

Computer Vision 691A

Alignment: Dealing with alignment problems

Image Pyramids

- Basic pyramid:
 - Half the resolution (via sampling or interpolation) at each level. Number of levels: $\text{Log}(n)$.
- Gaussian pyramid:
 - Gaussian blur the image, then subsample.

Gaussian Pyramid



Fig. 2a. *The Gaussian pyramid. The original image, G , repeatedly filtered and subsampled to generate the sequence of reduced resolution image G_1 , G_2 , etc. These comprise a set of lowpass-filtered copies of the original image in which the bandwidth decreases in one-octave steps.*



G_1

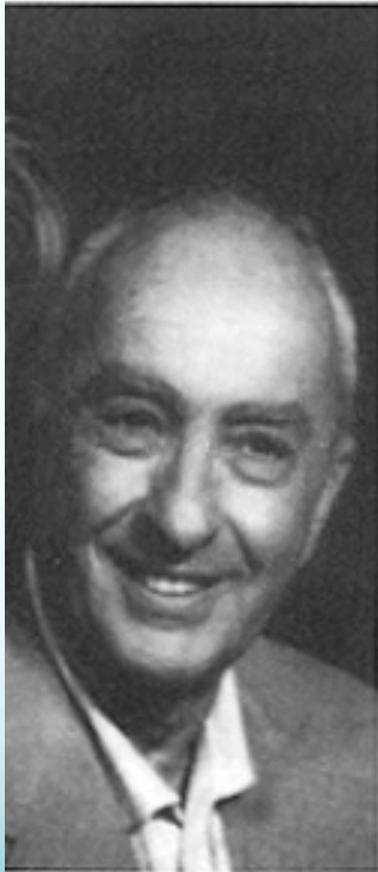


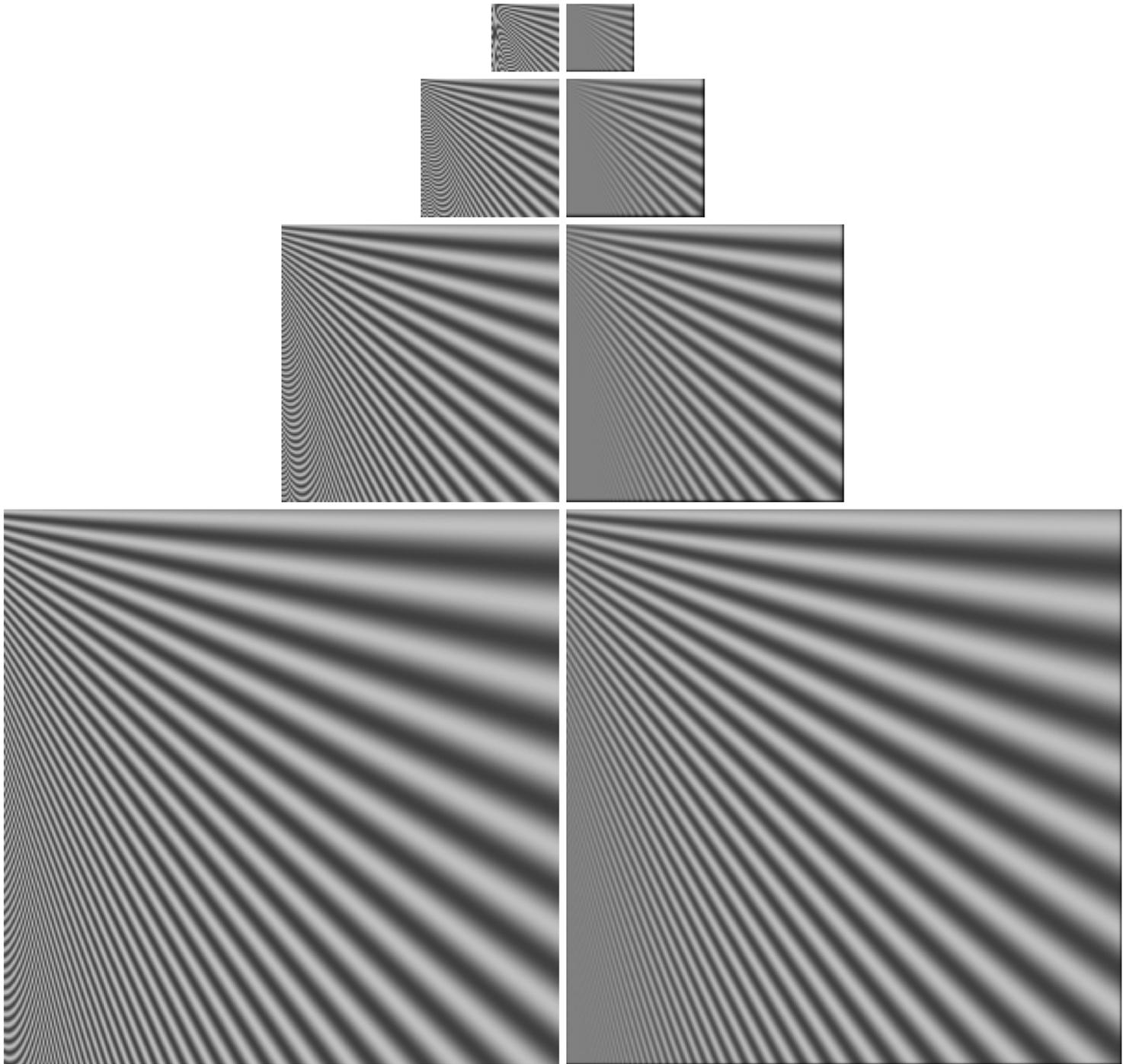
G_2



G_3

Gaussian Pyramid





When does blurring lose the target?



