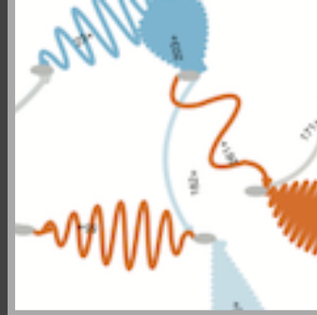
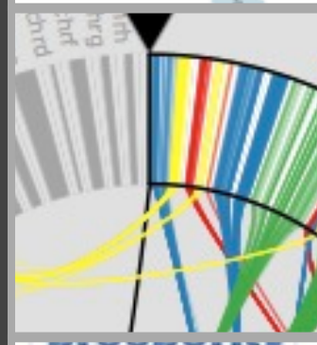
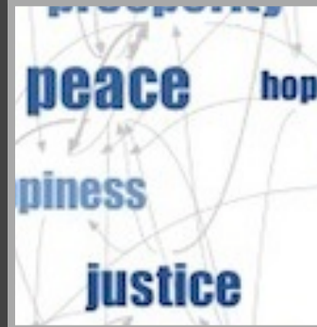
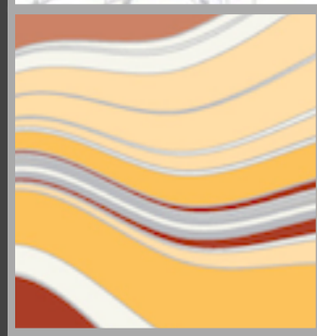
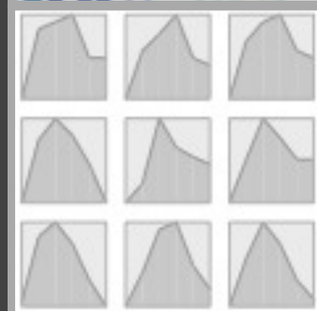
cs6964 | March 8 2012

TOOLKITS

Miriah Meyer
University of Utah





administrivia

feb 14-23 : proposal meetings

march 7 : presentation topics due

march 9 : proposals due

march 27-april 3 : project updates

april 5-24 : paper presentations

may 1 : final project presentations

may 3 : process books due

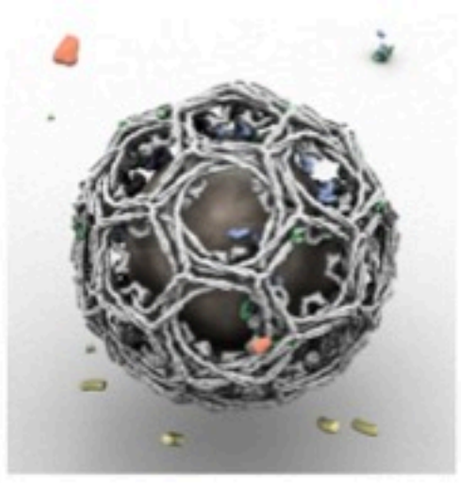
The Department of Neurobiology and Anatomy

PRESENTS

Janet Iwasa, Ph.D.
Department of Cell Biology
Harvard Medical School

"Animating the Model Figure"

In recent years, there has been a rapid growth in the use of animation as a means to communicate complex biological processes to a wide range of audiences. Using 3D animation software from the entertainment industry, we can now synthesize data from diverse data sources to create a coherent and contextualized view of how we think molecular and cellular systems operate. These visualizations have served not only to make molecular concepts more accessible to students and the public at large, but have also proven to be extremely useful for researchers seeking to build and refine their hypotheses.



Thursday, March 8, 2012

4:00 pm

EIHG Auditorium

last time...

