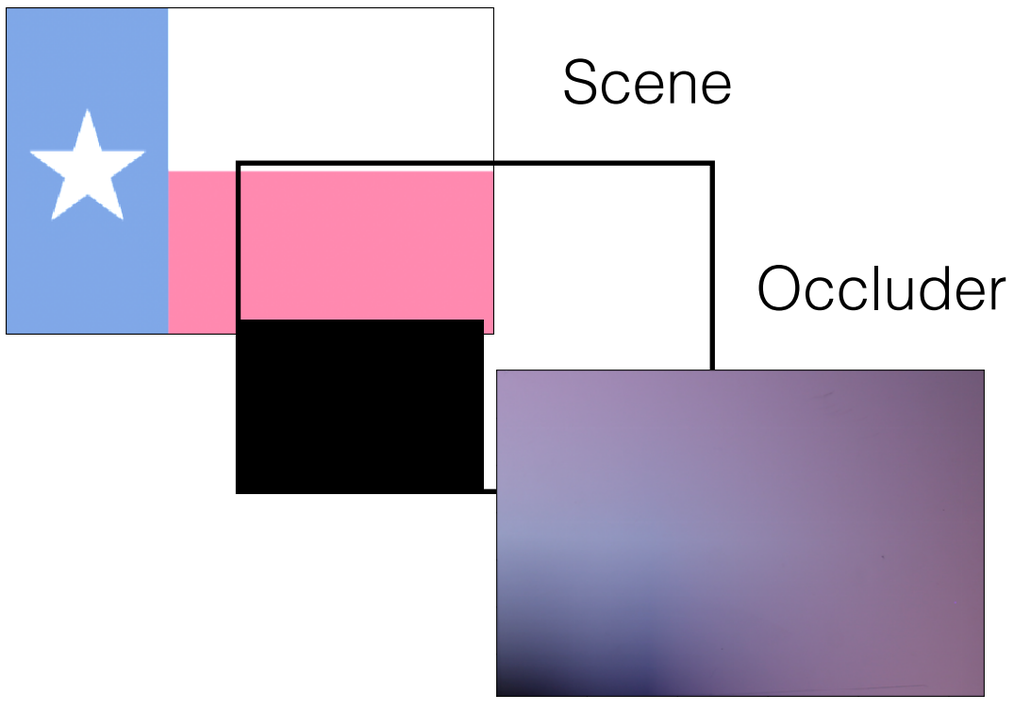
Ground truth setup

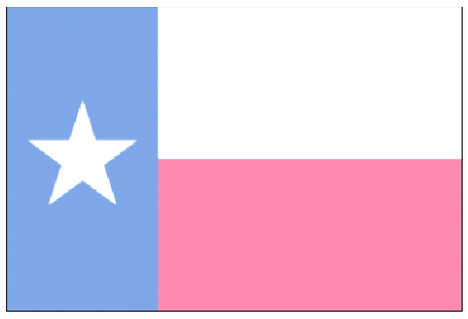


Accurately modeled occluder

Incorrectly modeled occluder

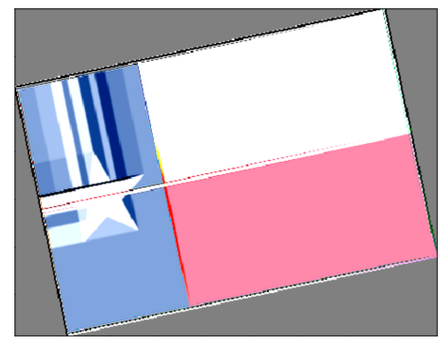
To reconstruct, we take one vertical and one horizontal derivative.

Even small inaccuracies in the modeled occluder can cause substantial artifacts in the reconstructed image.

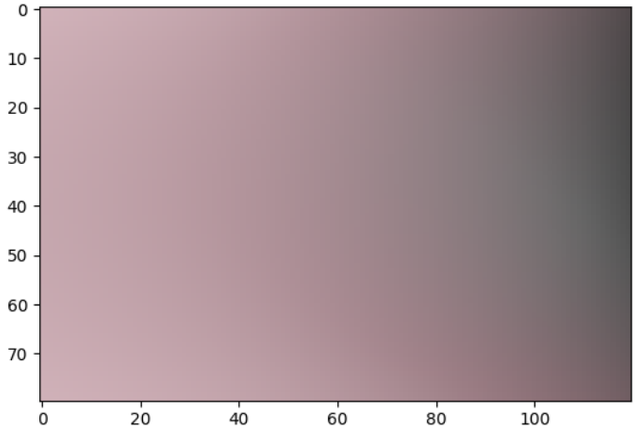


Correct reconstruction

Incorrect reconstruction



Correct reconstruction requires applying the right warp to the image before differentiating.

