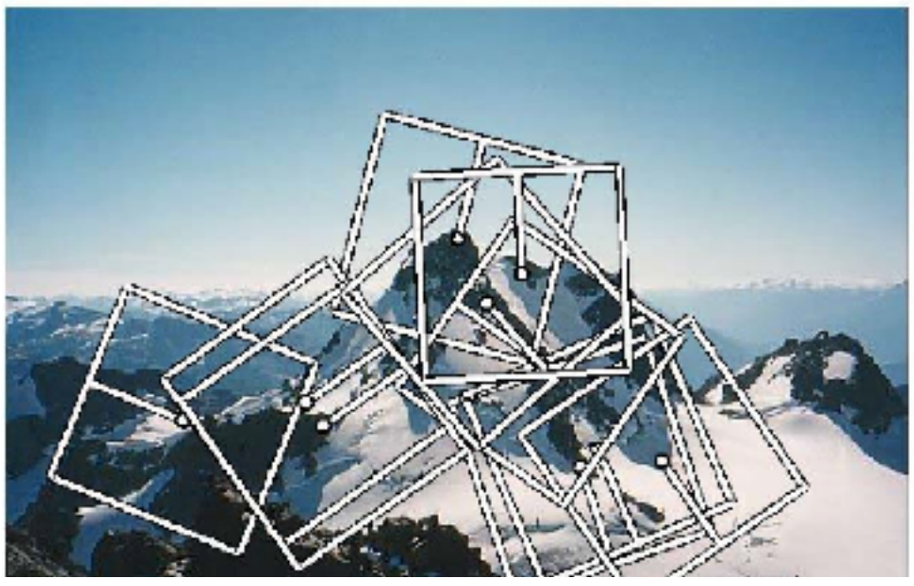


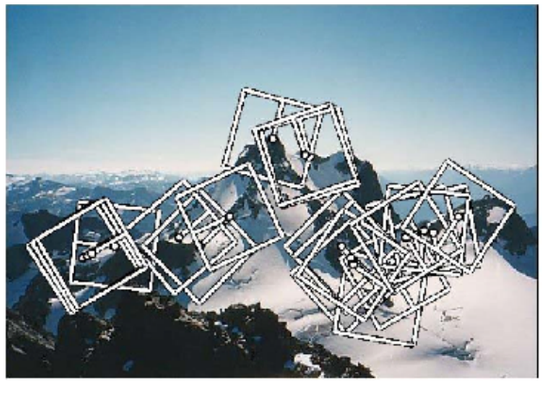
Multi-Scale Oriented Patches

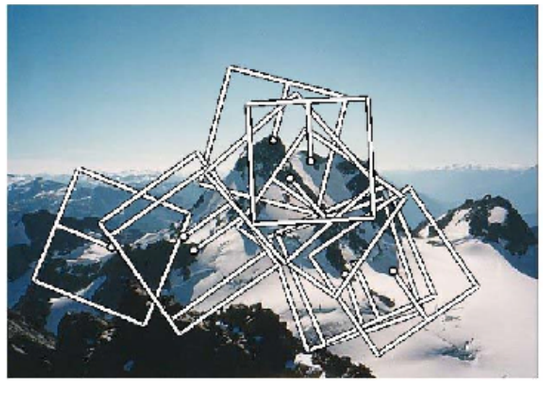
Computer Vision

Carnegie Mellon University (Kris Kitani)

Multi-Scale Oriented Patches (MOPS)

Multi-Image Matching using Multi-Scale Oriented Patches. M. Brown, R. Szeliski and S. Winder. International Conference on Computer Vision and Pattern Recognition (CVPR2005). pages 510-517





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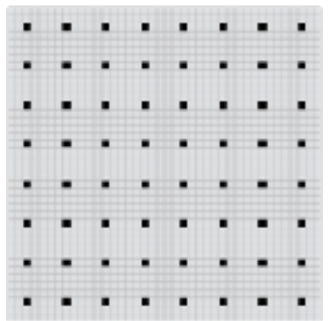
Given a feature (x, y, s, θ)

Get 40 x 40 image patch,
subsample every 5th pixel
(*what's the purpose of this step?*)



Subtract the mean, divide by standard deviation
(*what's the purpose of this step?*)

Haar Wavelet Transform
(*what's the purpose of this step?*)

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Given a feature (x, y, s, θ)