MAPS

-**landmarks**

-**discrete data**

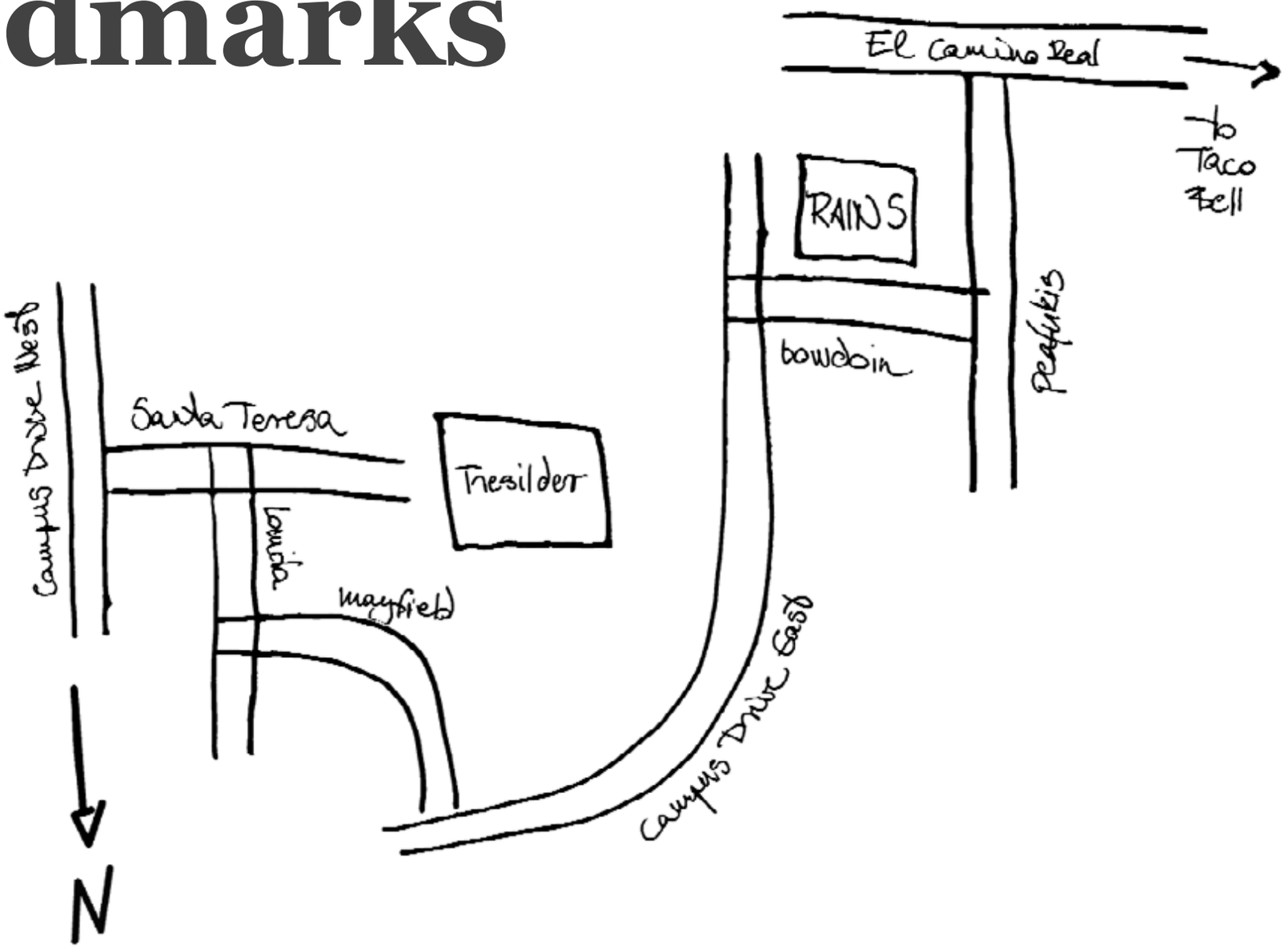
-**continuous data**

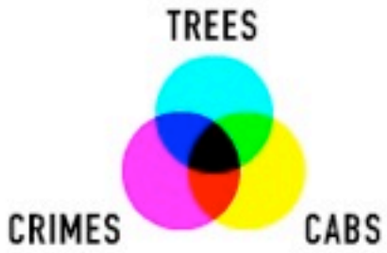
-**choropleths**

-**cartograms**

-**projections**

landmarks

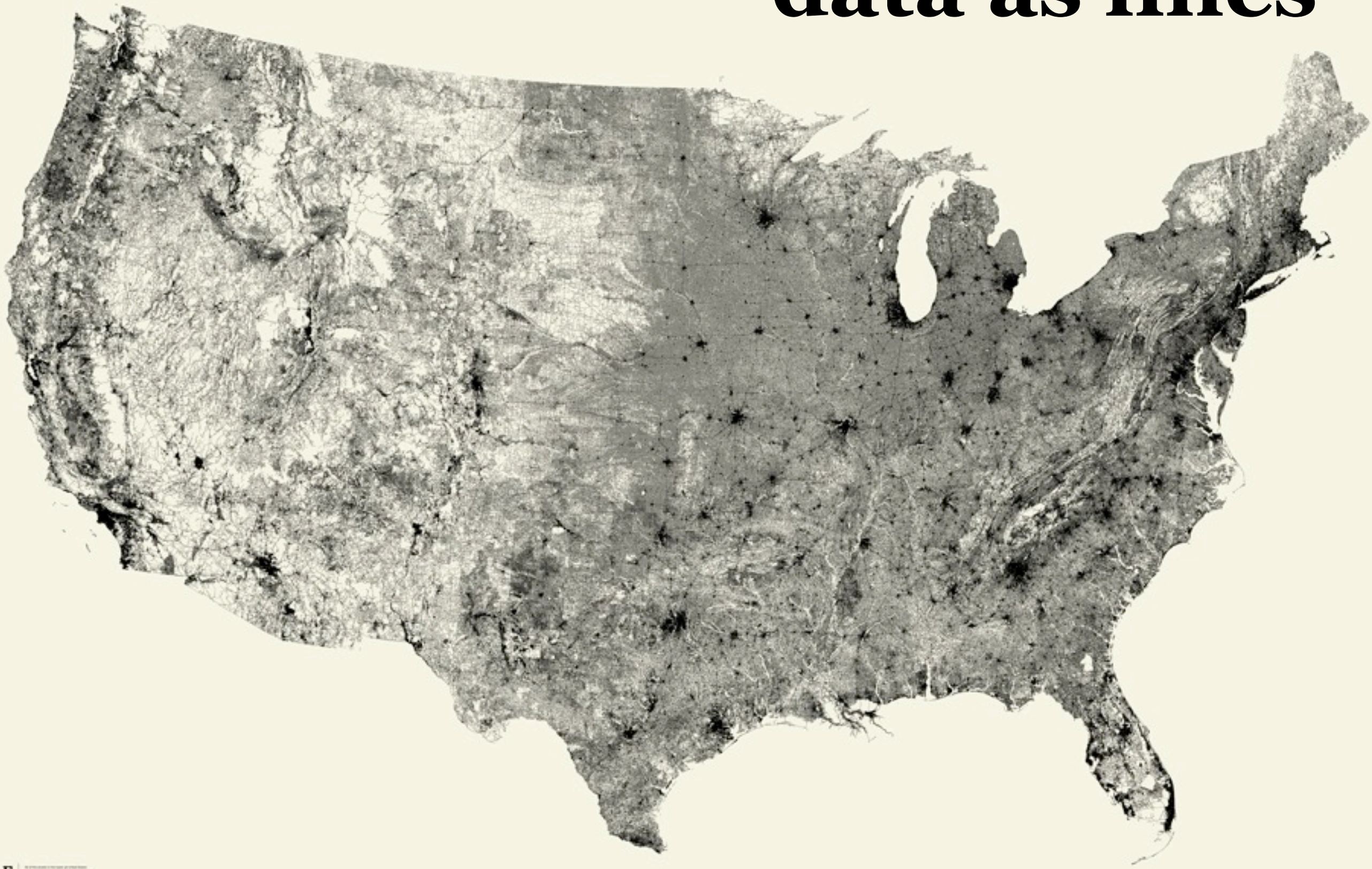

El Camino Real
to Taco Bell
RAINS
Peaflokis
bowdoin
Campus Drive West
Santa Teresa
Tresilder
lomita
mayfield
Campus Drive East
N



data as points

http://www.flickr.com/photos/shazbot/3282821808/in/set-72157614736071588/

data as lines



http://fathom.info/allstreets/

data as charts

Catch Composition

- SANDLANCE
- SALMON
- GADID
- SCULPIN
- FLATFISH
- SANDFISH
- OTHER

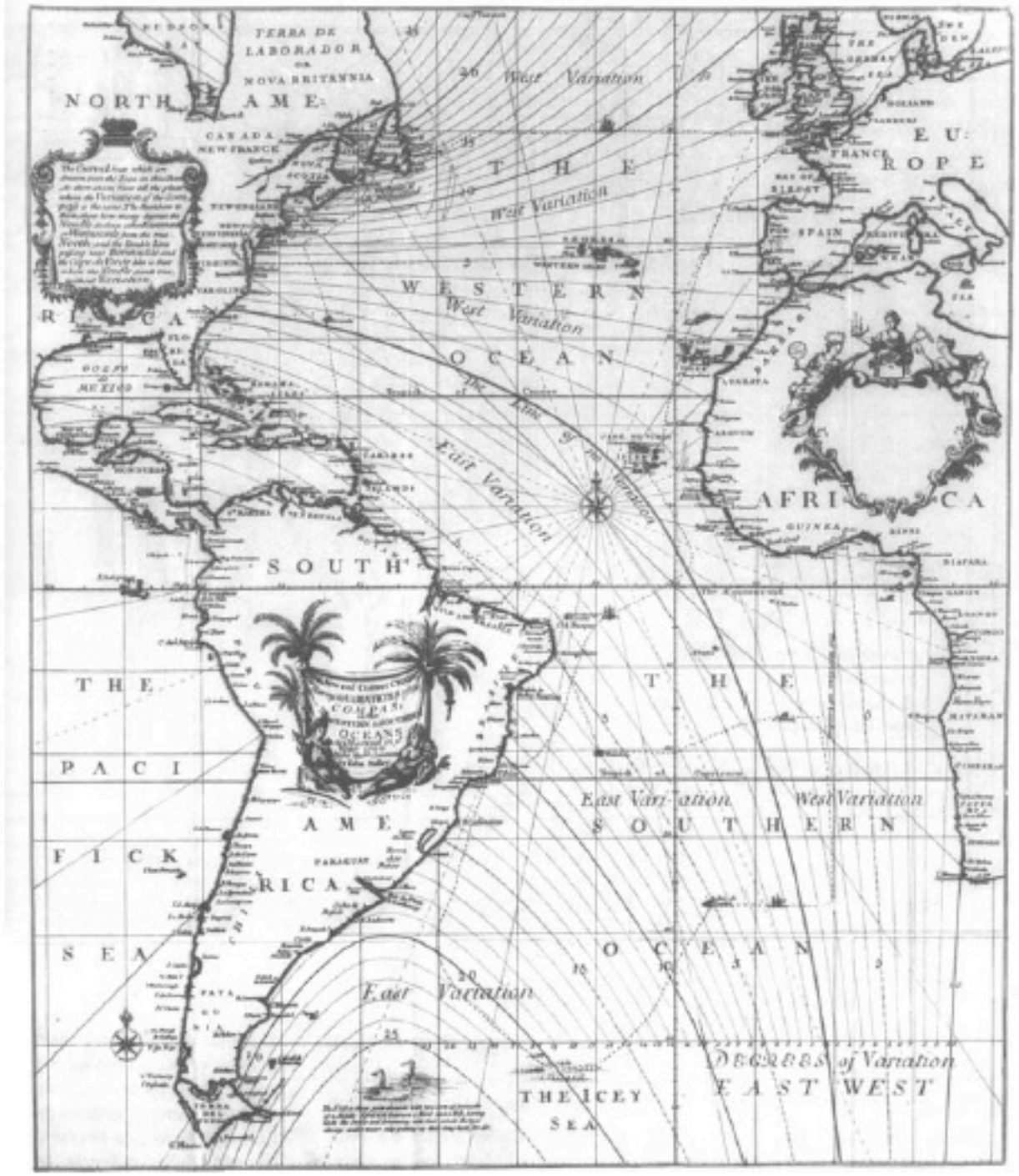
0 5 10 20 Km

http://alaska.usgs.gov/science/biology/seabirds_foragefish/foragefish/Aleutian/results.php