Basin of attraction studies



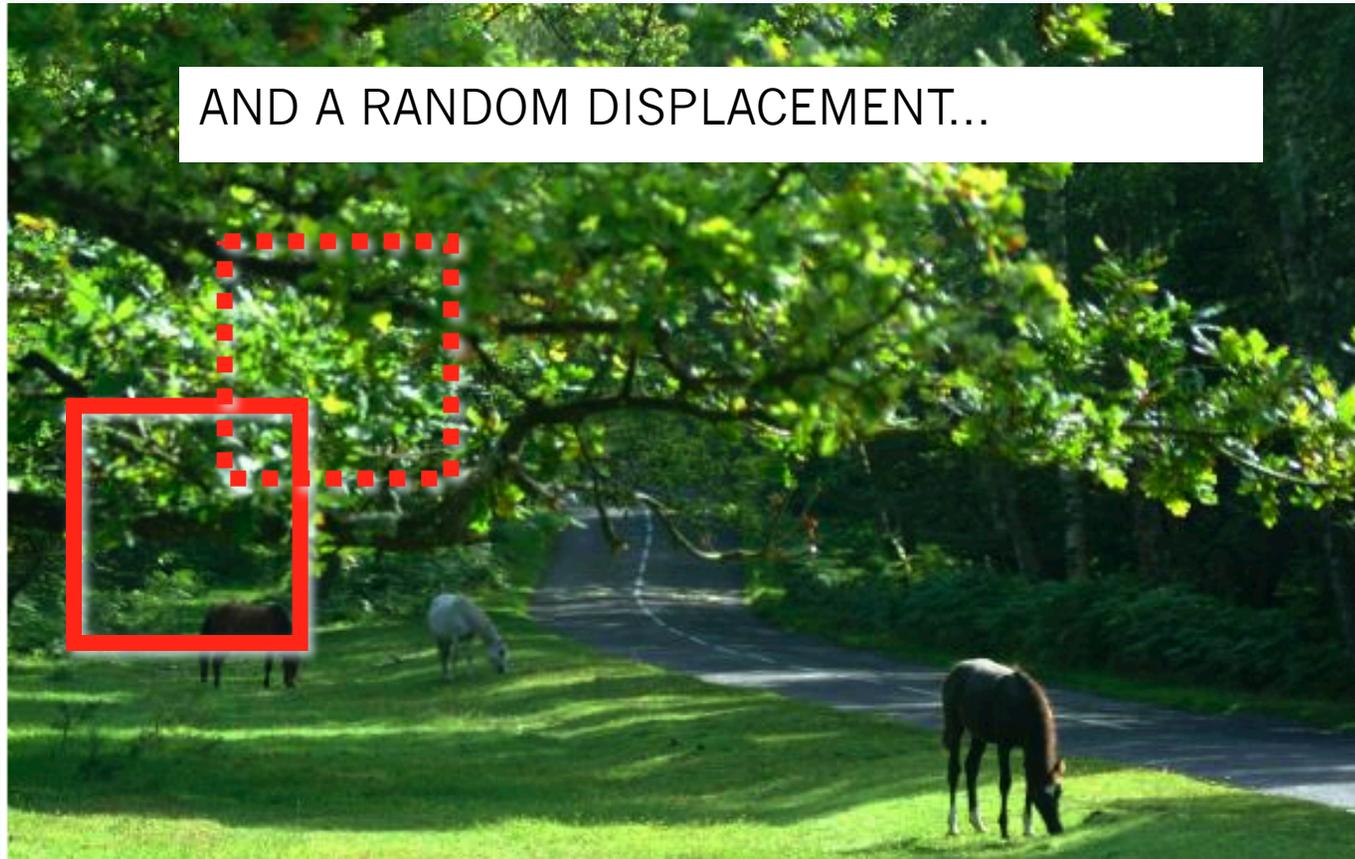
Basin of attraction studies

GIVEN A RANDOM PATCH...