Get 40 x 40 image patch,
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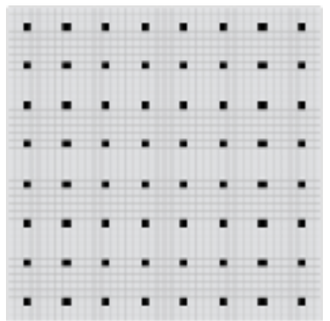
(low frequency filtering, absorbs localization errors)



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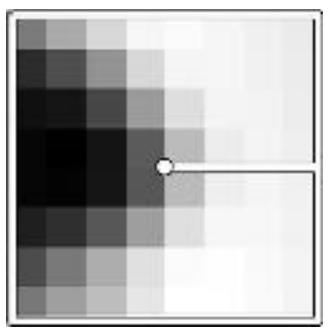

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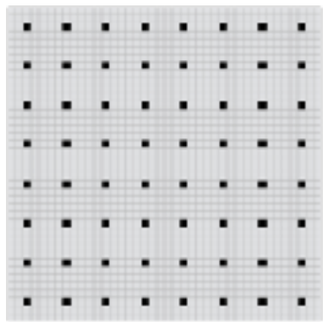
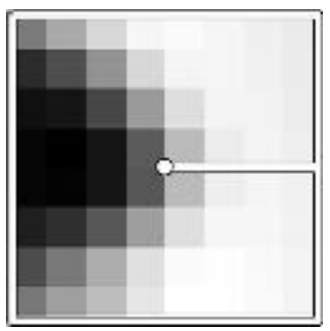


Subtract the mean, divide by standard deviation
(removes bias and gain)



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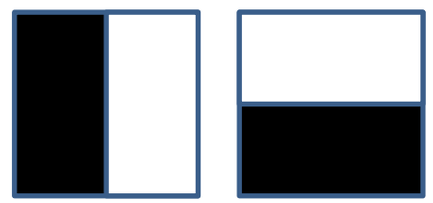

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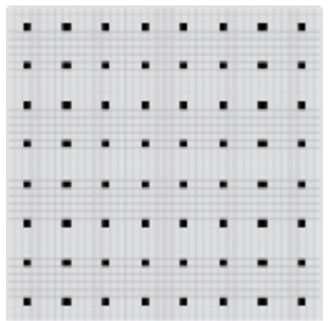

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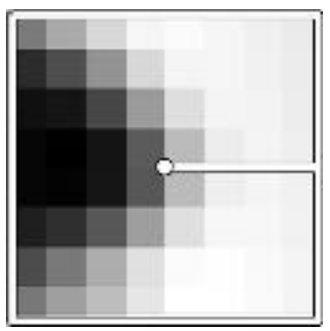
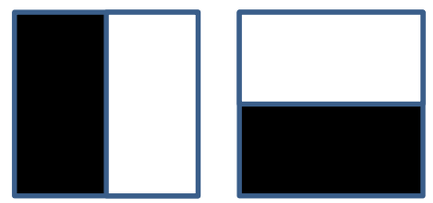


Haar Wavelet Transform
(low frequency projection)



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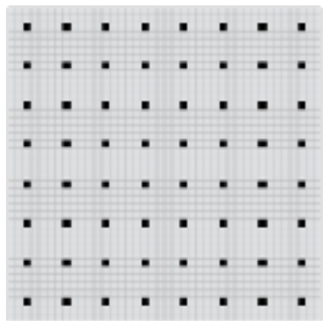

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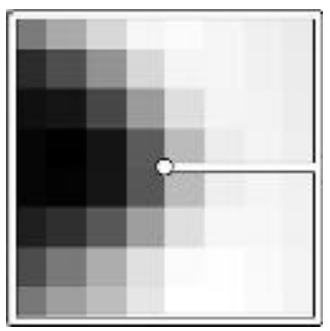