isopleth

map which overlays
continuous data using a
third encoding channel

Lines of Equal Magnetic Declination
first contour map

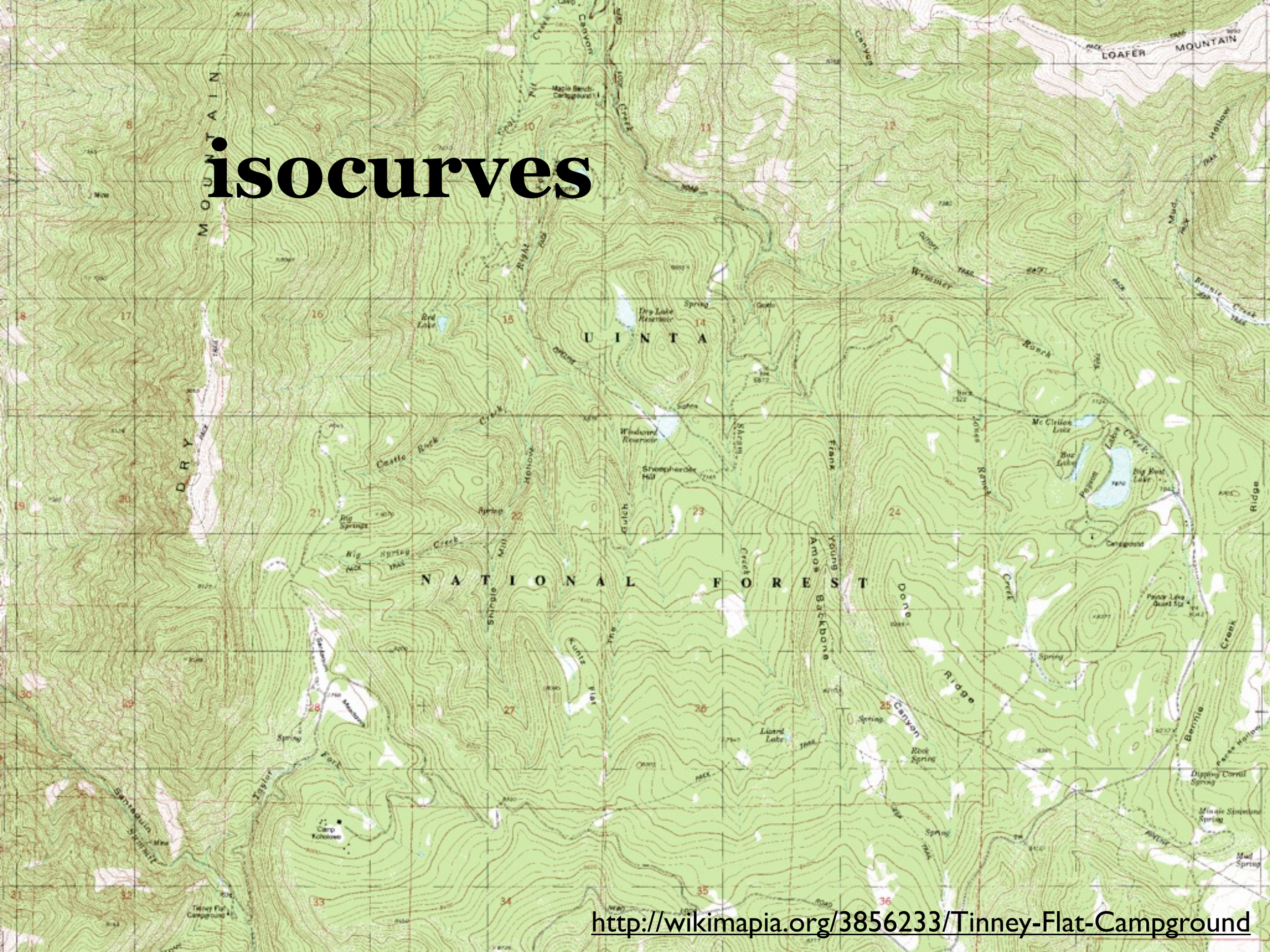


Edmond Halley, 1701

heatmaps

http://es.deister.net/es/solutions/ax-mobile/ax-mobile-components-maps/

isocurves

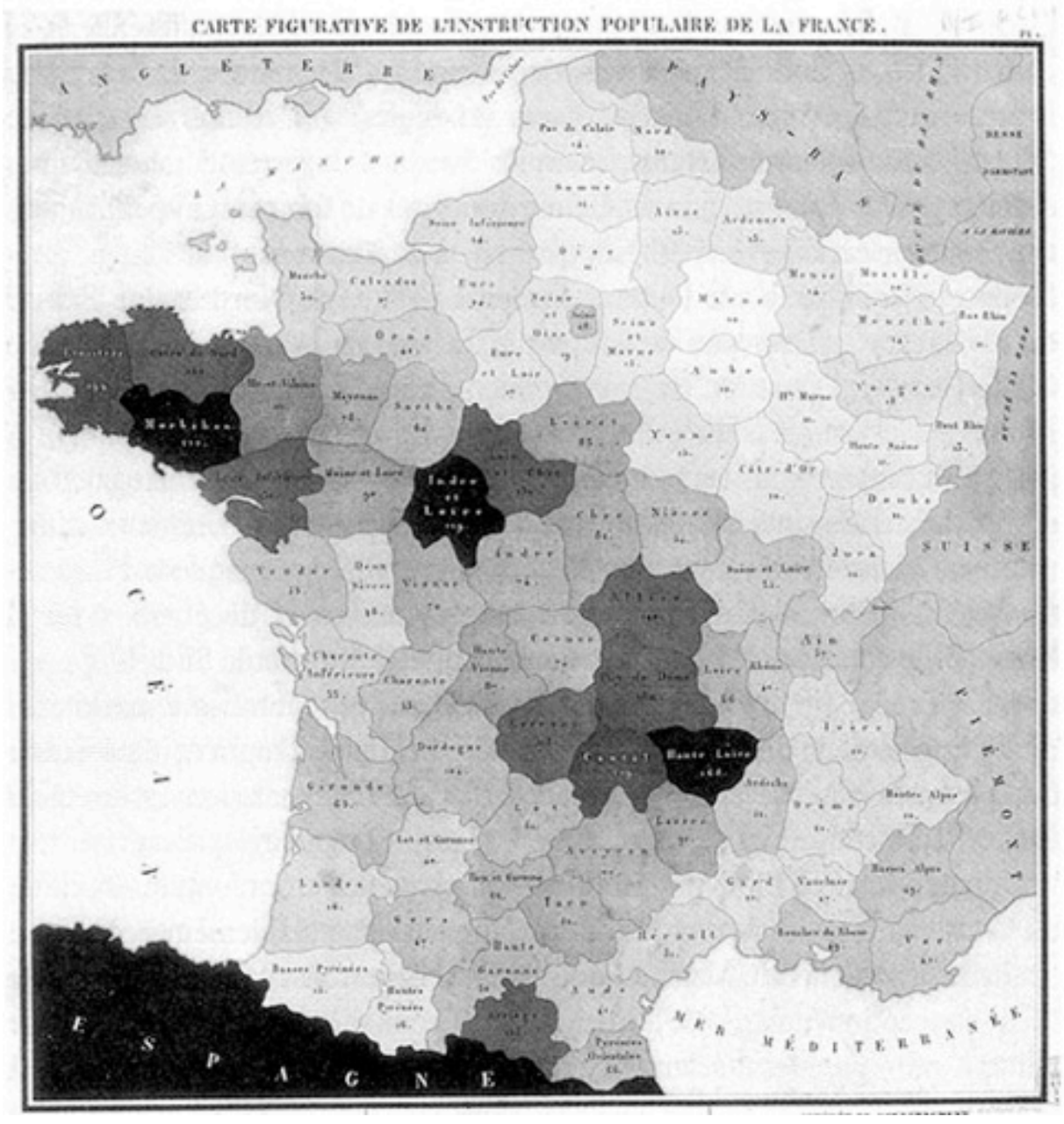


http://wikimapia.org/3856233/Tinney-Flat-Campground

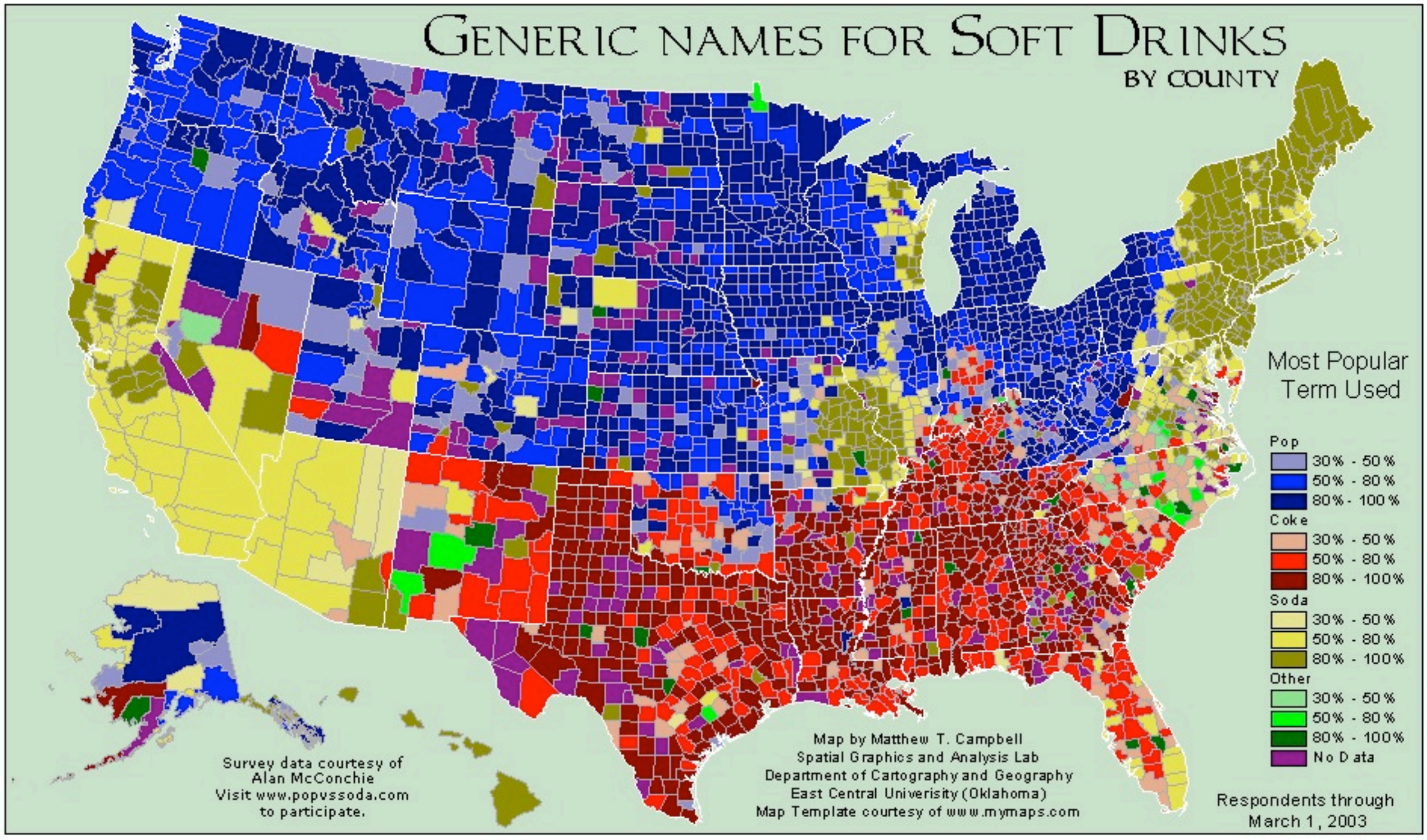
choropleth

map in which areas are shaded, colored, or patterned relative to a data attribute value

