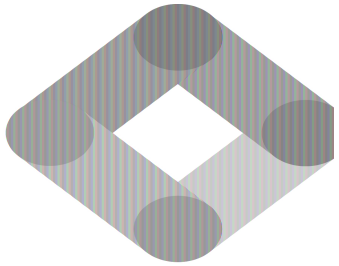
Neural Photo Editing

Andrew Brock



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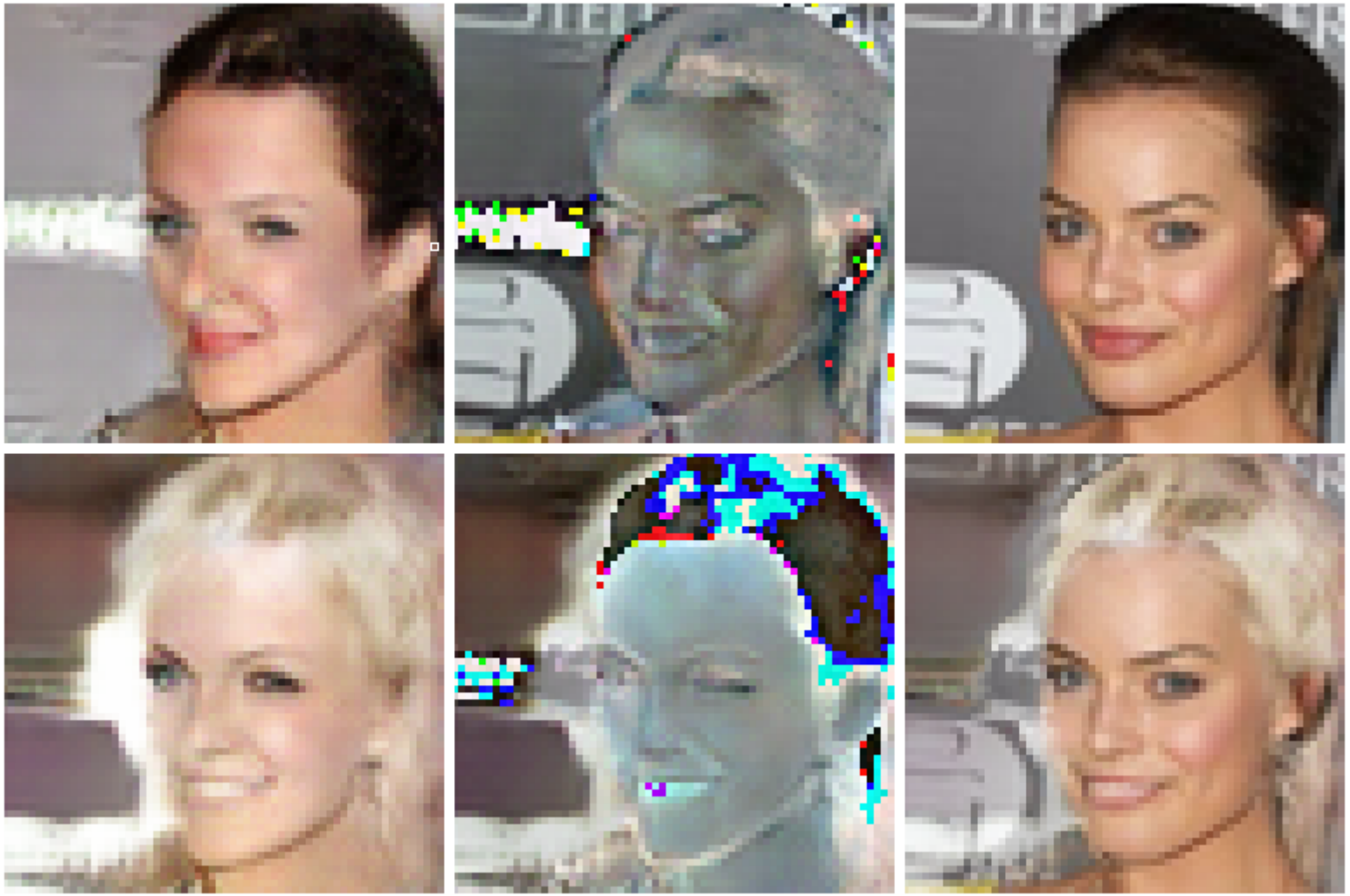
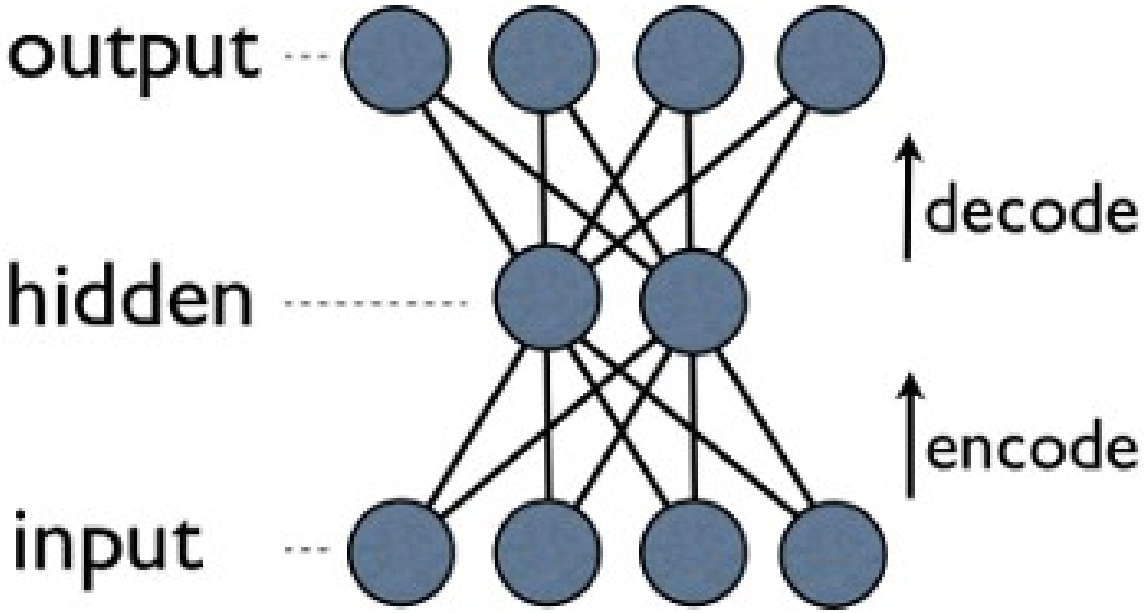
Introduction



