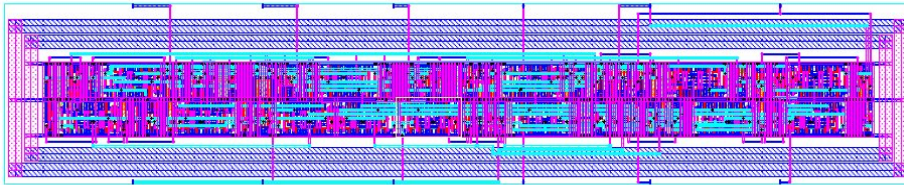


CS/ECE 5710/6710 Digital VLSI Design

VLSI Sketchbooks



VLSI Sketchbook

- ◆ I encourage you to try a sketchbook!
 - It should be at least 5x8"
 - It should be plain, unlined paper
 - Ideally it should be “nice” drawing/sketching paper
 - It doesn't have to cost very much
- ◆ Also colored pencils
 - These don't need to be fancy, but you'll need at least a few colors

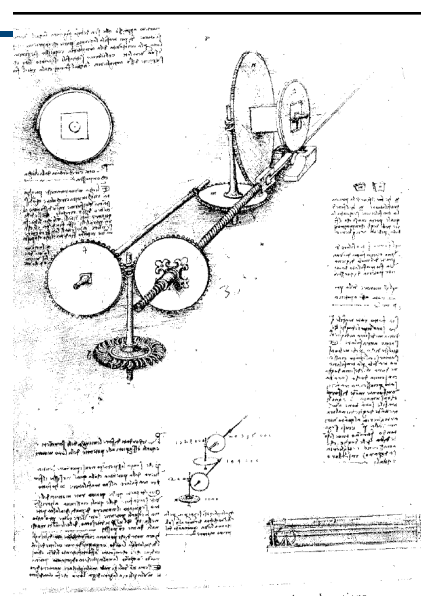
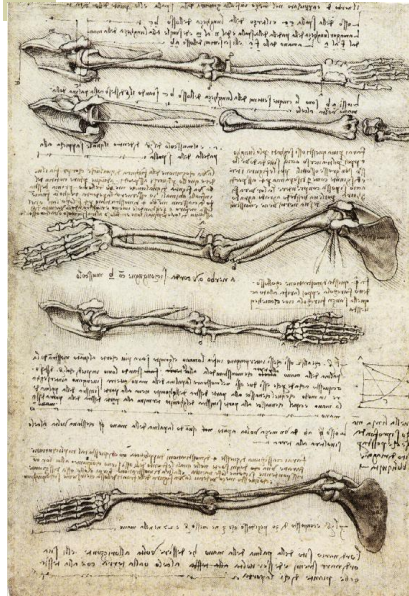
VLSI Sketchbook

- ♦ What types of things go in a sketchbook?
 - Sketches!
 - That means ideas, thoughts, things you see that you find interesting, things you see that remind you of engineering issues, random patterns, etc.
 - Some of my suggestions will seem unrelated
 - i.e. to look at artists' work that is “chip-like” and draw some examples of similar images
 - These are designed to get you thinking, and to loosen up your drawing/sketching skills