Basin of attraction studies

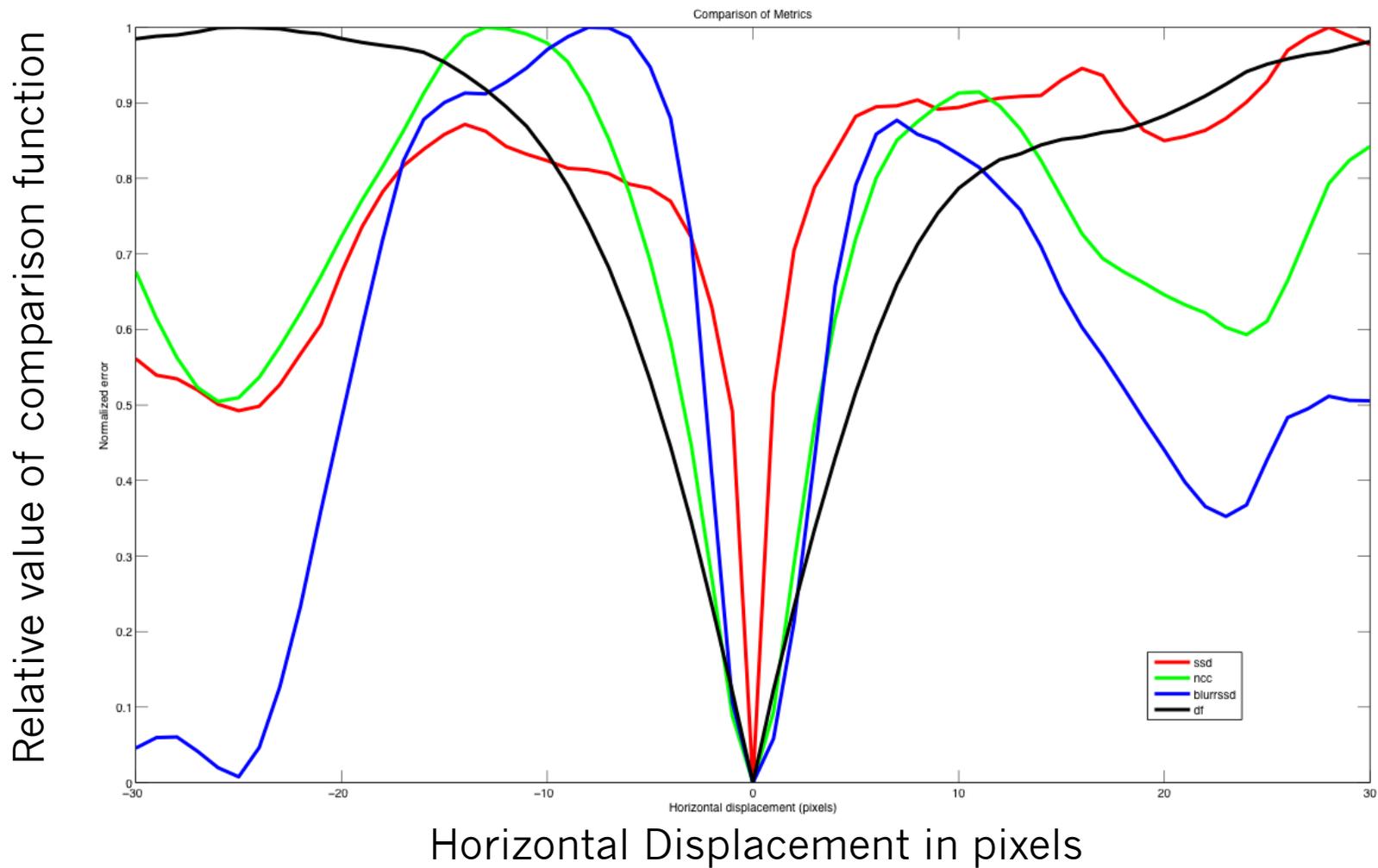
AND A RANDOM DISPLACEMENT...



