

Turning Photographs into Abstract Expressionist Paintings

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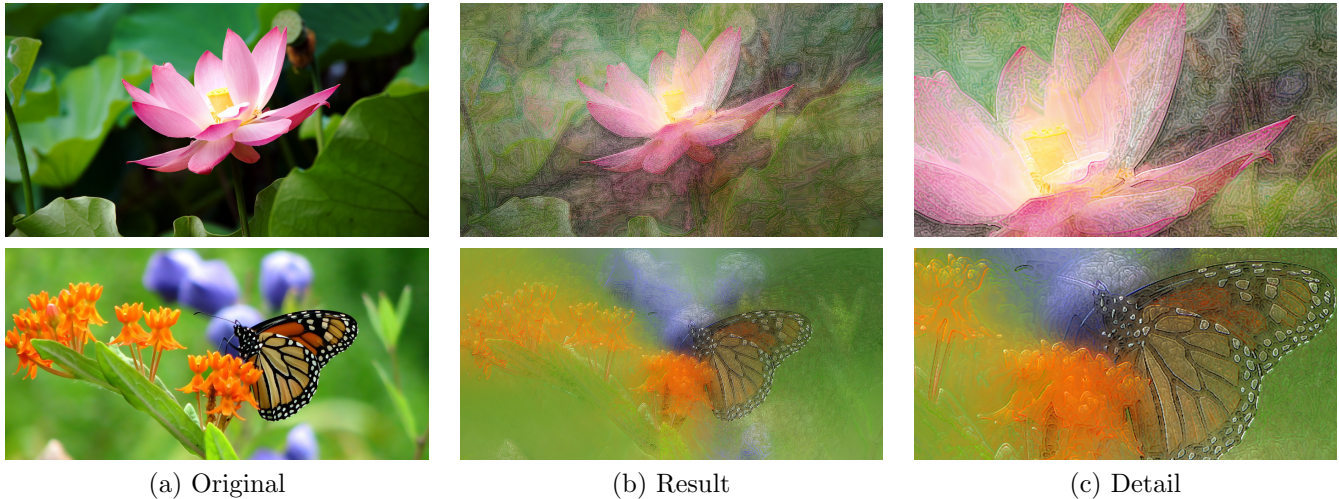


Figure 1: Two examples of paintings obtained from photographs using successive application of Fretwork operator. This operation makes image flatter, but increase local variances as shown in close-up images.

During the recent history of painting there has been several movements who tried to obtain an illusion of flattened 3D space. Cubists employed multi-perspective views to flatten the 3D space [Meadows and Akleman 2000]. Impressionists and abstract expressionists, on the other hand, flattened 3D space with layers of paints to make objects fuzzy. A particular paint layering technique is impasto, which is introduced by impressionist artists such as Claude Monet or Vincent VanGogh [Schaefer et al. 2008]. Another paint layering technique is drip painting, which is introduced by abstract expressionist Jackson Pollock [Taylor 1999]. Abstract expressionism became popularized throughout the 20th century with artists such as Robert Jay Wolff, Franz Kline, Willem de Kooning, Larry Rivers, and Robert Motherwell [Ross 1990]. Unlike Pollock, most abstract expressionist painters uses impasto to obtain flatten effect and further transform images from flattened 3D representational form to abstract. Many of the abstract expressionists painted layers upon layers of paint until they were satisfied with a result. For instance, in *Woman* by Willem de Kooning, we may make sense of a set of eyes and a mouth, but it is really through the name of the painting that we associate a human form with the image. This abstraction is obtained by applying paint in consistent impastos which thin out to the canvas in a few places while rising elsewhere to heavy ridges.

We present an approach to convert photographs into abstract paintings in a conceptually similar way to expressionist painting. The basic concept of our approach is simply keeping foreground high frequency regions while replacing foreground low frequency regions with background high frequency regions. To construct such images, we introduce an operator that creates holes in images by making low frequency regions transparent such that when combined with a

background image, low transparency regions will be replaced by the corresponding parts of background image. This operation, when applied only once, does not guarantee the removal of all low frequency regions since background image may also introduce some low frequency regions. However, if the operation is applied repeatedly using randomly transformed versions of background image, low frequency regions diminishes after a few iteration and the resulting images consist of mainly high frequency components.

By changing the hole sizes of the operator, we provide a consistent transition from flattened 3D representations to abstract ones. Small hole sizes results flattened 3D representations that resemble paintings such as Kooning's or a Monet's. On the other hand, the large hole sizes causes the forms in original photograph becomes unrecognizable resulting images that resemble abstract paintings such as Pollack's.

References

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