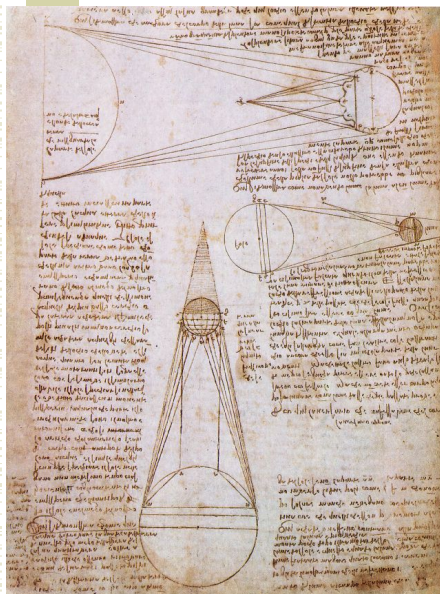
Sketchbook Examples



Leonardo



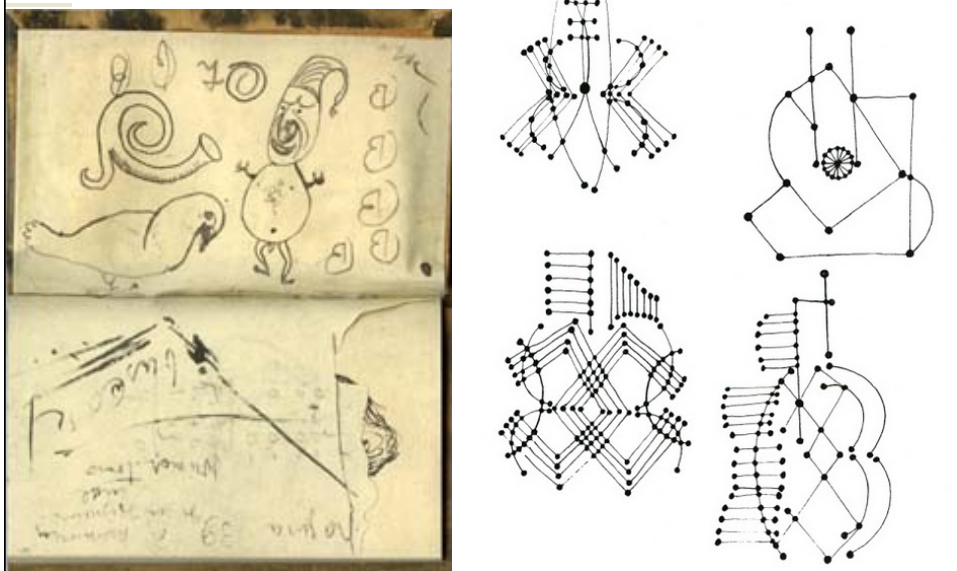
Leonardo



Picasso

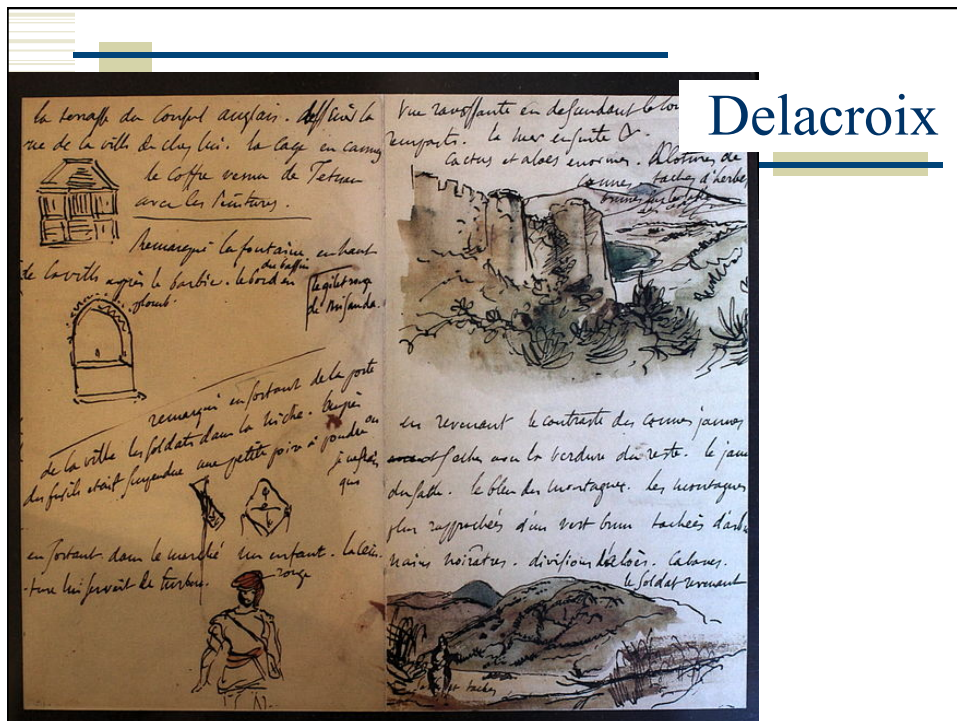


Picasso

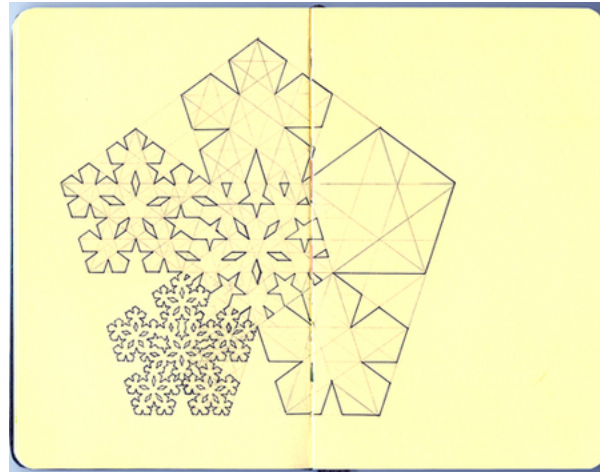




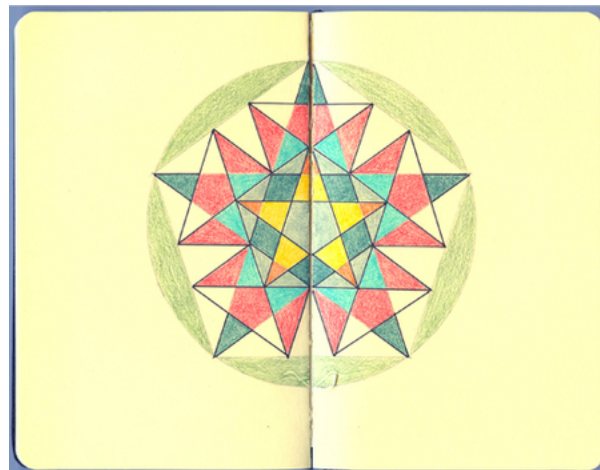
Delacroix



sketchingspirit.typepad.com



sketchingspirit.typepad.com



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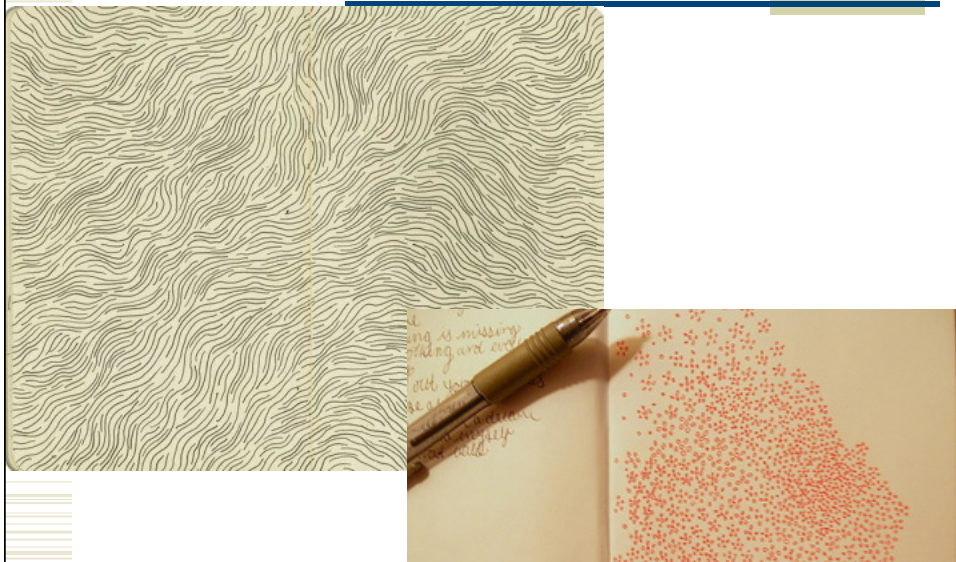
Lewis and Clark



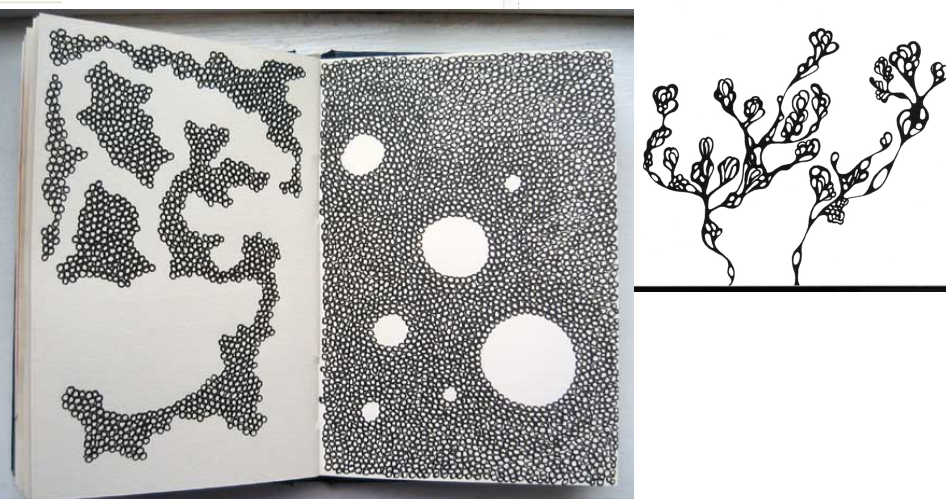
Lewis and Clark



Patterns and Shapes



Patterns and Shapes



My Sketchbooks

Drawing Machine Geometry

$$H_1 = \sqrt{x^2 + y^2}$$

$$H_2 = \sqrt{(x-1)^2 + y^2}$$

$$H_3 = \sqrt{x^2 + y^2}$$

$$H_4 = \sqrt{(x-2)^2 + y^2}$$

Left Stepper moves $H_3 - H_1 = \text{Delta C}$

Right Stepper moves $H_4 - H_2 = \text{Delta R}$

Number of L steps vs R steps during (x, y) to (x_2, y_2) drawing period is related to ratio of Delta C : Delta R somehow related to Bresenham?