Basin of attraction studies



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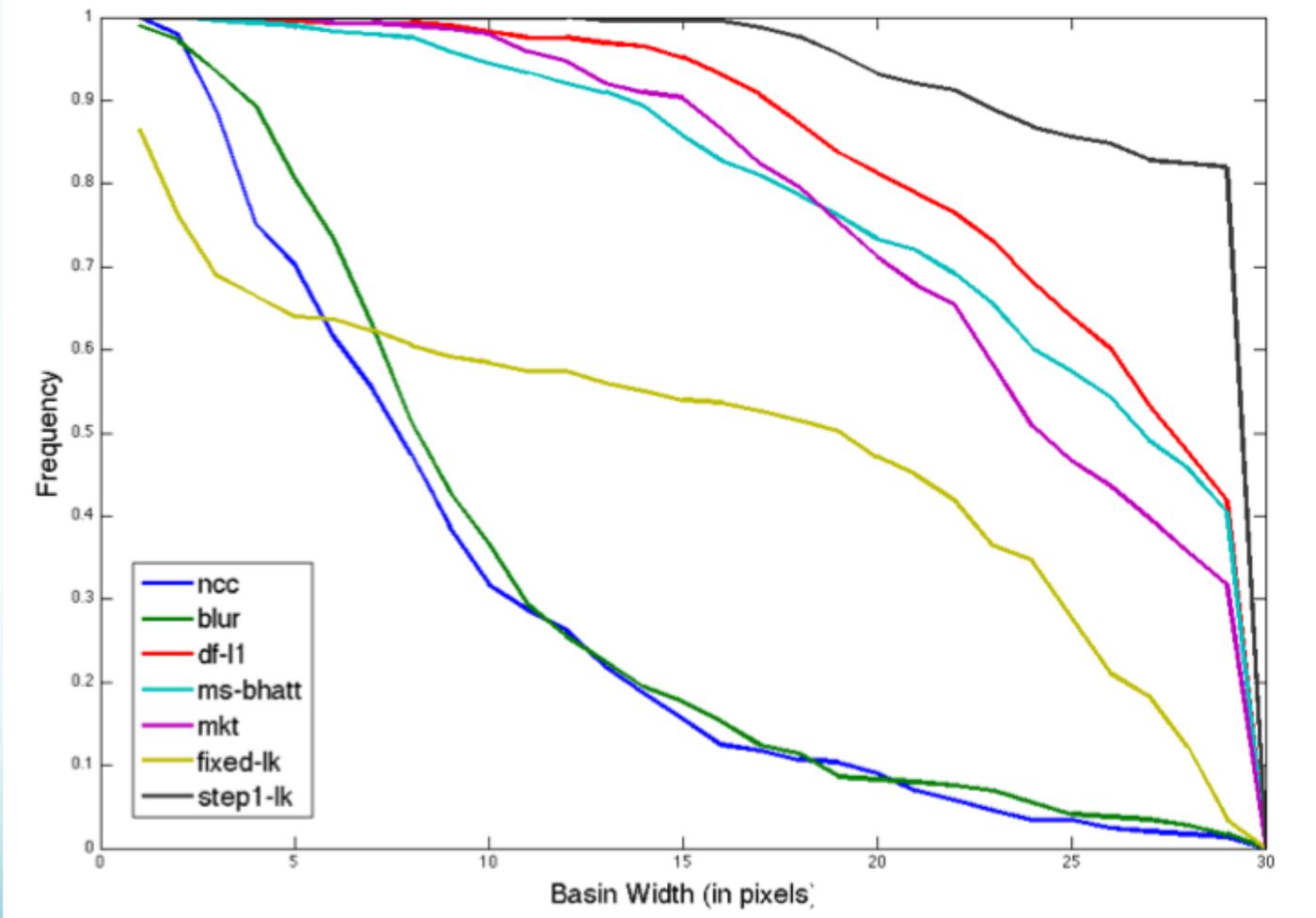


Basin of Attraction Examples

- Go to web page.

Basin of attraction results

Frequency of Convergence to Origin



Horizontal Displacement in pixels

- Go to congealing slides