Illiteracy in France
first choropleth map



Charles Dupin, 1826

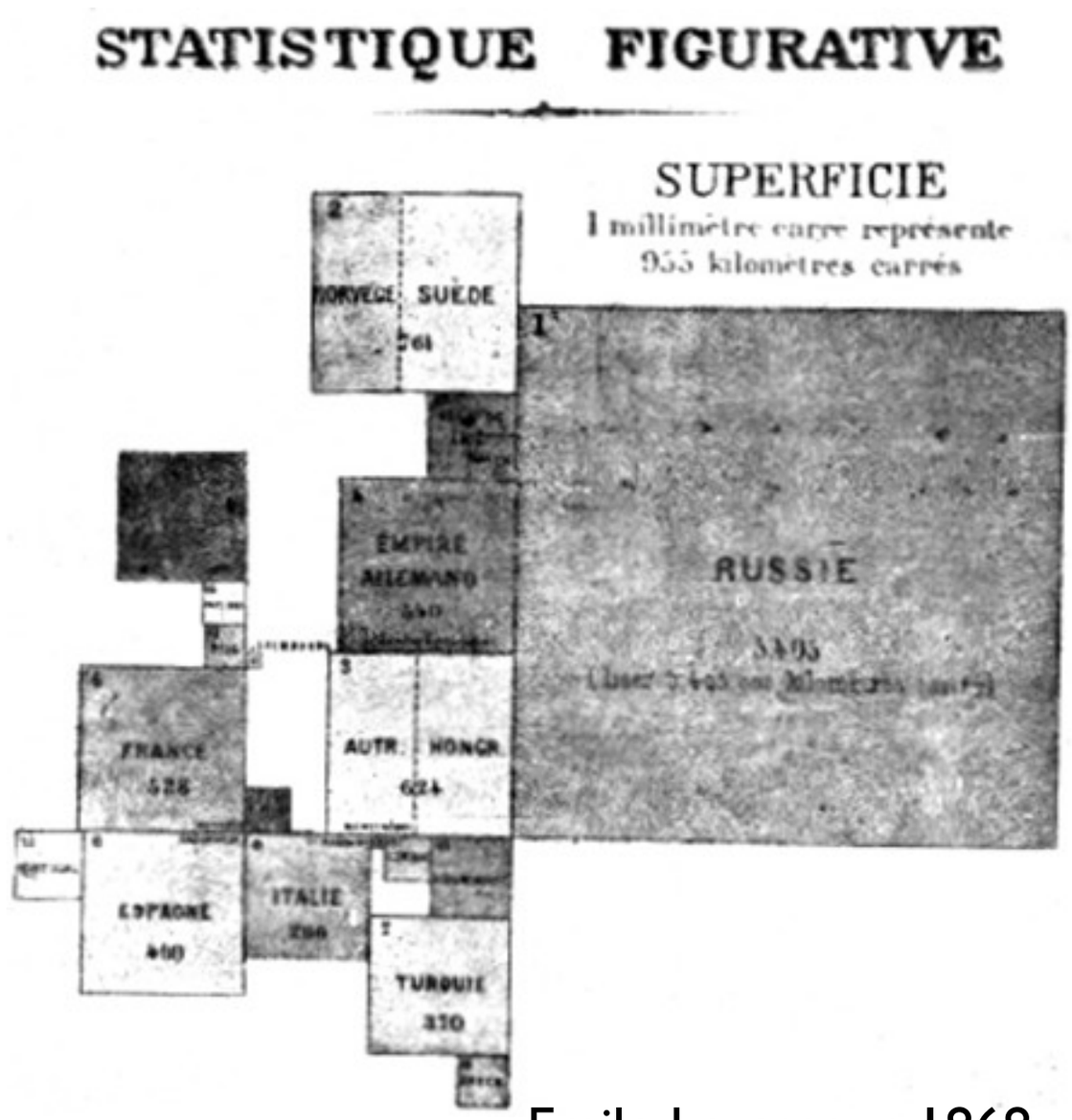


http://popvssoda.com/

cartogram

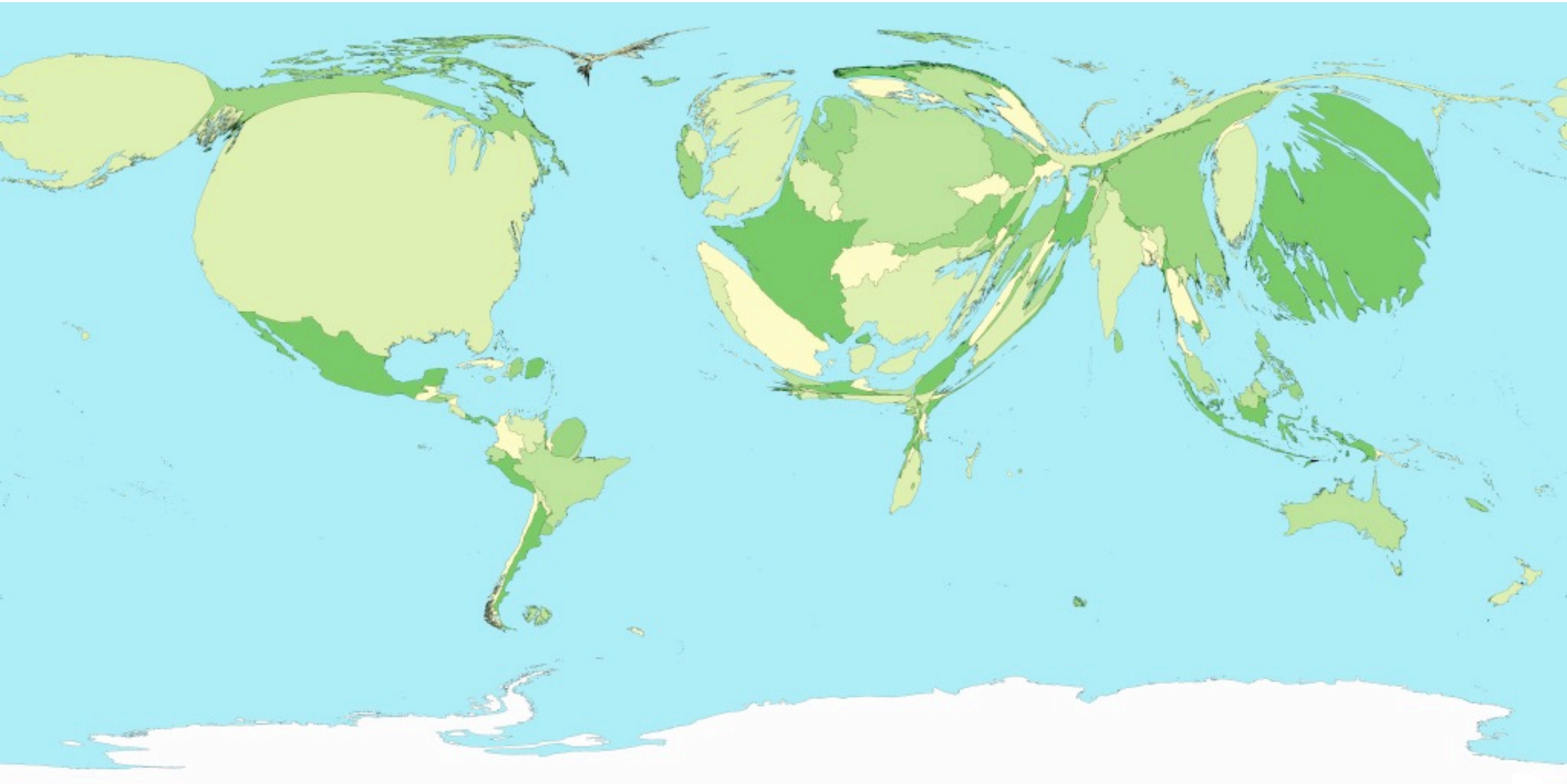
map in which areas are scaled and distorted relative to a data attribute value