Use Bresenham's algorithm to control when to take an X step vs. when to take a Y step.

Interpolation of Triangle Leg lengths

Start with Two deltas

- Delta X
- Delta Y

} belt length changes required to move drawing styles

Two motors - L & R

movements - L R	
1	2
2	1
2	2

Is it important for motors to turn at the same time?
Probably **NOT**

- Take larger (magnitude) Delta

- Interpolate smaller Delta steps during bigger steps

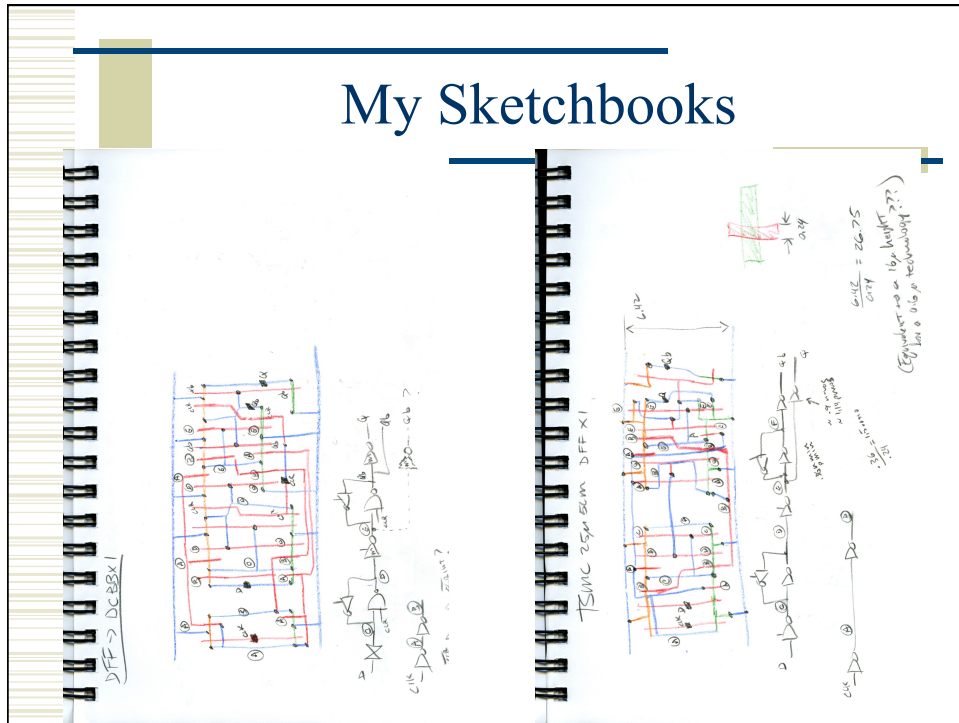
For $i = 0$ to $\min(\text{steps L}, \text{steps R})$
 { move L dir }
 if $\min(\text{steps L}, \min(\text{steps R}) - i = 0$
 { move R dir }
 if $\text{steps L} \neq 0$, move L dir;

Is there an advantage to turning motor Bresenham - like?

My Sketchbooks

My Sketchbooks

My Sketchbooks



Successful Sketchbooks

- ◆ Visual diaries
 - They should store personal responses including thoughts, ideas, and experiences
- ◆ Personal and unique
 - A collection of knowledge, thoughts, inspirations, that no one else has
- ◆ Near at all times
 - so ideas can be jotted down and drawings made whenever the situation allows

From a book on art education – I'll cite it as soon as I find it again...

Successful Sketchbooks

- ♦ Explore a variety of media
 - visual notes with written comments, drawings, work from direct observation and secondary sources
- ♦ Be inventive and experimental with media
 - Try out things you haven't used before
- ♦ Sketchbooks do not have to be neat or perfect
 - But they need to be legible and interesting to look at

From a book on art education – I'll cite it as soon as I find it again...

Sketchbook Gallery

- ♦ I've put some examples of sketchbooks in a gallery on the old class web site
 - <http://www.eng.utah.edu/~cs6710/Sketchbooks/sketchbooks.html>
 - Lots of other examples – we'll look at some in future classes