Paint by Numbers: Abstract Image Representation
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Impressionism

- 19th Century art movement
- Emphasizes light movement with visible brush strokes
- Use of fewer strokes and primary colors, concentrate on “Impression” of a scene
- Communicate abstract image scenes to the viewer

Claude Monet
Camille Pissarro
Fewer brush strokes without modelling object detail.
Introduction

- Computer graphics are photorealistic images of objects
- Alternative is to create abstract images which looks like impressionist art
- Goal: Take realistic image and create abstract impressionist art.
Simple Technique

- Take a regular photo image and convert into impressionist image
- Want to make it easy for the user to create many different representations
- Create brush strokes to represent the original image
- Art image is an ordered set of brush strokes.
Our Goal
Creation

- **Pixel color under mouse pointer** is continuously sampled.
- **User selects brush shape, direction, size.**
- **Brush size also decided by speed of mouse movement.** Fast = larger brush size.
- **On Mouse click, an image of the brush stroke is drawn**
- **Smaller brush strokes used for detailing**

Stochastic distribution of brush strokes ie randomly
Makes it easy to paint since it samples the color under mouse position automatically
Detailing

- *Shape and size of brush strokes heavily influences the final image*
Advanced Operations

- Advanced effects can be applied to paintings
  - Map brush strokes to light gradient directions for greater realism
  - Create own brush stroke from a real brush stroke
  - Ray Painting: Represent Ray Tracing Images using brush strokes
Using a light gradient
Sampled Brush Stroke
Ray Painting
Conclusions

- **Goal:** Not to make photo realistic images, instead abstract art representations

- **Image programs effects extrapolate upon this basic technique**

- **Techniques also used as filters and tools e.g. Brush Stroke filters in Photoshop® and clone brush tool.**
Photoshop Brush Filters