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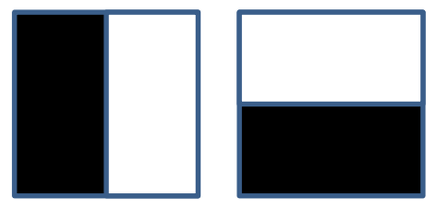
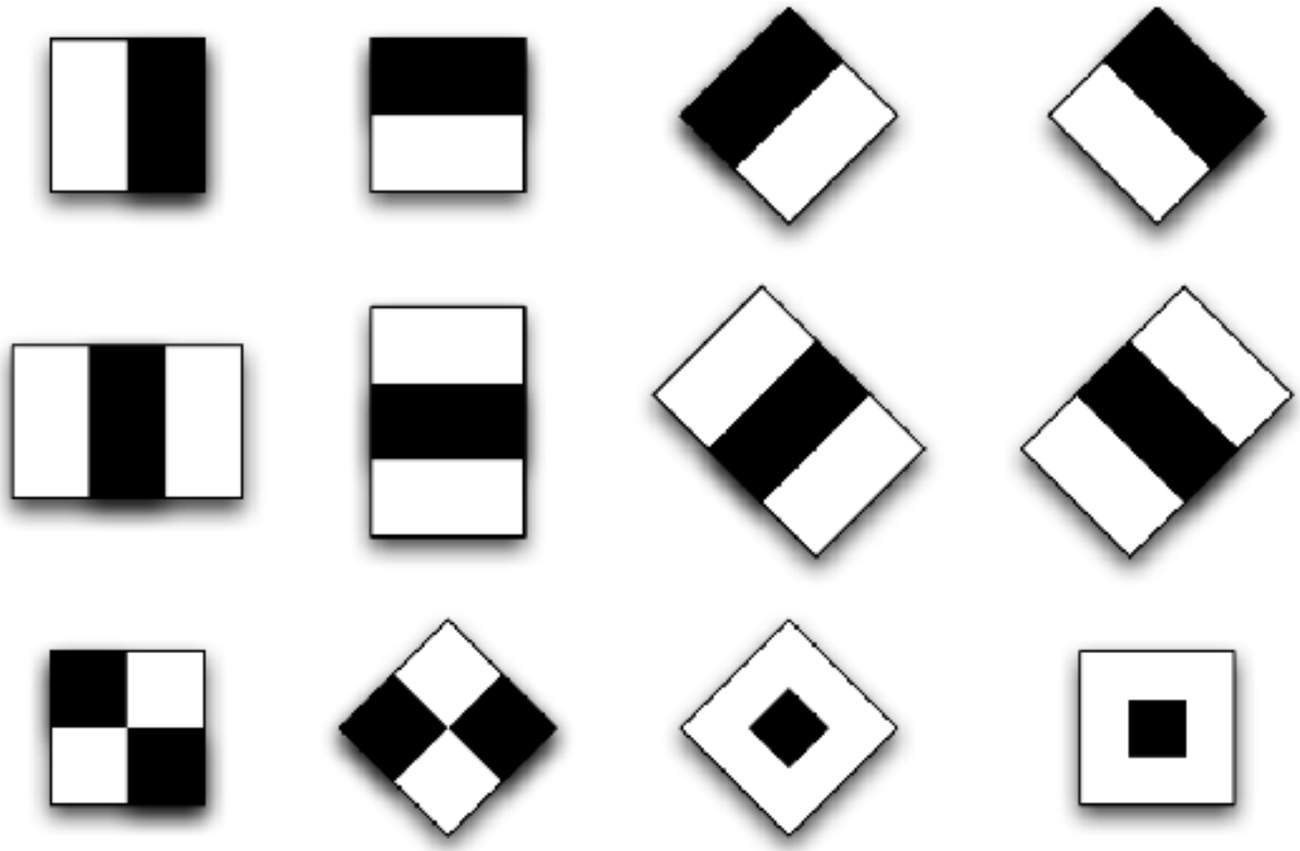


Haar Wavelets

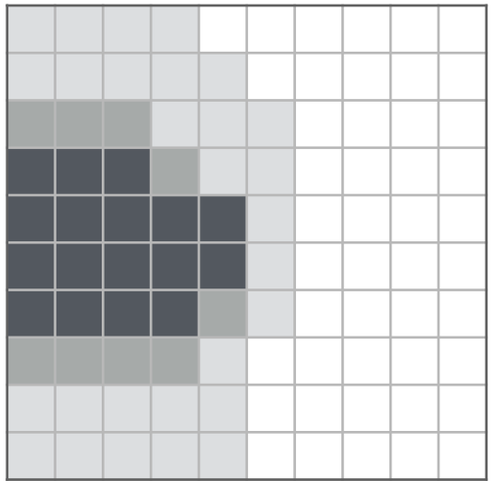
(actually, Haar-like features)

Use responses of a bank of filters as a descriptor

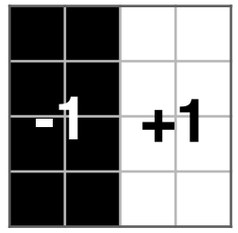


Haar wavelet responses can be computed with filtering

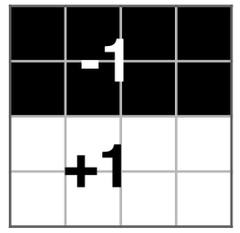
image patch



Haar wavelets filters



d_x



d_y

Haar wavelet responses can be computed
efficiently (in constant time) with integral images