Background: VAEs



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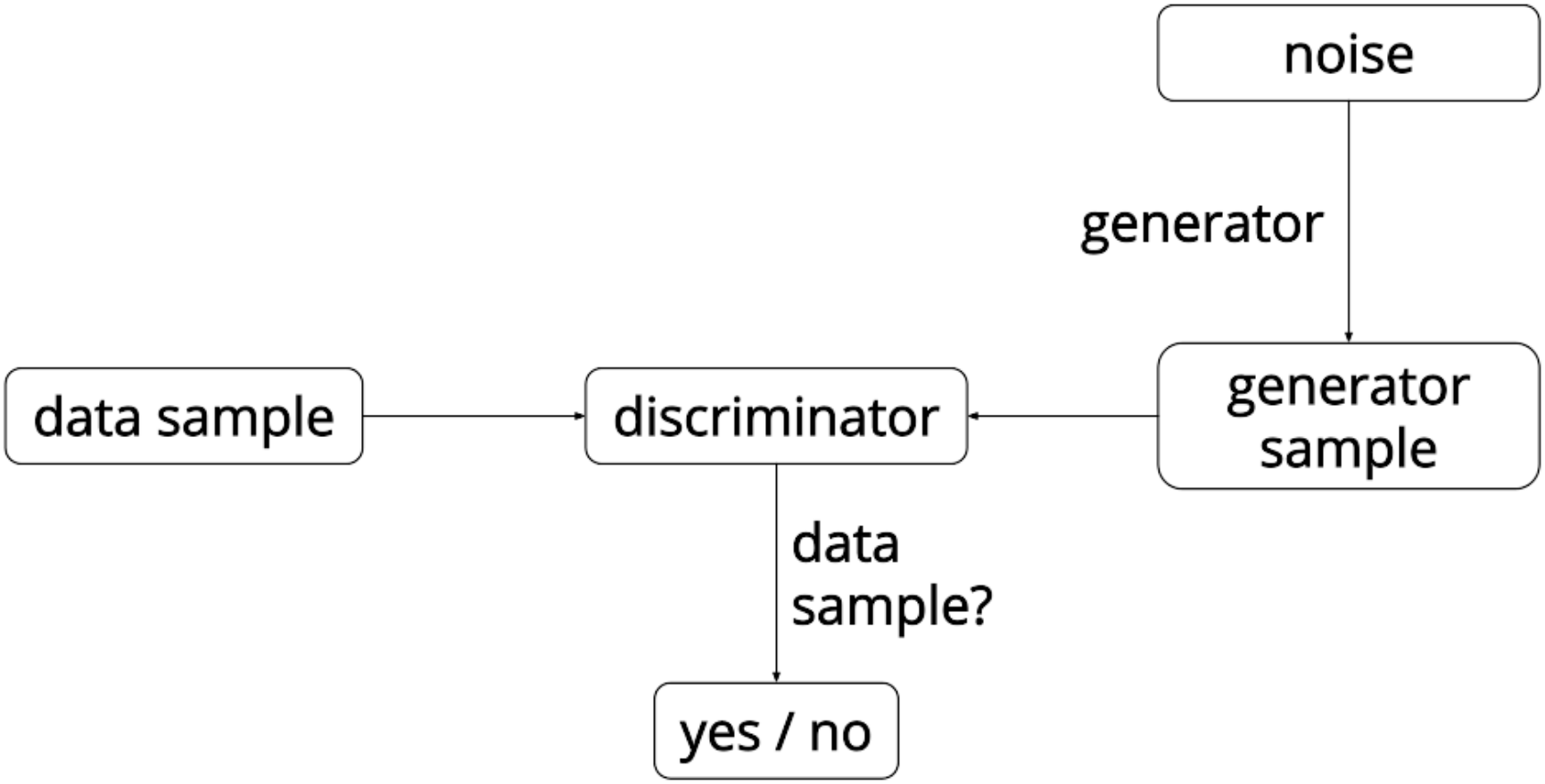
Background: VAEs

