

# Artistic Sketching with a Painterly Rendering Algorithm

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**Figure 1:** *Painting of a rose (left), and its corresponding sketch (right).*

**CR Categories:** I.3.4 [Computer Graphics]: Graphics Utilities—Paint Systems

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## 1 Introduction

Hand-drawn sketches often depict geometry, colour and texture using loose and roughly drawn lines. Many automated sketching algorithms focus on accurately depicting salient details using pen-and-ink drawings. The approach of Hertzmann et. al. [2000] sketches the contours and silhouettes of 3D meshes, while the interactive algorithm of Kalnins et. al. [2002] renders decorative lines with artistic brushes and suggestions. Other 2D algorithms render Sobel and Canny edges with artistic brushes [Orzan et al. 2007].

Sketches produced by these approaches often appear rigid because they precisely depict shape at the expense of artistic stylization. In this article we present a sketching algorithm that creates relaxed, loose and flowing sketches from 2D images by selectively rendering portions of the vector field. Our method reproduces contours, silhouettes and textures from the source image while favouring artistic rendition and stylistic flexibility over accurate depiction.

## 2 Approach

To create a sketch, we use Hertzmann’s painterly rendering algorithm to generate layers of brush strokes that follow the vector field of the Gaussian-blurred input image. We then draw one-pixel wide curves along each stroke.

This layer-based approach progressively refines salient regions of the input image, emphasizing contours, silhouettes and textures in

the output sketch. The refining process concentrates sketch lines along edges, producing an overdrawn appearance common to many sketching styles.

Hertzmann’s painterly rendering algorithm endows our sketching method with stylistic control and flexibility in several ways. Alterations to the vector field and painterly rendering parameters (e.g. stroke length, brush width, tolerance) provide control over the flow and placement of sketch lines. Filtering out certain brush stroke layers in the painting emphasizes artistic properties in the sketch. Also, rendering the sketch lines with artistic brushes simulates a variety of media (e.g. coloured pencils, charcoal, crayon).

## References

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