Land Area
first cartogram



Emile Levasseur, 1868

GDP

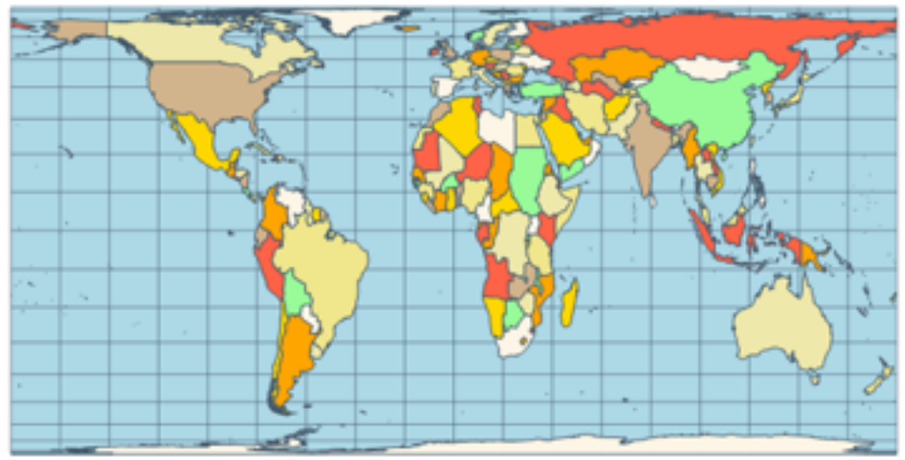


http://www-personal.umich.edu/~mejn/cartograms/

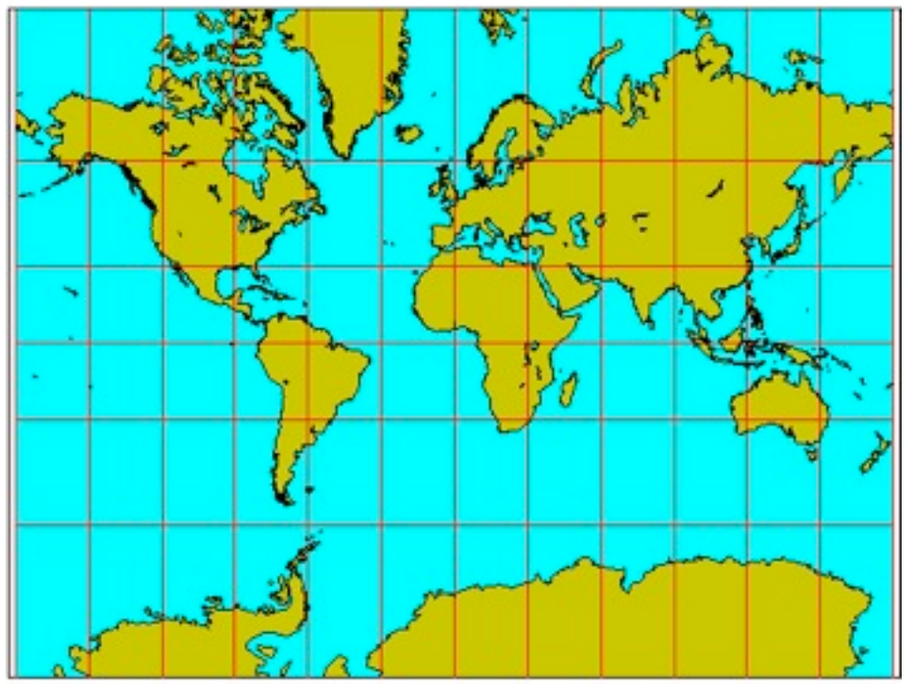
projections

azimuthal
preserves direction

equal-area
preserves area



conformal
preserves local shapes



- **toolkits and languages**
  - tableau public
  - d3
  - processing
- **tips for giving a talk**

TABLEAU PUBLIC

- **free version of Tableau**
  - publish visualizations to the web
- **create interactive visualization dashboards**
- **Tableau is a tool for visual analytics**
  - commercial predecessor of Polaris

Free Data Visualization Software | Tableau Public

http://www.tableausoftware.com/public

Apple Yahoo! Google Maps YouTube Wikipedia News (2,089) Popular Google Scholar

Login | Tableau for Companies

tableau public

SEARCH go

HOW IT WORKS
see the magic happen

GALLERY
see what others visualized

COMMUNITY
join the conversation

DOWNLOAD
Tableau Public

Data in. Brilliance out.

Visualize and share your data in minutes—for free.

PLAY

HOW IT WORKS

Learn how to visualize your data

Within minutes, our free data visualization tool can help you create an interactive viz and embed it in your website or share it. Anyone can do it, it's that easy—and it's free.

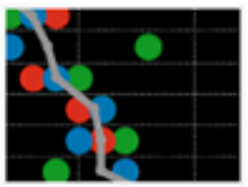
learn more

Free Training
Live from our experts
sign up now

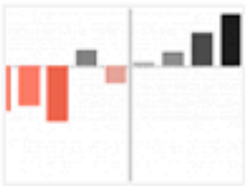
INSPIRATION ZONE

view more

Tale of 100
by Christian Chabot



Are You Ready For Some Football?
by Brett McMurphy



Recession Job Growth
by Anthony Calabrese

 Privacy Policy | Terms of Use | Contact Us | Blog

Follow us

Tableau also offers professional software for data analysis, business intelligence and data visualization.

Fell in Love with Data

Tools from the Pros #2: Joe Mako on Tableau

by ENRICO on SEPTEMBER 15, 2011
in INTERVIEWS

Ok guys, here we are with a new interview of Tools from the Pros, the series in which I interview data visualization professionals about their favorite tools. This time we have Joe Mako talking about his experience with Tableau.Before I start telling anything about Joe, let me tell you how I ended up interviewing him. I was looking for an expert to interview with proven experience in designing advanced visualizations with Tableau, so I decided to ask to some twitter friends. Result? Lots of names but only one always there: Joe Mako. If this is not enough give a look to the impressive list of video tutorialshe has in his blog.Joe is employed at S2 Statistical Solutions where he does data integration and visualization. This is what Joe wrote when I asked him to send me a short bio:

> I have used Tableau extensively since 2008, creating interactive viewpoints of data to enable people to get answers to their complex questions easily. Currently, I specialize in integrating complex databases from health insurance companies, hospital networks, and the government to enable better evidence-based decision making. I am active on the Tableau user forum, solving a variety of situations for many Tableau users ranging in skill from beginning to advanced.

I really enjoyed reading his interview. He provides lot of interesting references and links. If you are thinking about using Tableau I am sure his tips will help you a lot with your final decision.

How did you start using Tableau?

About three years ago in 2008, I had been reading FlowingData for a few months when I noticed Tableau was a sponsor and decided to check out their software to see if it could help with some projects I was working on. I felt like I was decent with formulas and VBA in Excel, but always had trouble making a

About

I am Enrico Bertini, a data visualization researcher at the Univ. of Konstanz, Germany. With FILWD I strive to bridge the gap between academics and practitioners. Plus, I love to help people becoming data visualization experts.

Follow Me

FILWD on twitter

Subscribe

RSS

By Email

Popular Posts – Start Here

Do visualizations need to be "accurate"?

7 Classic Foundational Vis Papers You Might not Want to Publicly Confess you Don't Know

How to become a data visualization ninja with 3 free tools for non-programmers

How to Become a Data Visualization Expert: A Recipe

How do you visualize too much data?

Demystifying Cargo Cult Visualization: You Cannot Visualize 3 Variables by Mixing 3

