DAB: Interactive Haptic Painting with 3D Virtual Brushes

Motivation
Recent advances in computer graphics have made progress with reproducing the look of painting. This project explores the benefits of recreating the “sight, touch, action and feeling” of the artistic process itself.

Our system, DAB, provides the user with the traditional tools of a painter. This setting, conceptually equivalent to a real world painting environment, allows anyone to control a virtual brush as he or she would a real brush.

To achieve this, we have designed a physically based, deformable, 3D brush model and bi-directional, two-layer, paint model. These allow the user to produce complex brush strokes intuitively. The haptic feedback enhances the sense of realism and provides tactile cues that enable the user to better manipulate the paint brush.

Paint Model
Complementing our expressive brushes, we present a paint model capable of capturing complex effects interactively. Our paint model incorporates variable wetness and opacity, conservation of volume, and a hardware-accelerated bi-directional paint transfer algorithm. It supports the following operations and techniques expected from acrylic or oil painting: blending, bi-directional transfer, complex brush loading, variable dryness, glazing, and impasto.

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
<th>Model</th>
<th>Structure</th>
<th>Surface</th>
<th>Example Strokes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round</td>
<td><img src="image1" alt="Examples" /></td>
<td><img src="image2" alt="Model" /></td>
<td><img src="image3" alt="Structure" /></td>
<td><img src="image4" alt="Surface" /></td>
<td><img src="image5" alt="Example Strokes" /></td>
</tr>
<tr>
<td>Flat/Bright</td>
<td><img src="image6" alt="Examples" /></td>
<td><img src="image7" alt="Model" /></td>
<td><img src="image8" alt="Structure" /></td>
<td><img src="image9" alt="Surface" /></td>
<td><img src="image10" alt="Example Strokes" /></td>
</tr>
<tr>
<td>Filbert</td>
<td><img src="image11" alt="Examples" /></td>
<td><img src="image12" alt="Model" /></td>
<td><img src="image13" alt="Structure" /></td>
<td><img src="image14" alt="Surface" /></td>
<td><img src="image15" alt="Example Strokes" /></td>
</tr>
</tbody>
</table>

Examples of real brushes, our model for each, and example strokes.
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Selected Publications

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Haptics; human-computer interaction; painting systems; applications

For More Information
www.cs.unc.edu/~geom/DAB/

Paintings created with DAB by:
Rebecca Holmberg
Lauren Adams
Eriko Baxter
William Baxter
Sarah Hoff
Andrei State

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