Background: GANs



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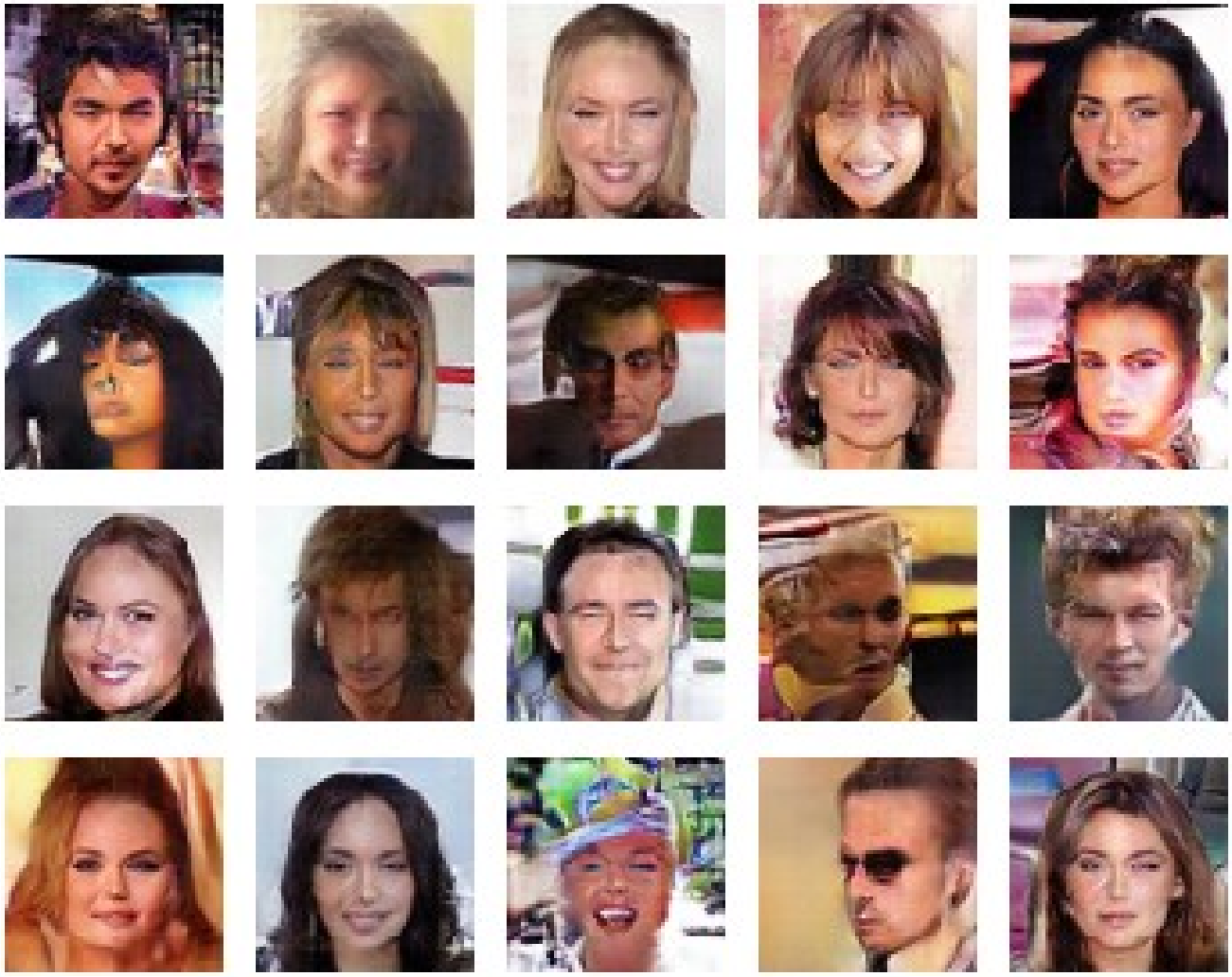
Background: GANs



