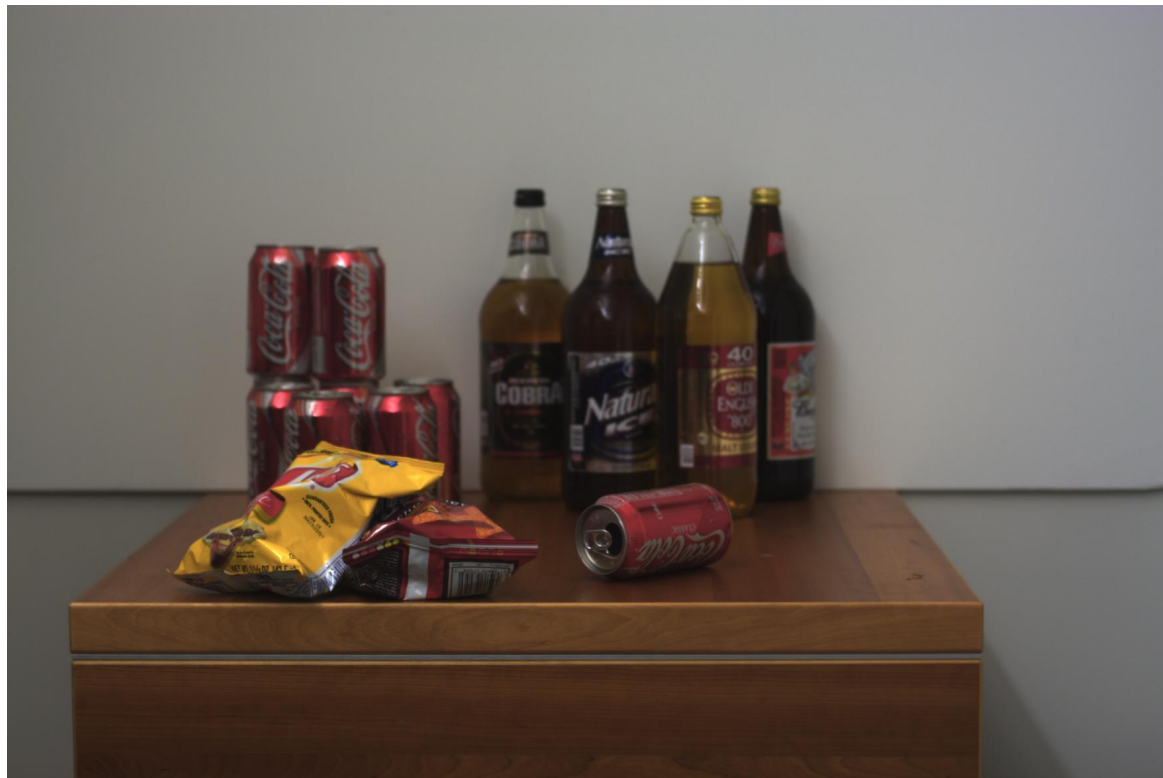
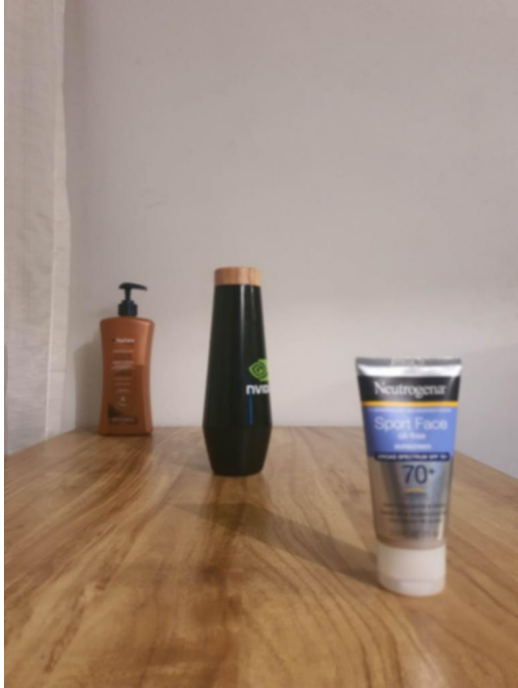

