# Artistic Style Transfer

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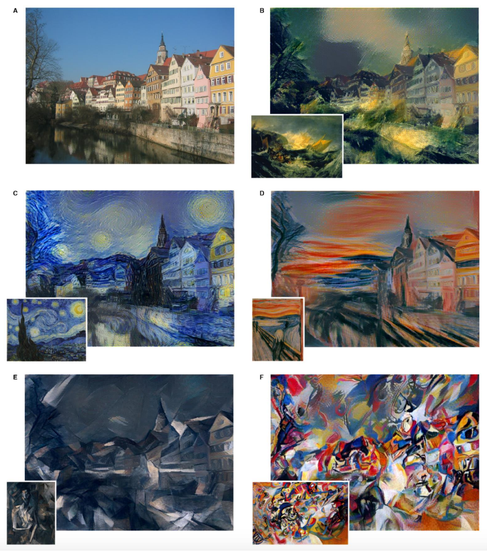
## Motivation

Using a biologically inspired vision model, called “Deep Neural Networks,” an artificial system can be trained to learn different styles of painting and subsequently recreate images rendered in that style.

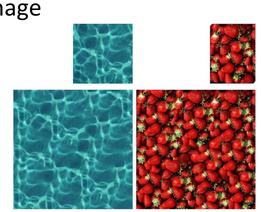
The model is successful because it is able to distinguish between “style” vs. “content”, and merge the two.

*Source: L.A. Gatys, A.S. Ecker, and M. Bethge, Image Style Transfer Using Convolutional Neural Networks, CVPR, 2016.*



## Related Work

Using a modification of Texture-Synthesis it is possible to get fast and comparable style-transfer results. This method focuses on separating information-poor areas to hallucinate the style and high content areas where it keeps the original image



*Source: M. Elad, P. Milanfar, Style-Transfer via Texture-Synthesis, Google Research, September 21, 2016*

*Source: V. Kwatra, I. Essa, A. Bobick, and N. Kwatra, Texture Optimization for Example-Based Synthesis,ACM ToG, Vol. 24, No. 3, pp. 795-802, 2005*

## Algorithm Overview

**Input:**

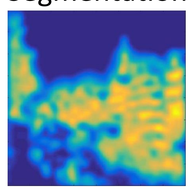
Content Image

Style Image

Hallucination

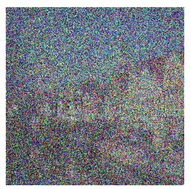
**Initialization:**

Segmentation



Color transfer

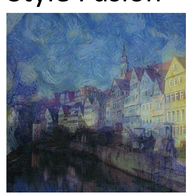
Add noise



**Loop over scales:**

**Loop over patch sizes:**

Style Fusion



Patch Matching

Style Synthesis

Content Fusion

Color Transfer

Denoise

Resize Patch

Resize Estimate (finer scale)

## Experimental Results


Chosen parameters: 3 scales, 2 patch sizes (except smallest scale uses 3 patch sizes), 10% NN noise, 25%+75% hallucination averaging

Hallucination percentage influence :