The IAN Model

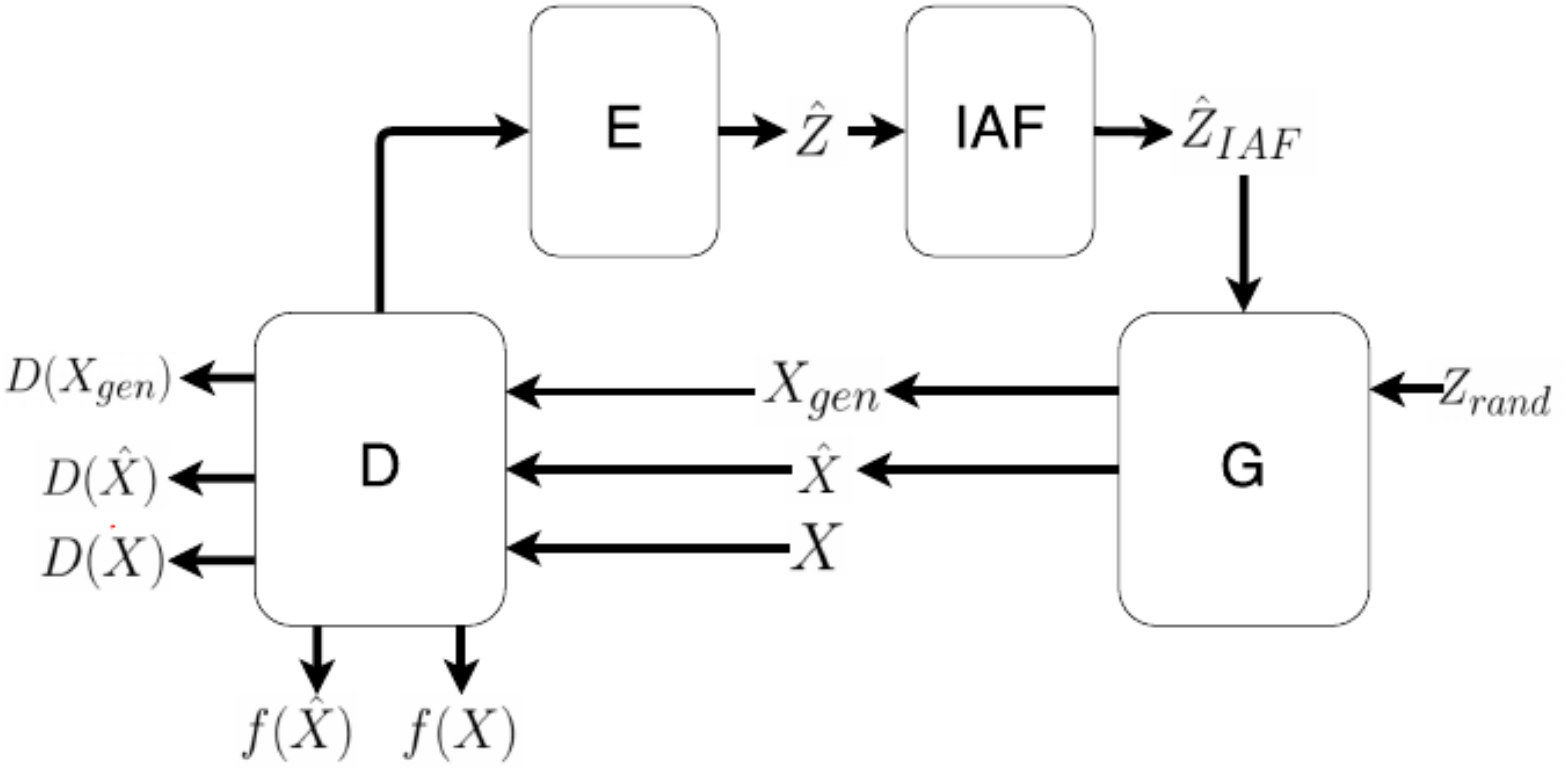


Figure 3: The Introspective Adversarial Network (IAN).