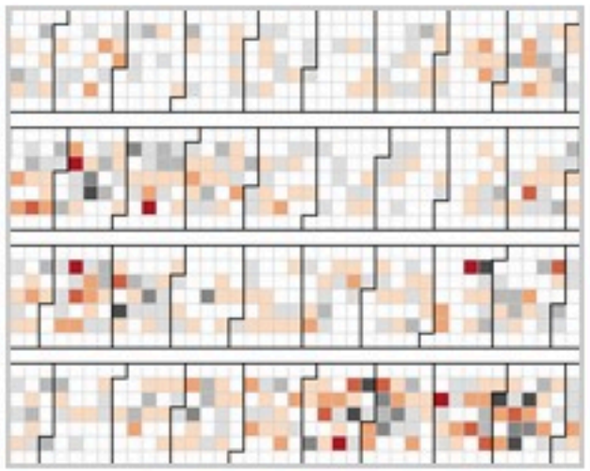
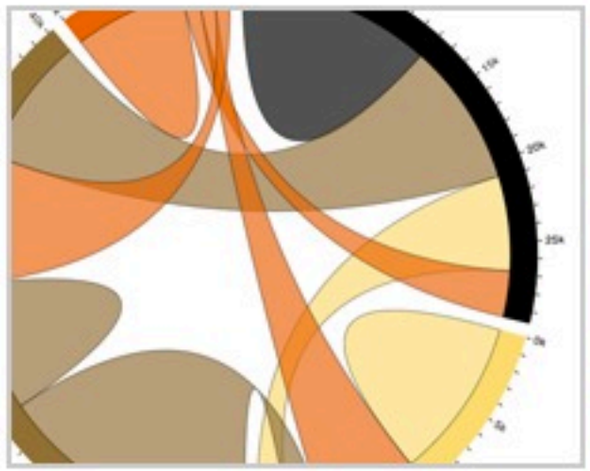
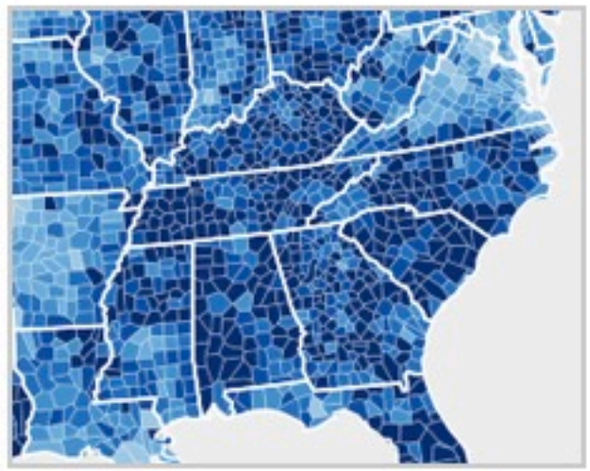
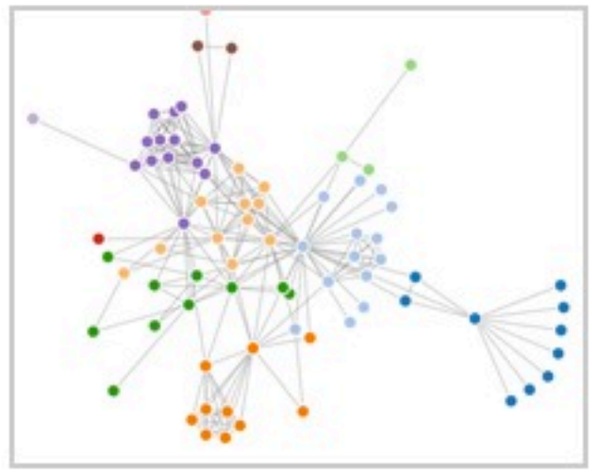
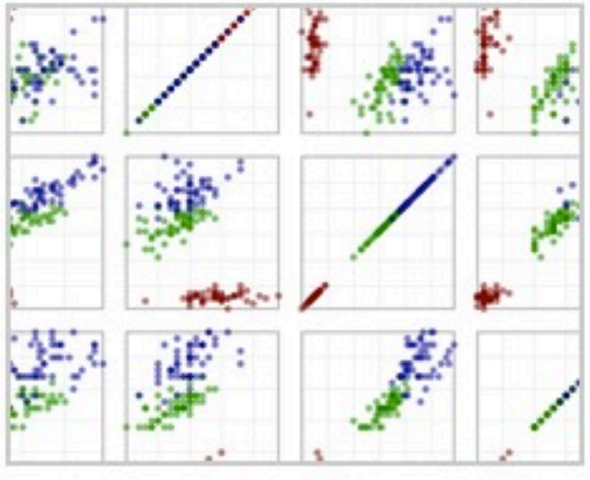
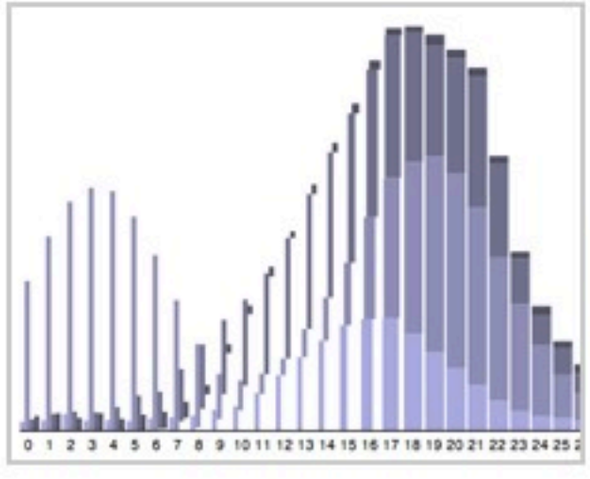
D3

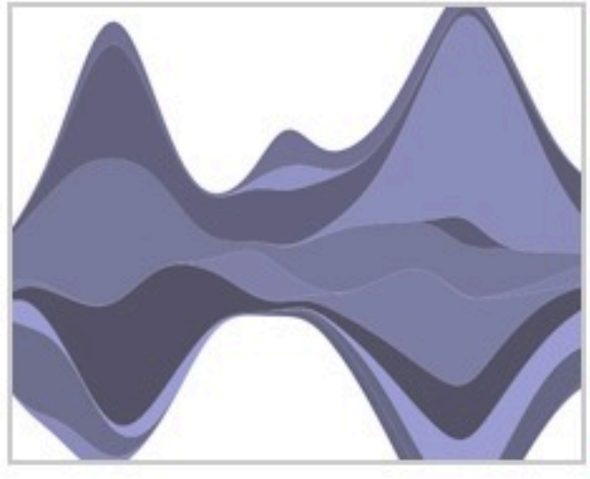
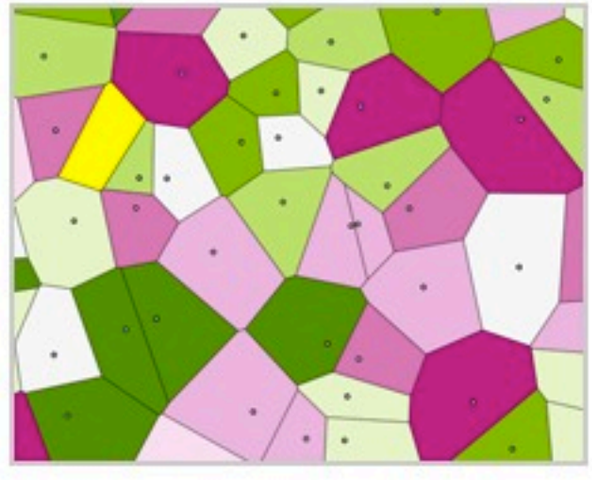
- **domain-specific language for developing visualizations for the web**
- **uses JavaScript**
  - requires understanding
    - *JavaScript objects, functions, and the method-chaining paradigm of jQuery*
    - *SVG*
- **replacement to Protovis**
- **lots of built in methods and techniques**

d3.js

Data-Driven Documents

D3.js is a small, free JavaScript library for manipulating documents based on data.

github.com/mbostock

@mbostock

Square

D3 for Mere Mortals

By Luke Francl (look@recursion.org), August 2011

d3.js is a data visualization library by Mike Bostock, who is also the primary creator of Protovis, which D3 is designed to replace.

D3 has a steep learning curve, especially if (like me) you are not used to the pixel-precision of graphics programming. To build a visualization with D3, you need to understand JavaScript objects, functions, and the method-chaining paradigm of jQuery; the basics of SVG and CSS; D3's API; and the principles for designing effective infographics.

The pay off is that you can create some amazing visualizations with D3 (just look at the examples!).

I know very little about D3, but the best way to learn something is to teach it...so here is a very simple introduction to D3 from the beginning.

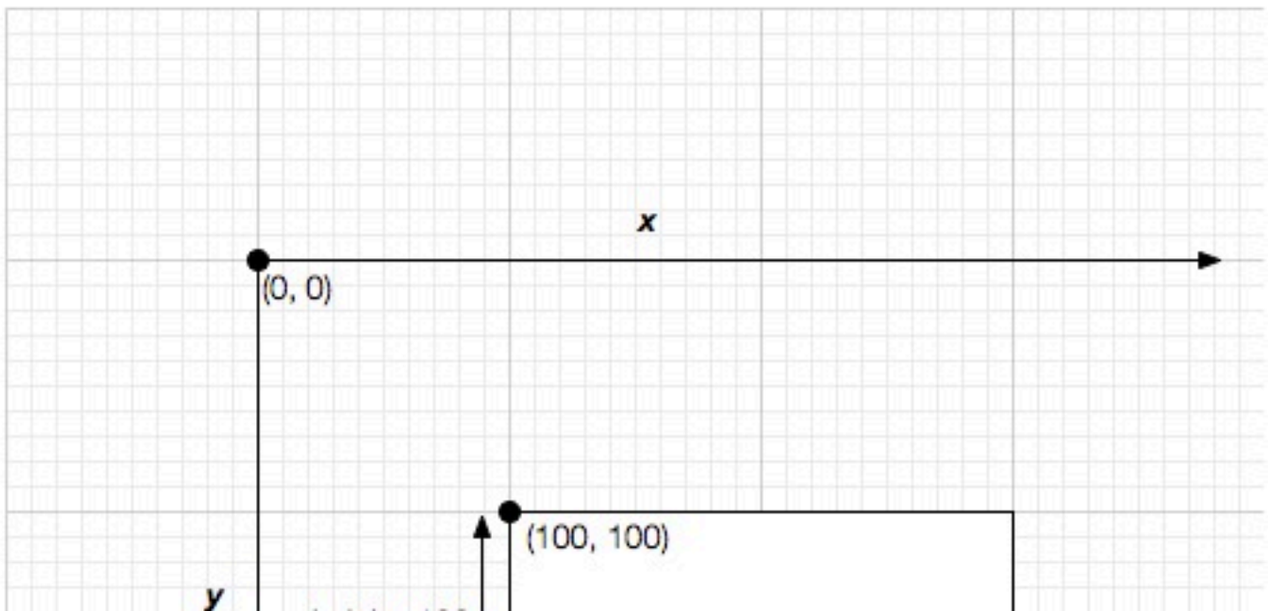
SVG

D3 shares similarities with its predecessor Protovis. However, instead of having its own graphical representation, D3 uses SVG (or HTML for simpler visualizations). This means that using D3 requires a fair amount of understanding of SVG. Fortunately, D3 provides a jQuery-like interface to the DOM, which means you will not have to endure the XML situps.