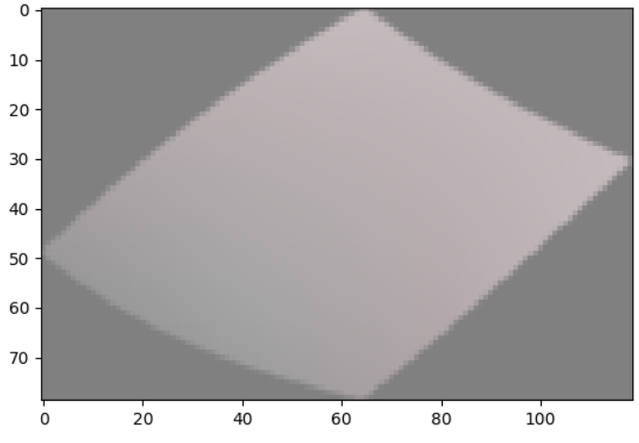


Raw observation

d/dx
d/dy

Differentiate immediately

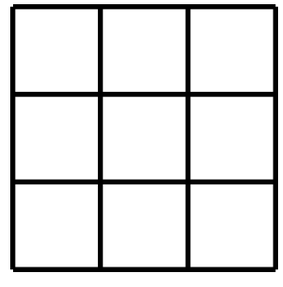
Apply correct warp



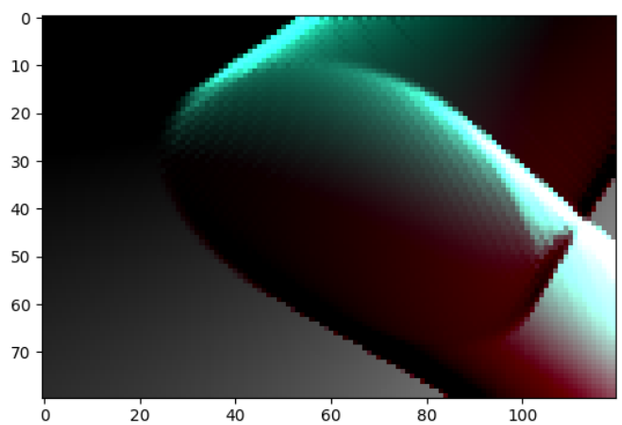
Warped observation

d/dx
d/dy

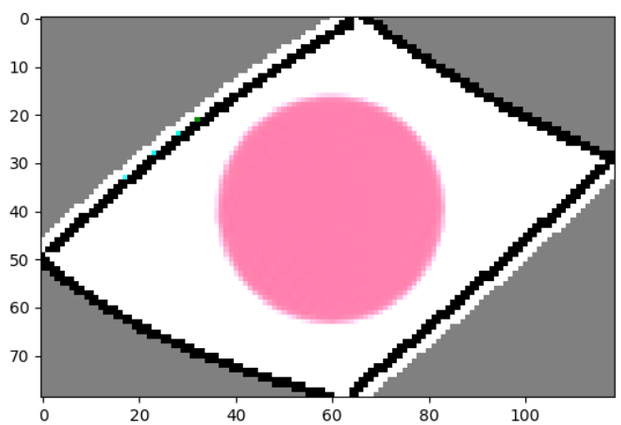
Differentiate after warp



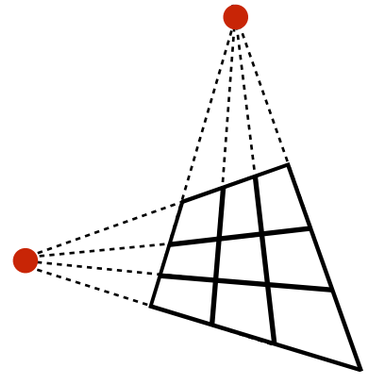
Example warp



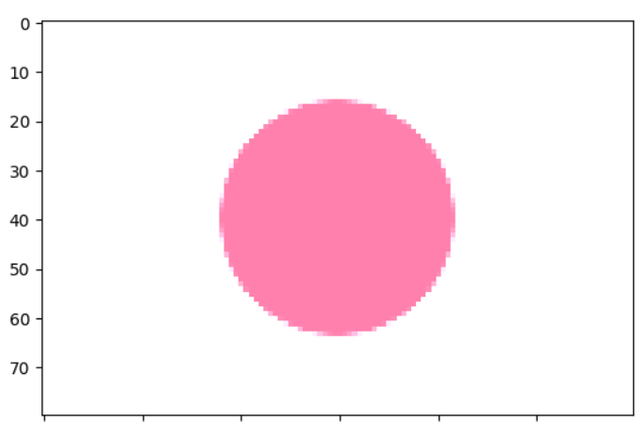
Incorrect reconstruction



Correct reconstruction



All such warps are parametrized by a single pair of warp points. Finding the right warp means finding the right warp points.



Ground truth

Idea for efficiently finding correct warp points without search: take the *second* derivative of the raw observation, look at the lines that result, and find their mutual intersections; those will be the warp points.