Multiscale Dilated Conv Blocks

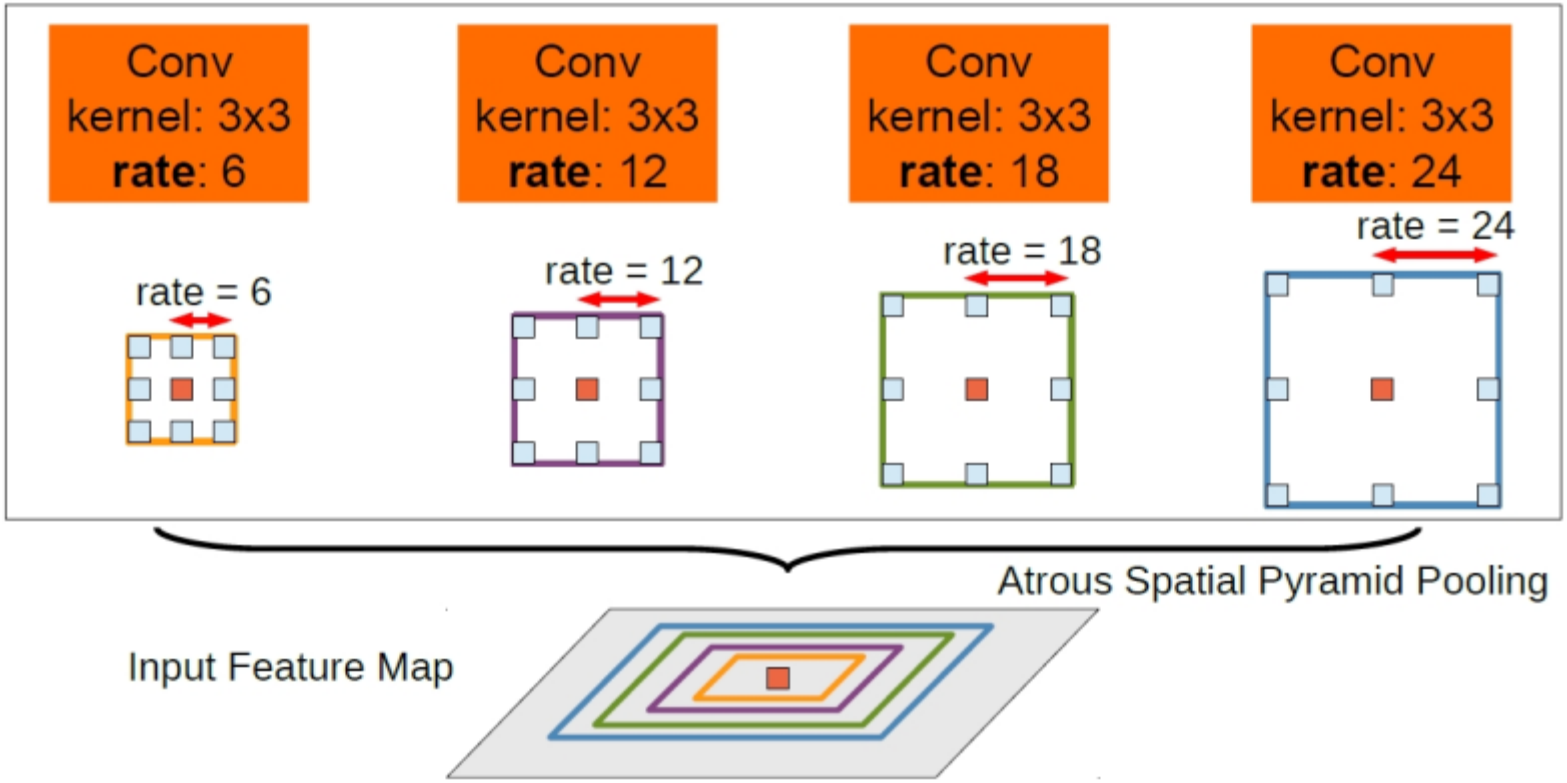
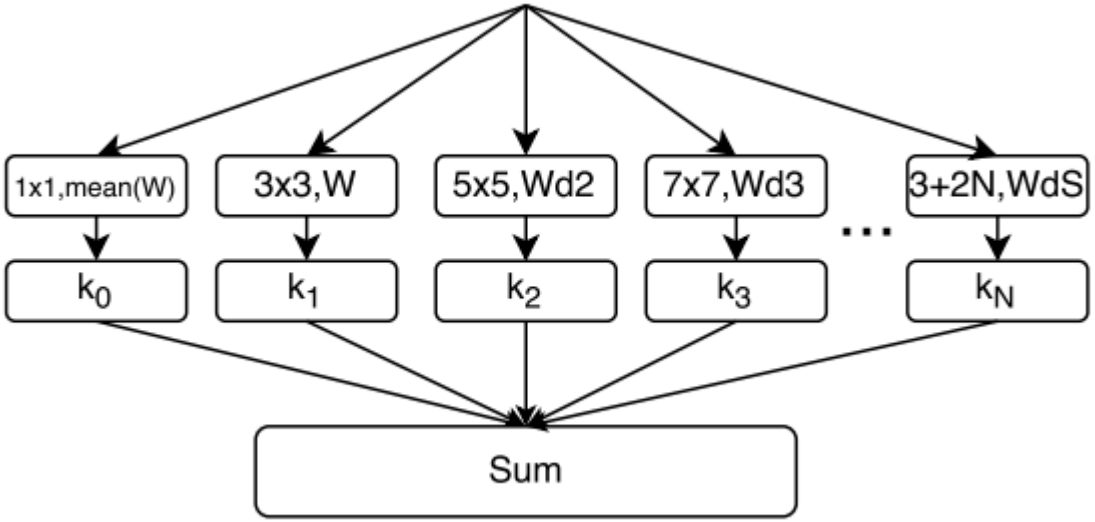


