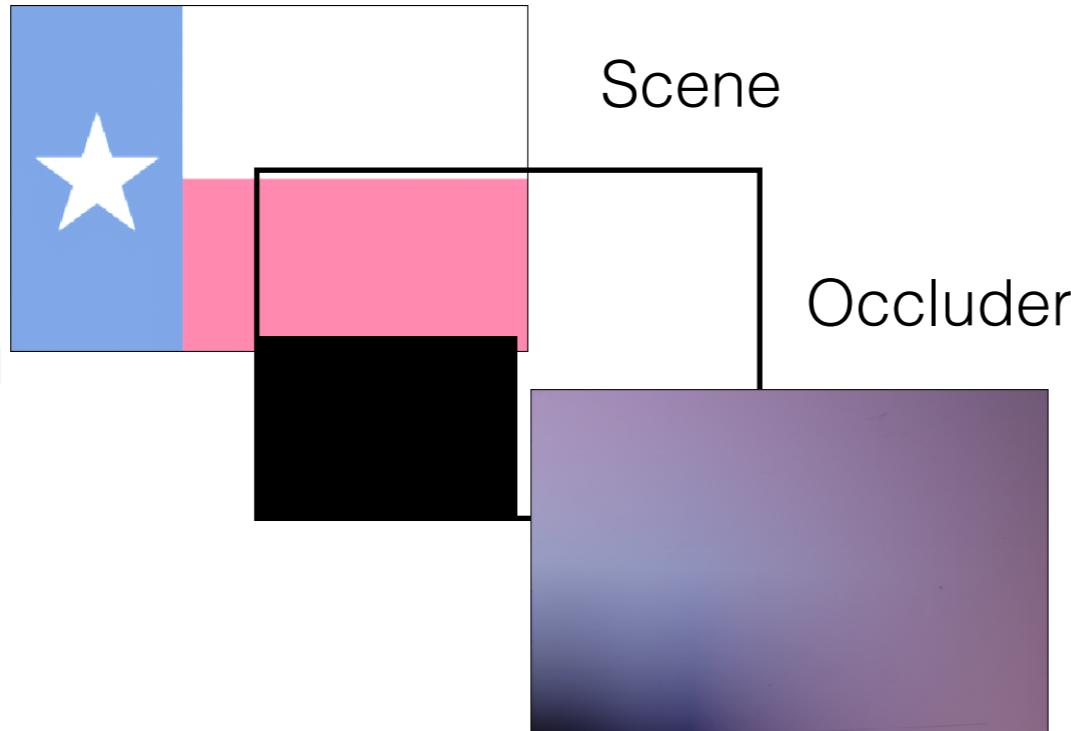


Idea: world scenes are rich with naturally-occurring right angles which could be used to reconstruct otherwise hidden information.

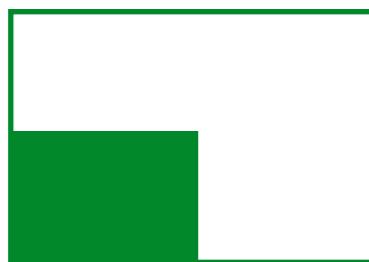


Problem: ordinary reconstruction algorithms require precise position/angle of right angle occluders to give accurate reconstruct.

Ground truth
setup



Accurately
modeled
occluder



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

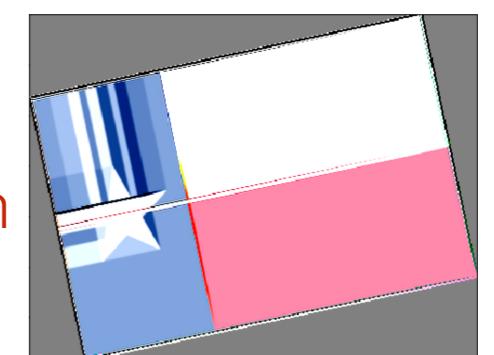
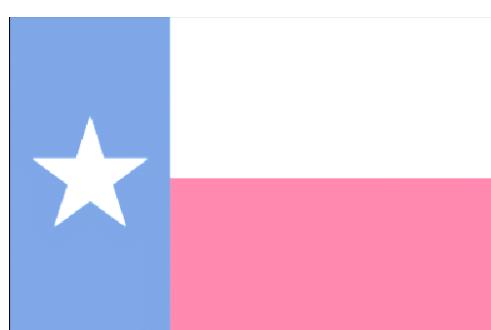
Even small inaccuracies in the modeled
occluder can cause substantial artifacts
in the reconstructed image.