SVG provides basic shape primitives like `line`, `rect`, and `circle` as well as `text` and `path` to build complicated lines and shapes. If you think about a bar chart, you can see how you could make one of lines and rectangles with text for labels. D3 provides an API to help you place your rectangles in the correct location on the canvas.

To place a rectangle on the canvas, you need to understand that the axis starts in the top left corner and counts up towards the bottom of the screen. An SVG `rect` is positioned from its top-left corner and has a width and height.

Here's a diagram of a rectangle positioned at (100, 100) with a height of 100 pixels and a width of 200 pixels.



Fell in Love with Data

Tools from the Pros #3: Jan Willem Tulp on D3 and Protovis

by ENRICO on OCTOBER 13, 2011
in GUIDES, INTERVIEWS

When I saw for the first time a visualization developed by Jan, the Ghost Counties, I was totally fascinated. It's brilliant. It took me a while to understand how it works, but once I got it I could not help but admiring the strange mix of complexity and simplicity it provides.

Despite he looks so serious in this picture on the left, he has a big smile and he is fun. I met him for the first time at Visualizing Europe and since then we exchanged many emails. Plus, he is a regular commenter here (and everywhere) and I love him for that.

I don't know how much I have to add to convince you his advice is a valuable one. Just give a look to his portfolio and judge yourself. He is IMO one of the most interesting data visualization freelancers recently appeared on the scene.

I know, by talking with him, he is proficient with several technologies but he has a passion for D3.

How did you start using Protovis/D3?

I've always been someone interested in the latest technologies. So, since I follow the data viz community very closely, I was aware of Protovis very early on, and I was aware of the development of D3 even before it was released to the public. I have a software development background, so I don't have too much trouble finding my way in new programming languages, and since it excites me to work with new technologies and frameworks, I just started playing with Protovis and D3 as soon as it became available.

What's the best and worst aspect of Protovis/D3?

The best aspect of Protovis is that it is a domain specific declarative language, which means that is fairly easy to start writing code, using visualization related keywords and functions. The best aspects of D3 is it's flexibility (more direct integration with SVG) and better performance. The worst aspect of both D3 and Protovis is that it's hard or impossible to get it working on older browsers, and the learning curve for D3 may be somewhat harder than for Protovis.

About

I am Enrico Bertini, a data visualization researcher at the Univ. of Konstanz, Germany. With FILWD I strive to bridge the gap between academics and practitioners. Plus, I love to help people becoming data visualization experts.

Follow Me

FILWD on twitter

Subscribe

RSS
By Email

Popular Posts – Start Here

Do visualizations need to be "accurate"?

7 Classic Foundational Vis Papers You Might not Want to Publicly Confess you Don't Know

How to become a data visualization ninja with 3 free tools for non-programmers

How to Become a Data Visualization Expert: A Recipe

How do you visualize too much data?

Demystifying Cargo Cult Visualization: You Cannot Visualize 3 Variables by Mixing 3 Colors

Can visualization influence people? I mean can we prove it?

Why Visualization Cannot Afford Ignoring

INTRO TO PROCESSING

slide acknowledgements:
Moritz Baecher, Harvard University

Outline

What is Processing?

Where to **get** it?

How to **use** it?

What can I **do** with it?

Where to get **help**?

Outline

What is Processing?

Where to **get** it?

How to **use** it?

What can I **do** with it?

Where to get **help**?

- **domain-specific language for interactive visualizations**
- **export applets and applications**
- **built on top of Java**
  - requires understanding
    - *basic OO-methods*
    - *basic Java*
    - *simplified graphics pipeline*
- **simplification of graphics programming (ie OpenGL)**
  - no built in methods or techniques

Outline

What is Processing?

Where to **get** it?

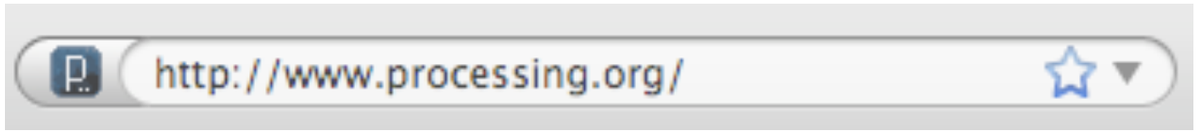
How to **use** it?

What can I **do** with it?

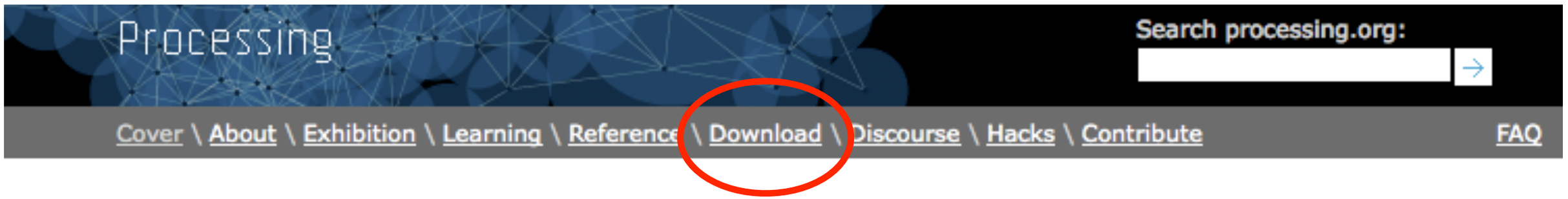
Where to get **help**?

Where to get it?

Go to:



Click on “Download”:



Pick your system:

↓ Linux
↓ Mac OSX
↓ Windows
↓ Windows (Without Java)*

Outline

What is Processing?

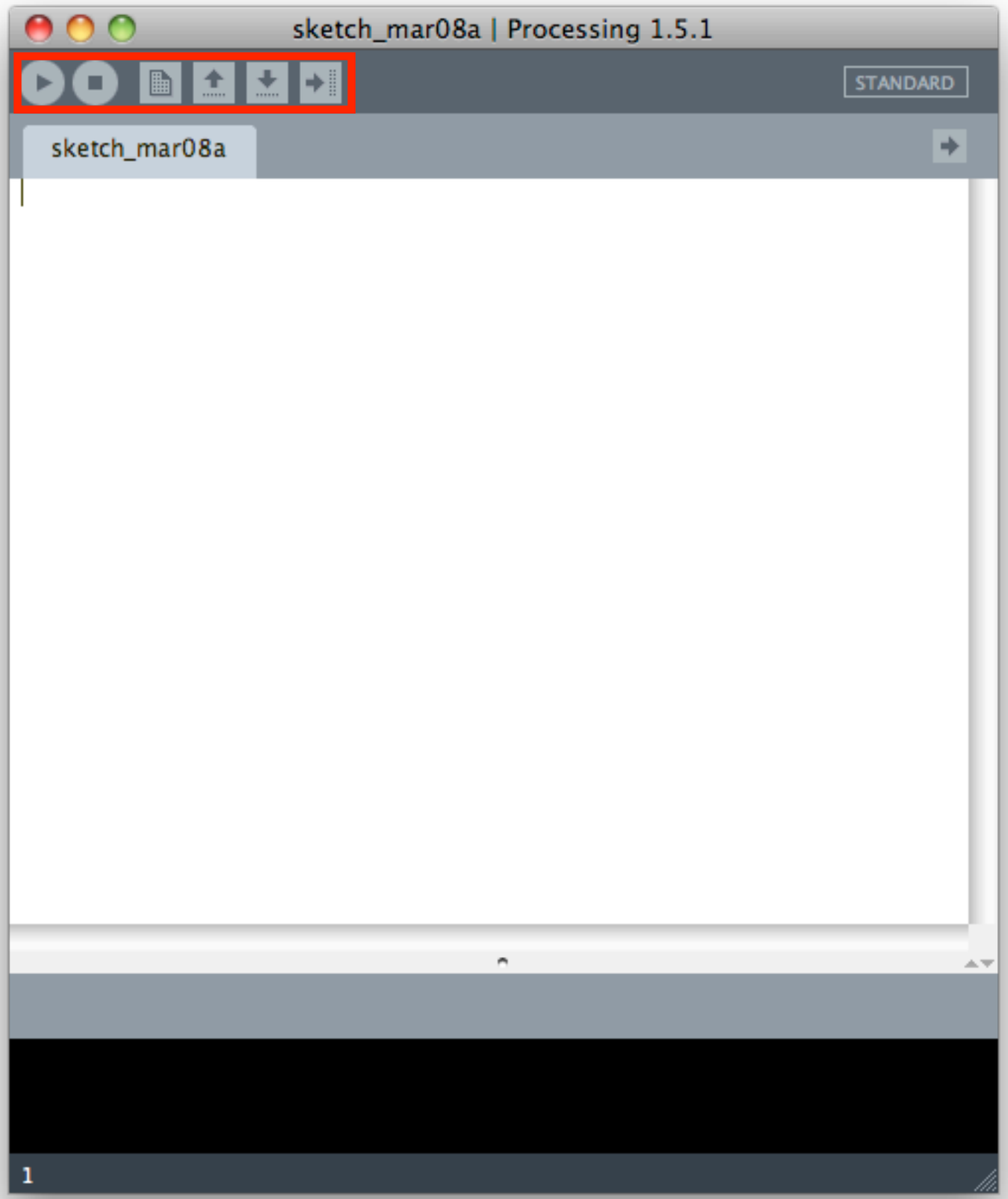
Where to **get** it?