Image credit:
http://liangchiehchen.com/fig/deeplab_aspp.jpg

Multiscale Dilated Conv Blocks

Expressivity = range of functions a block can represent / number of parameters



Faster Dilation through Reshapes

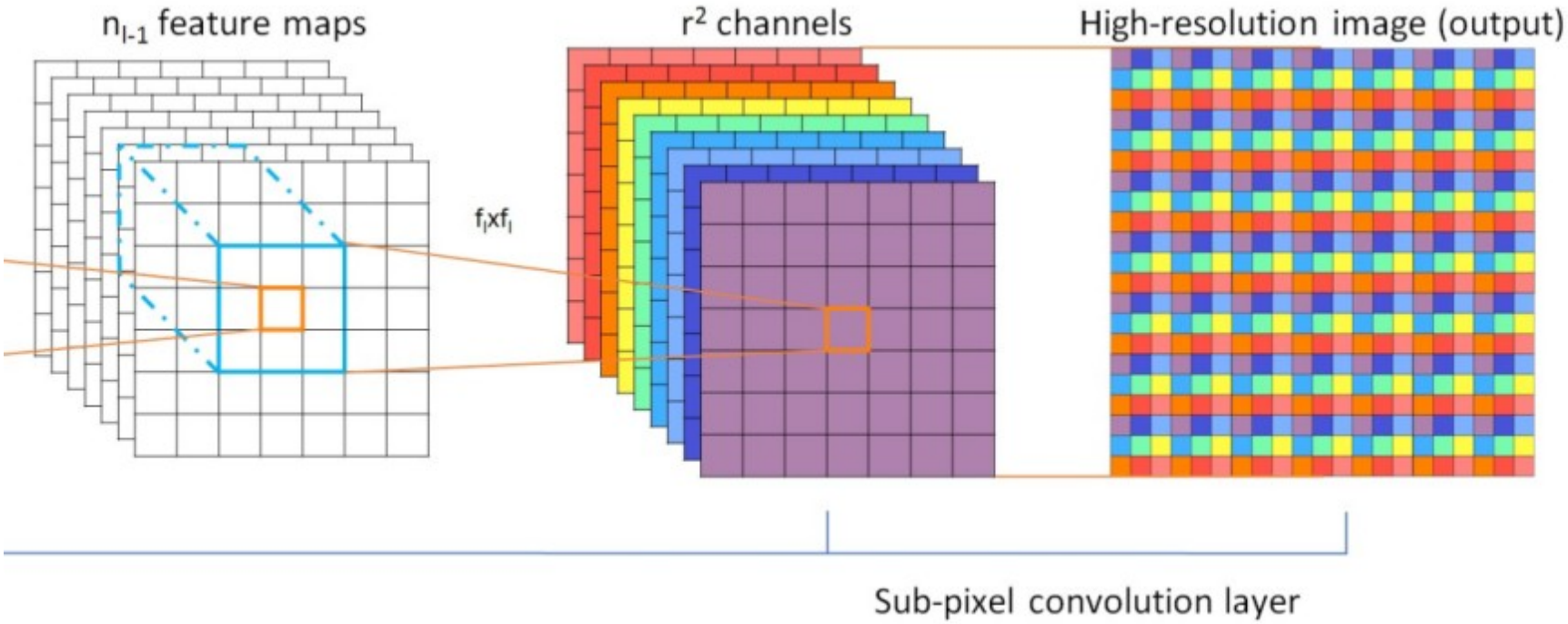


Image credit: Real-Time Single Image and Video Super-Resolution Using an Efficient Sub-Pixel Convolutional Neural Network, Twitter Cortex