Coded aperture to obtain depth and all in focus image

— Moneish Kumar —

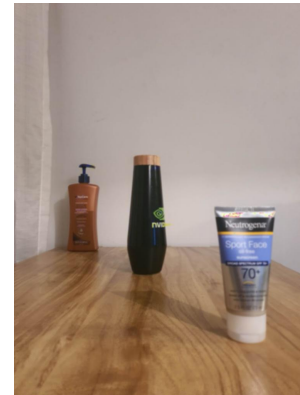
Motivation



Overview

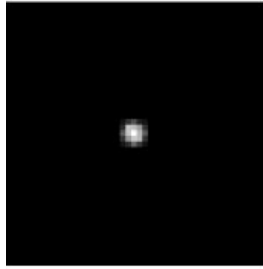


Depth

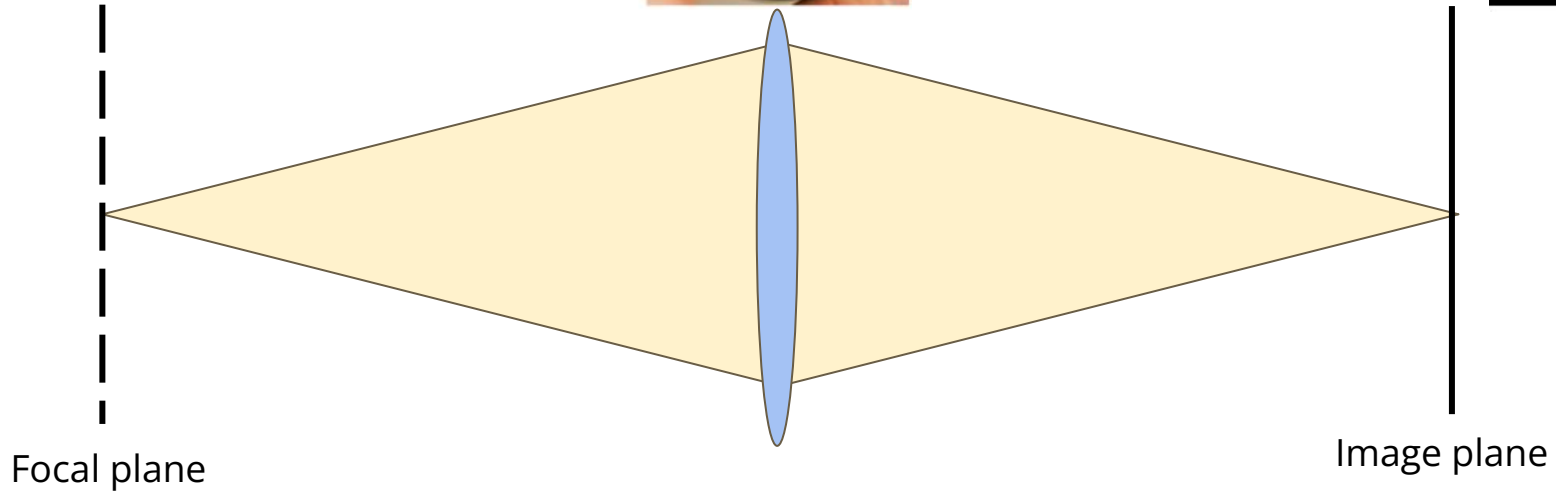


All in focus

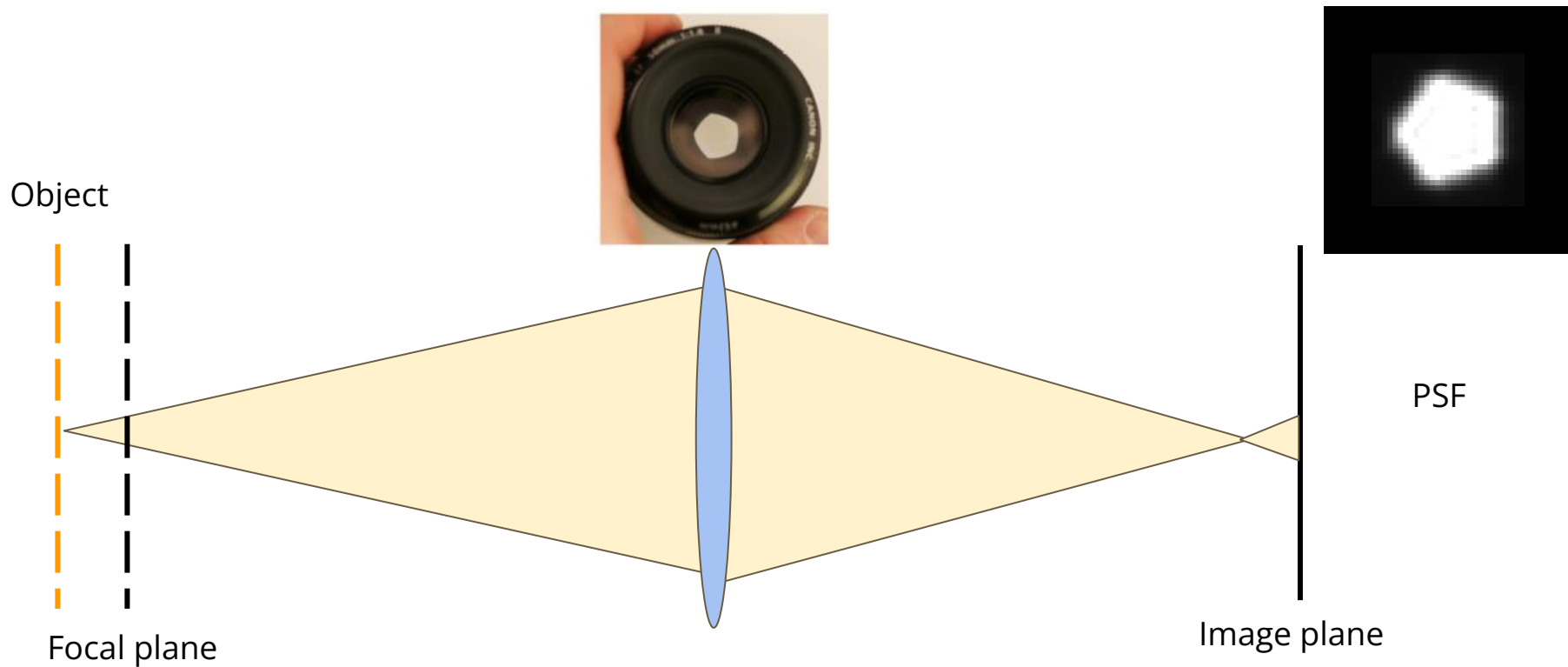
Defocus Blur



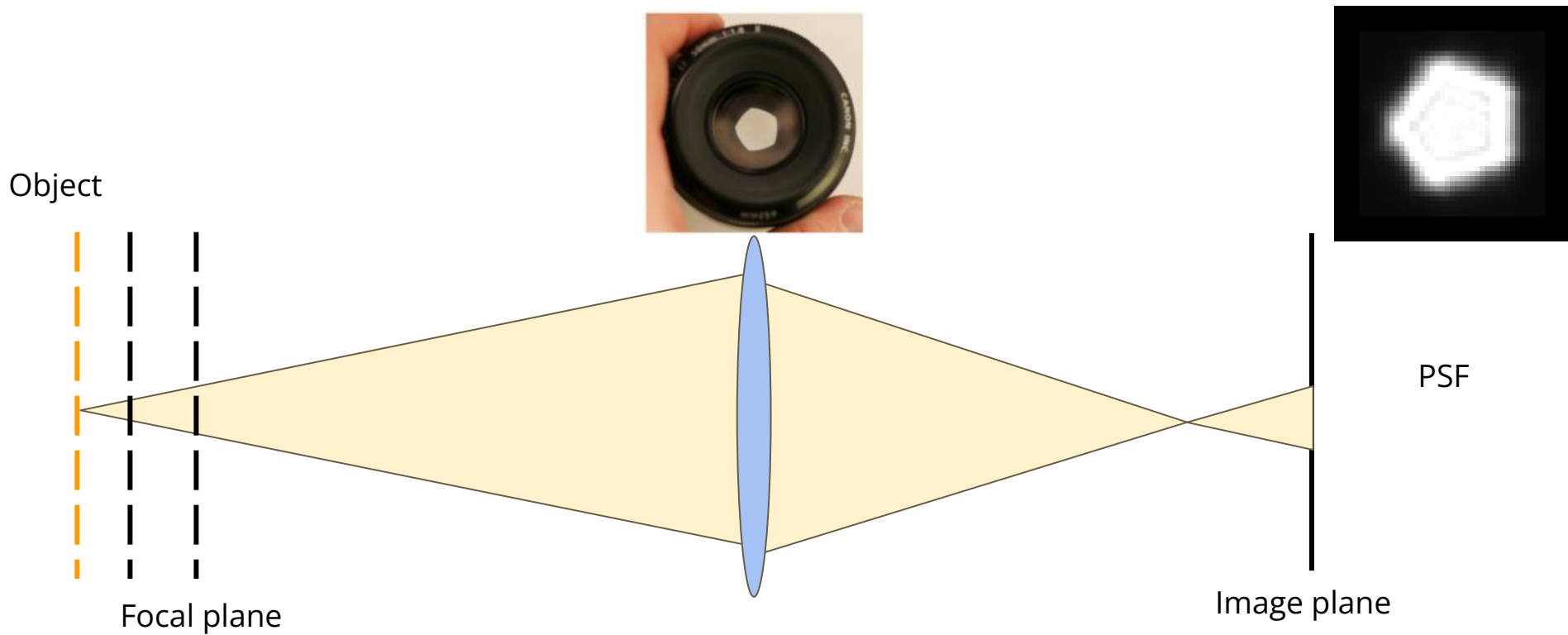
PSF



