Lab12 Mondrian (11.18.19) CS103 Fall 2019

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materials

- *lab12_19fa103_mondrian.pdf* (this document)
- *lab12_19fa103.py*
- examples of Piet Mondrian's art in the img folder

purpose

goal draw in the style of Mondrian using turtle graphics

- code creatively
- practice algorithm design
- explore turtle graphics, especially rectilinear structure and colour
- explore randomization

context

Here are some references on generating art in distinctive styles, such as Renoir or van Goph.

- Michael Salisbury, Sean Anderson, Ronen Barzel and David Salesin. **Interactive Pen-and-Ink Illustration**.} SIGGRAPH 1994.
- Aaron Hertzmann. **Painterly Rendering with Curved Brush Strokes of Varying Sizes**. SIGGRAPH 1998.

Here are some references on nonphotorealistic rendering, which is more akin to the technique used by artists.

- Forrester Cole et. al., **Where Do People Draw Lines?**, ACM Transactions on Graphics 27(3), Article 88, August 2008 (SIGGRAPH 2008). **in ACM Digital Library**
- Szymon Rusinkiewicz, Forrester Cole, Doug DeCarlo, Adam Finkelstein. **Line Drawings from 3D Models**. SIGGRAPH 2008 course.
- Aaron Hertzmann and Denis Zorin. **Illustrating smooth surfaces.** SIGGRAPH 2000.
- Doug DeCarlo, Adam Finkelstein, Szymon Rusinkiewicz, Anthony Santella. **Suggestive Contours for Conveying Shape**, SIGGRAPH 2003.

All of these papers appeared at SIGGRAPH, the top computer graphics conference. Note that all SIGGRAPH papers are available in the ACM Digital Library: go to **library.uab.edu**, search for 'ACM Digital Library' under Databases, search for 'SIGGRAPH' under Proceedings or 'Transactions on Graphics' under Journals; or use the search tool for a specific paper using first author, paper title (movie of the talk is under Source Materials once you get to a paper page).

in-class exercise

- (30 minutes in) draw 5 randomized vertical lines

exercises

In this lab, you will design art in the style of Mondrian. Your code should include a function called Mondrian that takes no parameters and generates a (preferably random) piece of art in the style of Mondrian. I have given you several examples of Mondrian's art, which has a distinctive signature. Your goal is to use turtle graphics to draw a piece of art in the style of Mondrian. Optimally, your code should draw a different piece of art every time you run it (by using randomization).

Hints design functions to draw horizontal and vertical lines;
think about, and write down, your algorithm for building the art, before you code

Here is one approach: build the grid of lines, then fill in random cells.
First step is to build the grid.
Hint: choose the distances between horizontal lines randomly.
Second step is to choose random cells to draw in random colours.
You may choose a different approach if your creativity pushes you in a different direction.

challenges

Randomize your Mondrian art. Read one of the journal papers.

deliverables

A+: randomized Mondrian, and a discussion of the problem attacked by one of the SIGGRAPH papers and its approach to solving this problem (longer than a paragraph, shorter than a page)
A: Mondrian
B: in-class exercise
C: attendance