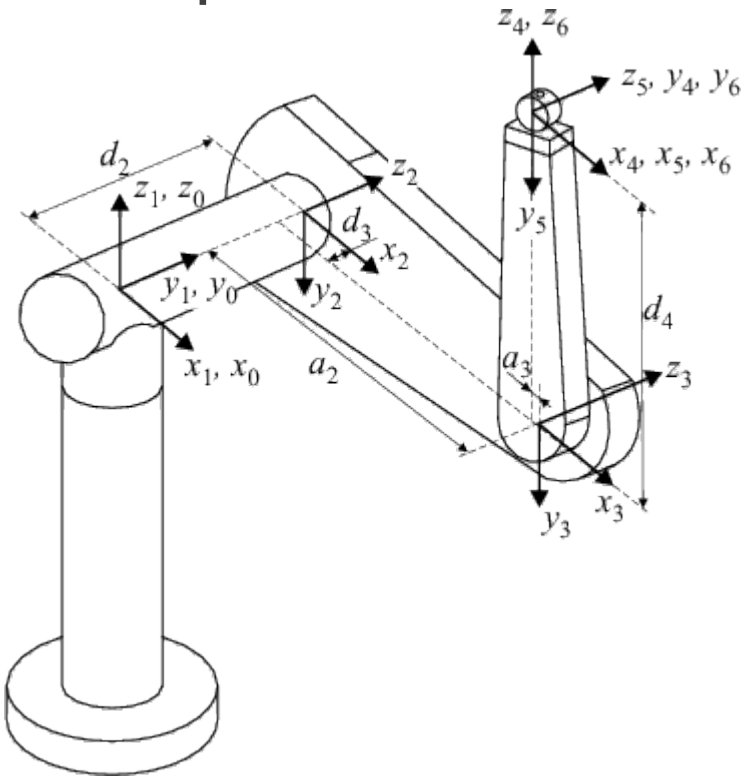
Orthogonality

Initializing weights with orthogonal matrices works well...so why not keep them orthogonal?

$$R_x(\theta) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$$

$$R_y(\theta) = \begin{bmatrix} \cos\theta & 0 & \sin\theta \\ 0 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{bmatrix}$$

$$R_z(\theta) = \begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$$



Orthogonal Regularization

Initializing weights with orthognal matrices works well...so why not keep them orthogonal?

$$\mathcal{L}_{ortho} = \Sigma(|WW^T - I|)$$

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Adding Modifications

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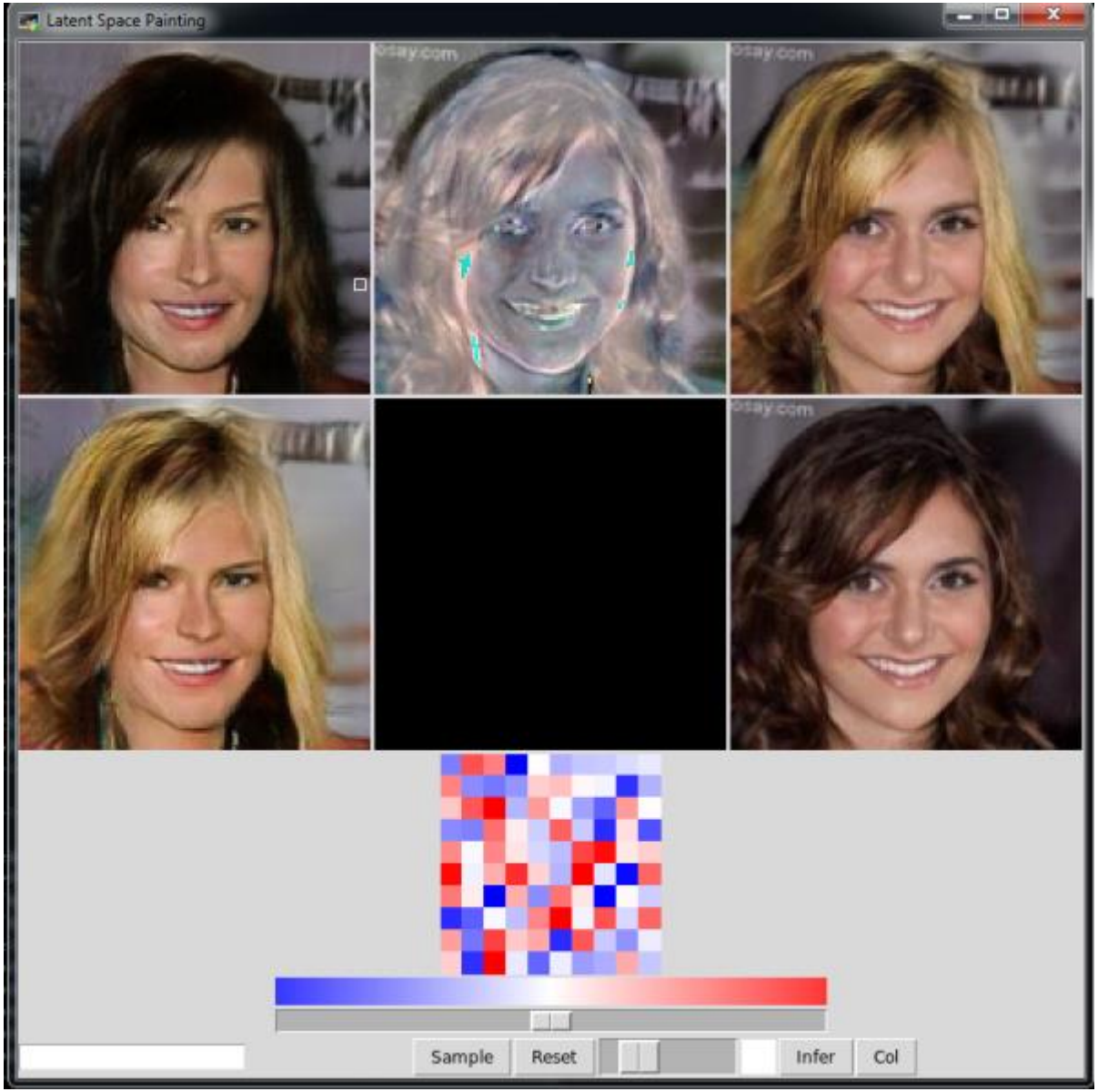