Correct
reconstruction

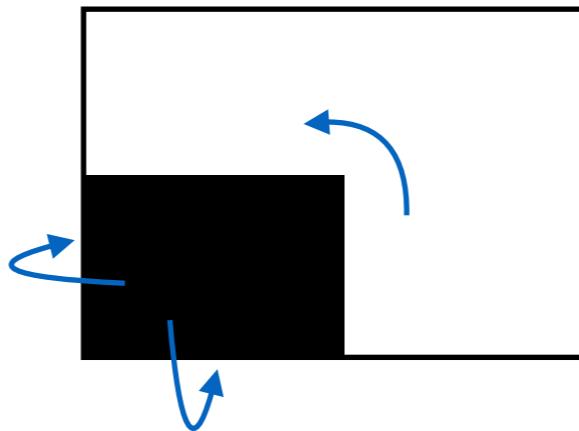
Incorrectly
modeled
occluder



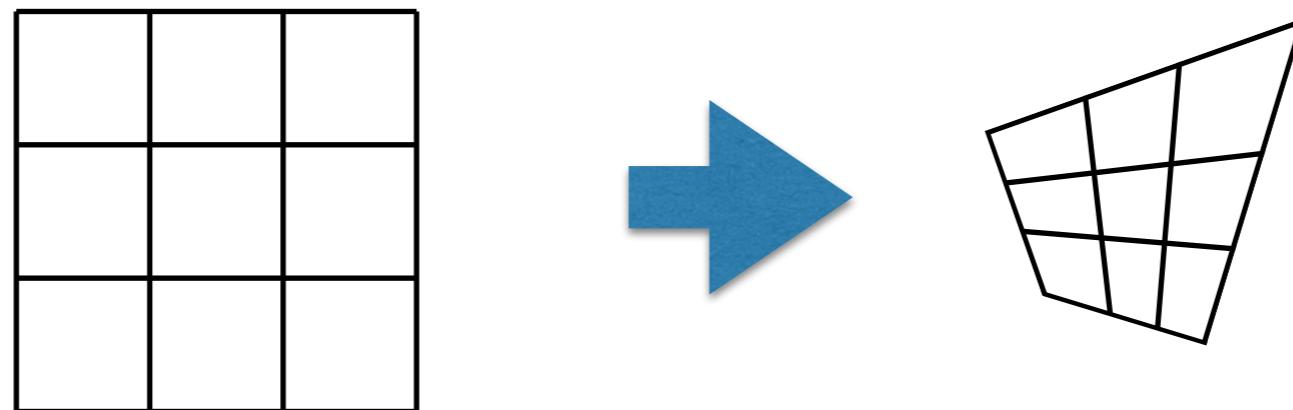
Incorrect
reconstruction



Solution: search exhaustively over possible occluder orientations



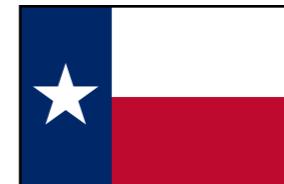
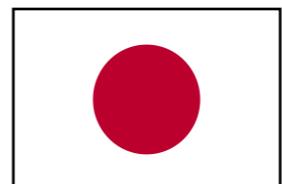
Each possible orientation will imply a different *warp* should be applied to the image before differentiating.



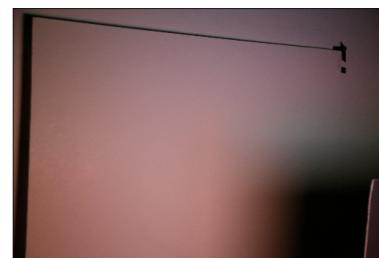
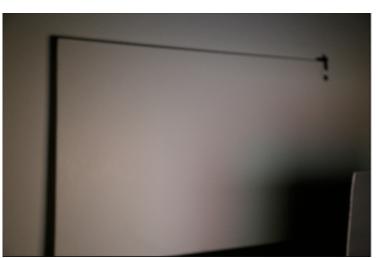
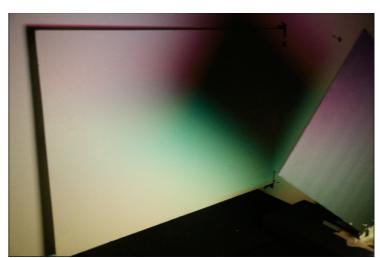
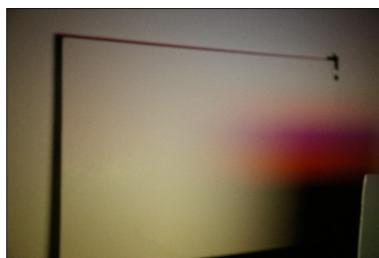
We choose the warp that leads to the reconstruction with the fewest “impossible values” (very large negative or positive values)

Result: rectified reconstruction is possible without any calibration or scene knowledge!

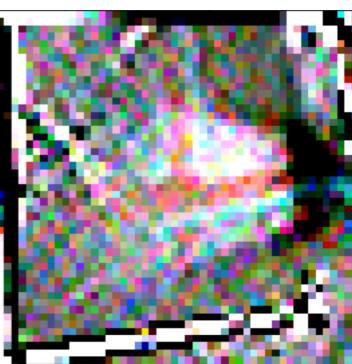
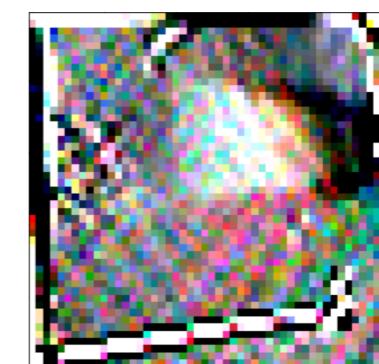
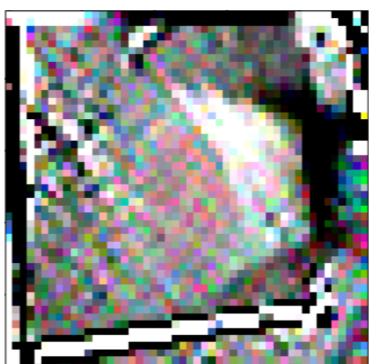
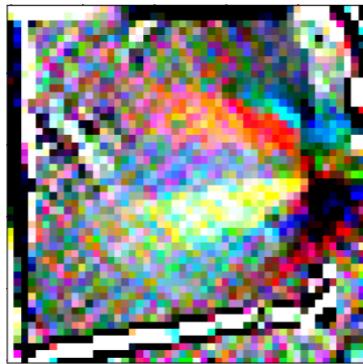
Ground truths



Observations



Direct reconstruction



Reconstruction after applying best warp

