Render the Possibilities

SIGGRAPH 2016

THE 43RD INTERNATIONAL CONFERENCE AND EXHIBITION ON

Computer Graphics & Interactive Techniques

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ANAHEIM, CALIFORNIA
Digital Painting Classroom
Learning Oil Painting Using a Tablet

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Can a digital tool help novice users learn the fundamentals of oil painting?
Can a digital tool help novice users learn the fundamentals of oil painting?

Why?
Motivation: Why digital?
Design goal

A believable digital tool that experienced artists want to use away from their art studios to experiment
Design goal

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NOT a replacement for real oil paint
Oil Paint

Very complex

- Pigments
- Dilution
- Brushes

- Sponges and Cloth
- Palette knife
  
- ...
Main Features

• Dynamic paint behavior
• Multi-layer pigment structure
• Gravity set by tablet orientation
• Environment integration
• Adaptive lighting
Dynamic simulation

Pigment

Thinner
Dynamic simulation

Pigment

Thinner
Dynamic simulation

Pigment

Thinner
Dynamic simulation

Pigment

Thinner
Dynamic simulation
Multi-layer pigments
Multi-layer pigments
Varying gravity direction
Environment integration
Adaptive Lighting
Supported Paint Styles

• Wet on wet
• Wet on dry
• Impasto

• Scumbling
• Dry brush
User Study

Importance of individual features in the digital implementation
User Study

13 participants where asked to rate:

1. The importance of individual features in the digital implementation

2. Usability

3. Digital painting experience
User Study

Feature evaluation

Varying Lights: 3.6 ± 0.8
Environment: 3.7 ± 0.8
Varying Gravity: 4.2 ± 1.0
Dynamic Paint: 4.5 ± 0.5
Multi-Layer Pigments: 4.5 ± 0.5
System Usability Scale

84 ± 7 / 100
High perceived usability

**Highlights:**
- Easy to get started
- Well integrated features
<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found the experience enjoyable</td>
<td>4.6 ± 0.5</td>
<td>5</td>
</tr>
<tr>
<td>2. Testing ideas is helpful</td>
<td>4.1 ± 0.6</td>
<td>4</td>
</tr>
<tr>
<td>3. I would use this system for testing ideas</td>
<td>4.2 ± 1.0</td>
<td>4</td>
</tr>
<tr>
<td>4. This system would allow me to paint more efficiently</td>
<td>3.8 ± 0.6</td>
<td>4</td>
</tr>
<tr>
<td>5. I found the digital oil painting experience believable</td>
<td>4.2 ± 0.5</td>
<td>4</td>
</tr>
<tr>
<td>6. I would use this to make complete virtual paintings</td>
<td>3.2 ± 1.5</td>
<td>3</td>
</tr>
</tbody>
</table>
User Study

What we learned:

• No replacement for oil paint
• Believable and helpful for experimentation
• Complementary tool
• Ease of use
• On the go
Limitations

• Limited brush behaviour

• Missing tools such as cloth or sponges
Can a **digital tool** help **novice users** learn the fundamentals of **oil painting**?
Learning oil painting

Application that guides users through the beginner concepts in a playful way

Chapters:

1. Introduction to Oil Paint
2. Color Tint and Tone
3. Creating a Painting
Chapter 1: Paint

Oil paint basics and background information:

• Importance in history
• Pigments
• Color intensity

• Opacity
• Thinner fluids
• Dry and Wet
Chapter 1: Paint

Oil paint basics and background information:

- Importance in history
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- Dry and Wet

Experimentation
Chapter 2: Color Tint and Tone

Proposed exercises:

- Color wheel
- Color gradient
- Experimenting with subtractive colors
Tint or Tone?
Color Wheel

Exercise:
Recreate a color wheel given a limited set of pigments

Goal:
• Understanding subtractive colors
• Matching colors
Color Gradient

Exercise:
Recreate a color gradient

Goal:
• Encourage experimentation with lightening and darkening colors
• Understanding color tone and seeing value in colors
Progress Evaluation

Evaluation:

• Instructor feedback
• Self-evaluation given reference
Chapter 3: Creating a Painting

How to make a painting:

• Background to foreground
• Thin layers to thick paint
• Composition
• Shadow
• …
Chapter 3: Creating a Painting
Proposed exercises:

• Imitating the masters
• Experimentation
Chapter 3: Creating a Painting
Chapter 3: Creating a Painting

Van Gogh would be proud...?
Can a **digital tool** help **novice users** learn the fundamentals of **oil painting**?
Conclusions

• Is useful for learning basic techniques and understanding fundamental concepts

• More thorough user evaluations over a prolonged period of time are necessary in order to assess user progression
Conclusions

• Is useful for learning basic techniques and understanding fundamental concepts

• More thorough user evaluations over a prolonged period of time are necessary in order to assess user progression

• Currently in progress
Conclusions

• Is useful for learning basic techniques and understanding fundamental concepts
• Will not replace a teacher
• Will not replace painting
• Lowers the barrier to painting
Conclusions

Experimentation

Encourage users to try out real oil paint
Special thanks to

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Thanks to all the artists who provided us with valuable feedback
Questions?

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