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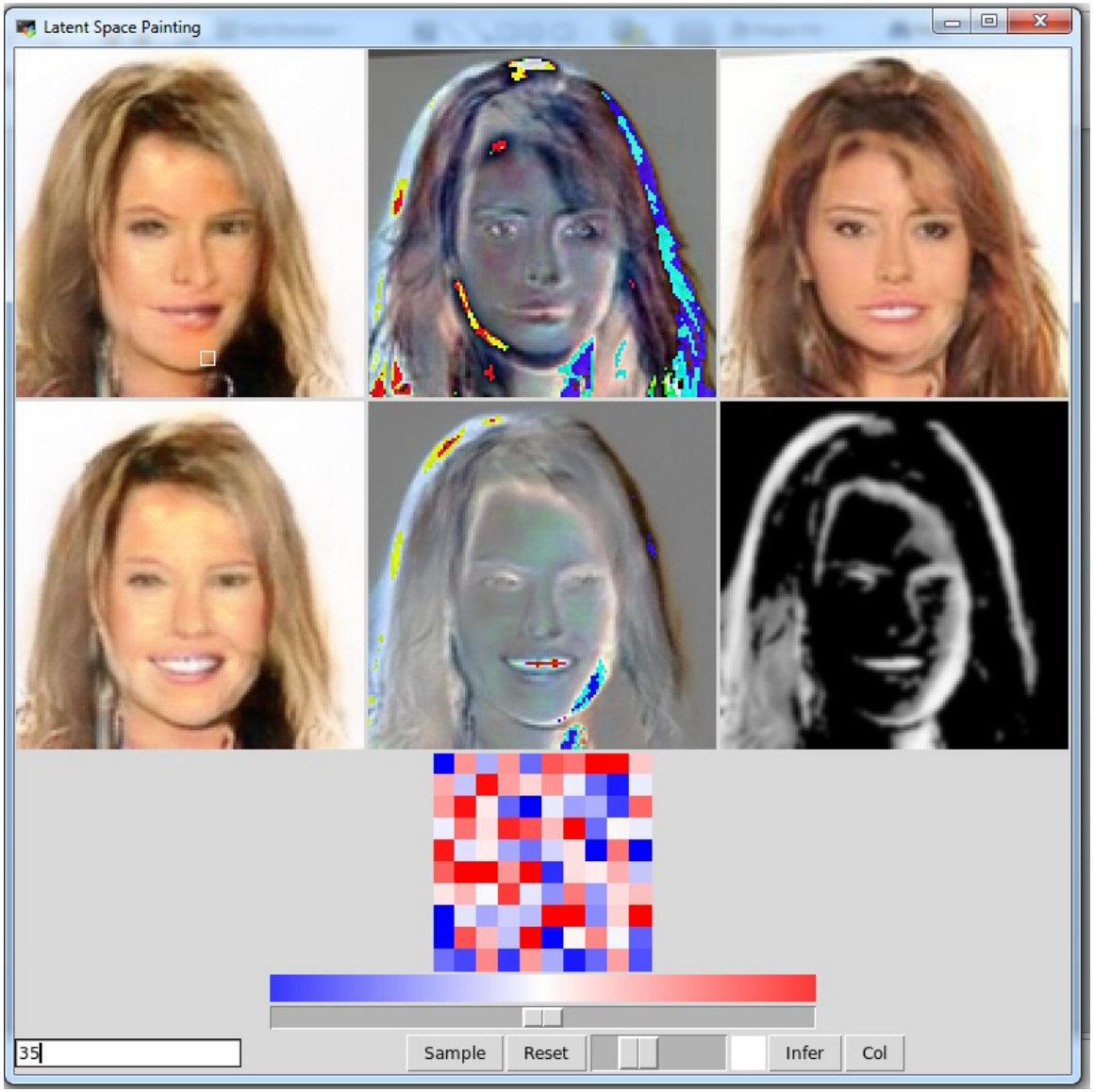
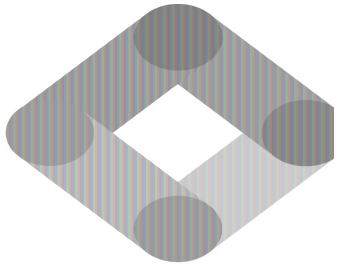


Thanks!



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