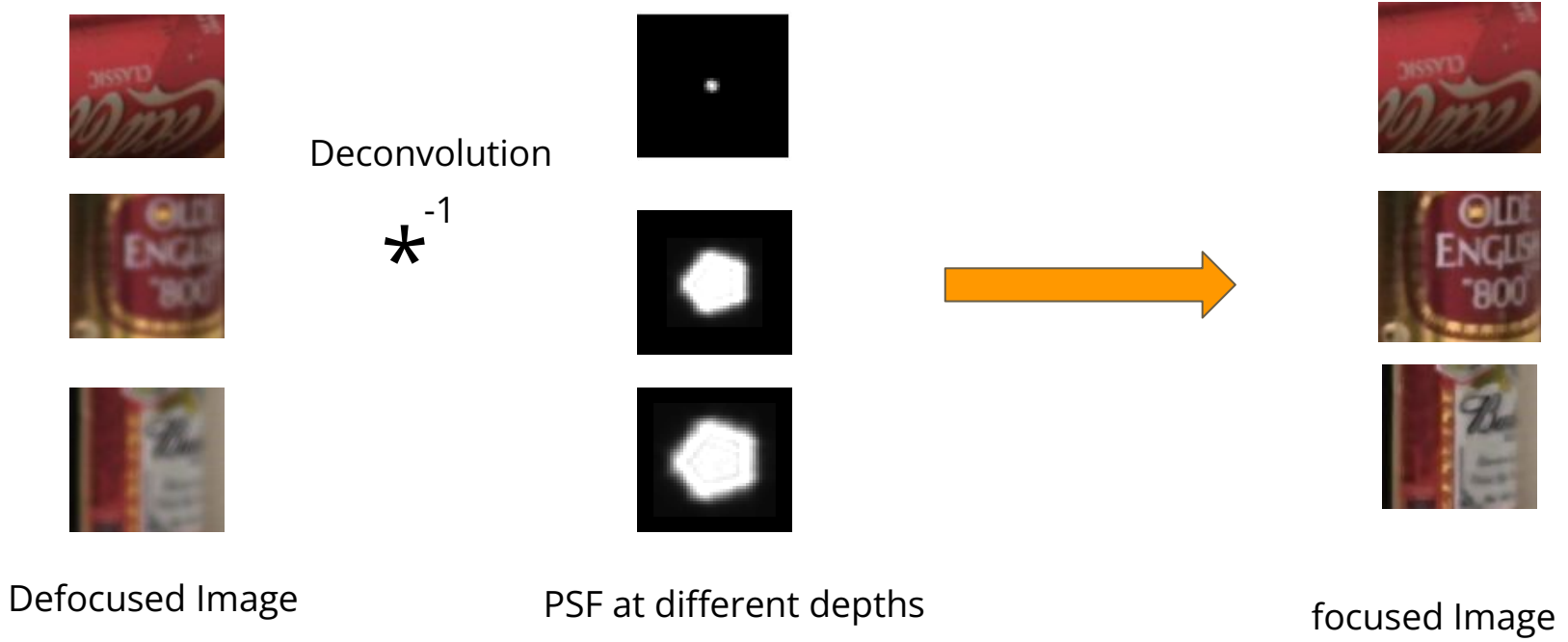
Defocus Blur



Defocus Blur



Removing Defocus Blur

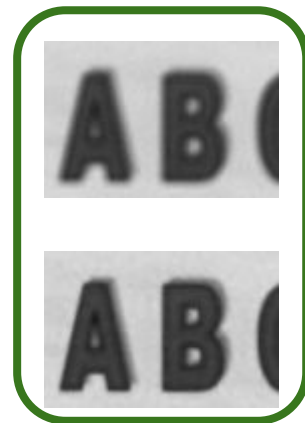
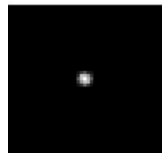


Issues with conventional aperture



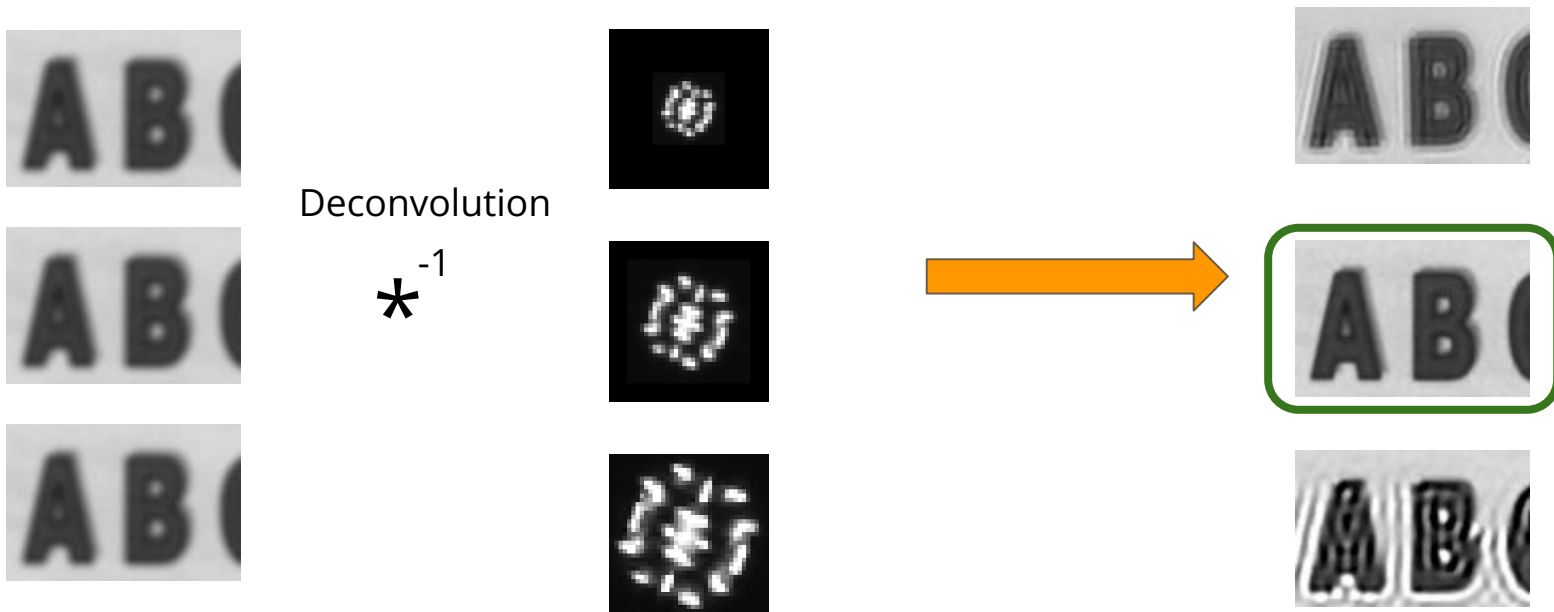
Deconvolution

\ast^{-1}



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Coded aperture



Coded aperture

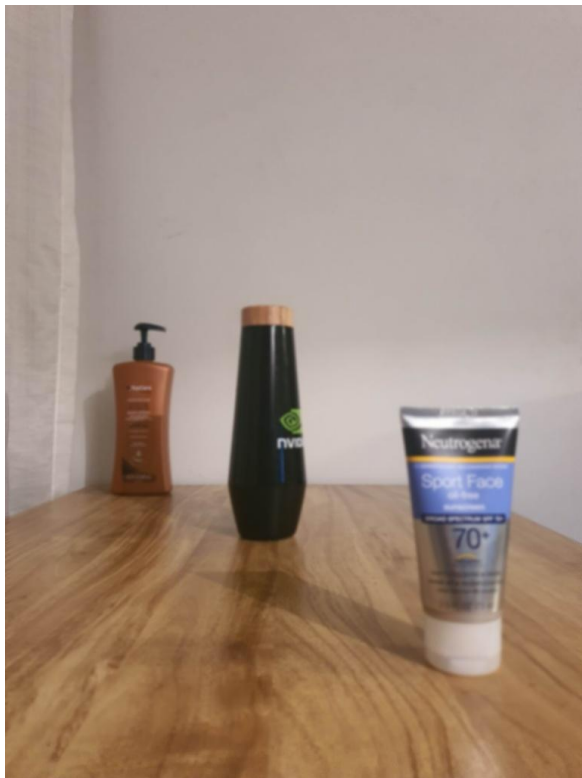
Pros

- Zeros improve depth discrimination

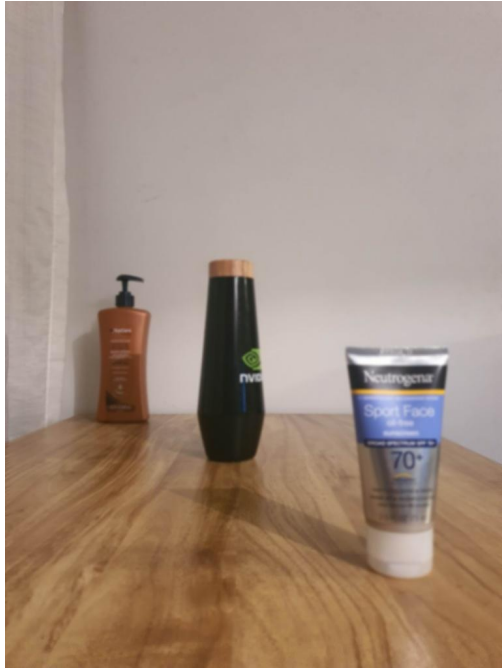
Cons

- Inversion Difficult, made possible with image priors

Using regions of interest



Results



Without using RoI search space



Using RoI search space

Results

Original Image



Results

All in focus Image



Artifacts



Thank you

References

- Levin, Anat, et al. "Image and depth from a conventional camera with a coded aperture." *ACM transactions on graphics (TOG)* 26.3 (2007): 70-es.