How to **use** it?

What can I **do** with it?

Where to get **help**?

Processing Development Environment



Run Stop

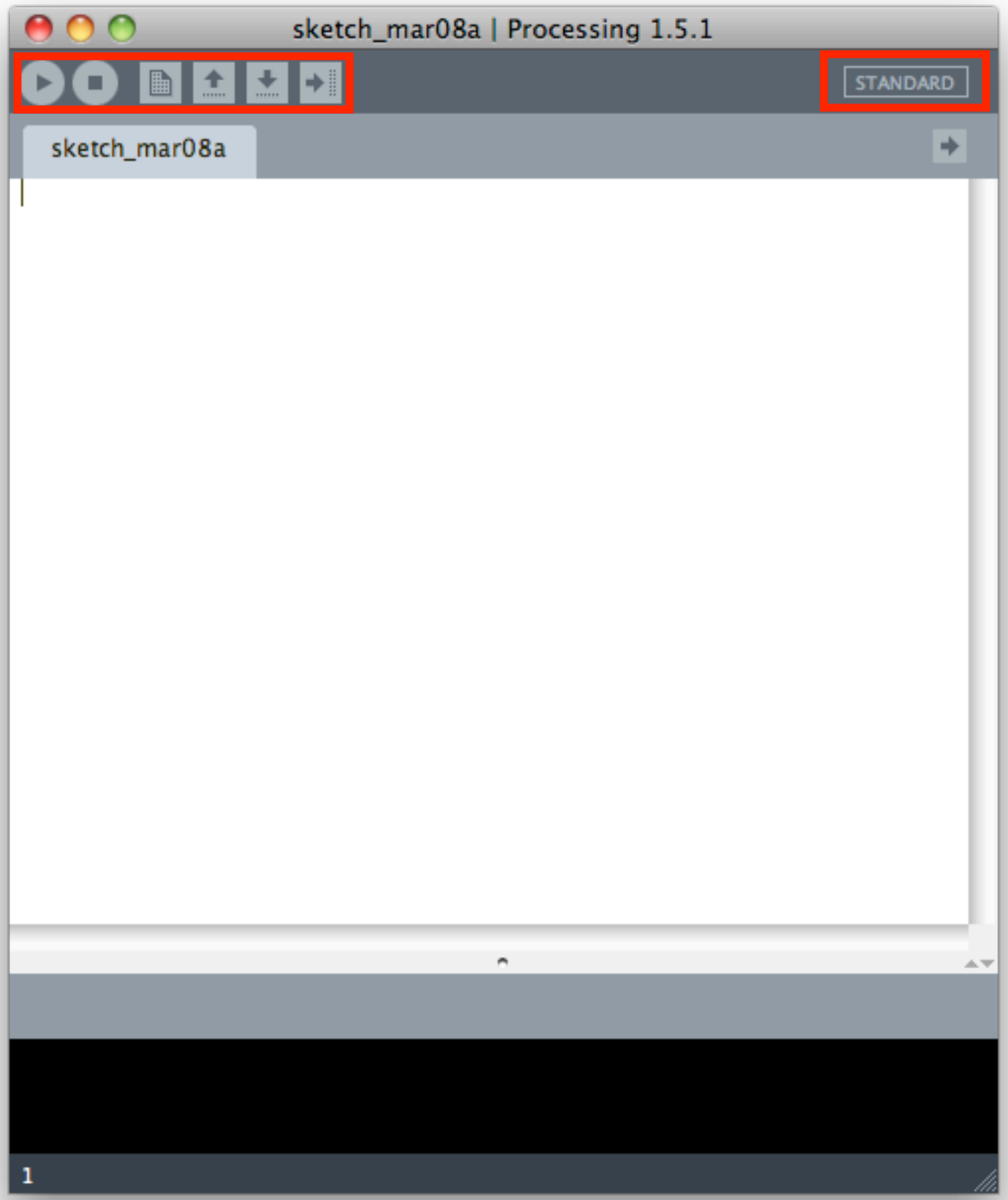
Open

New

Save

Export

Processing Development Environment



Run Stop

Open

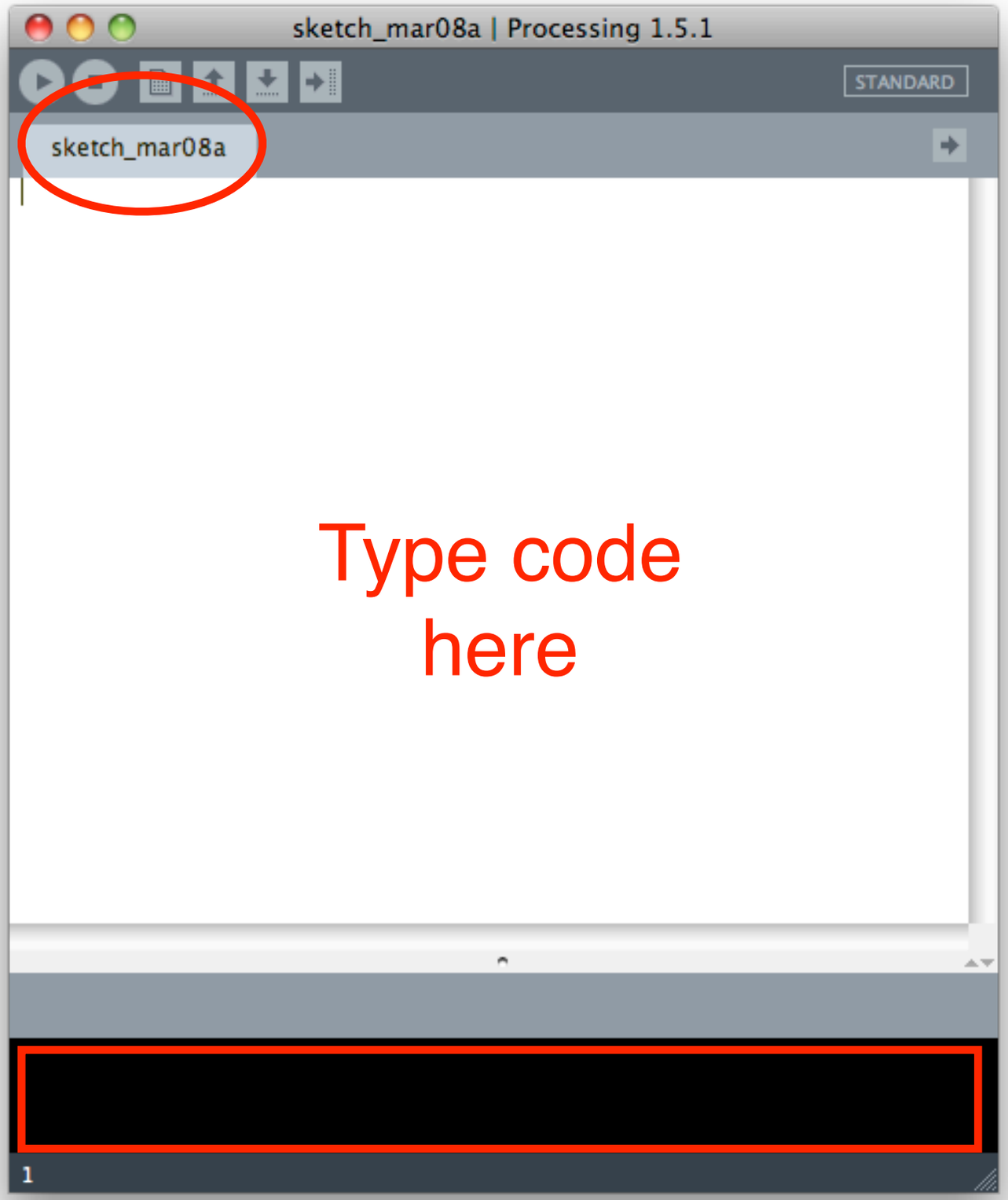
New

Save

Export

Andriod

Processing Development Environment



Sketch name

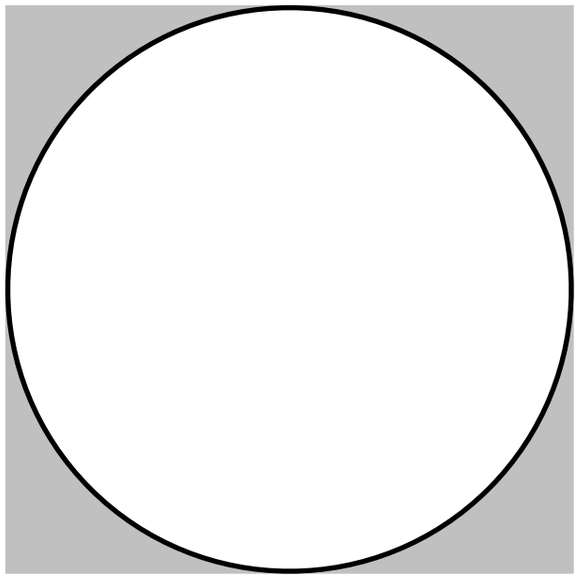
Message window

Commands

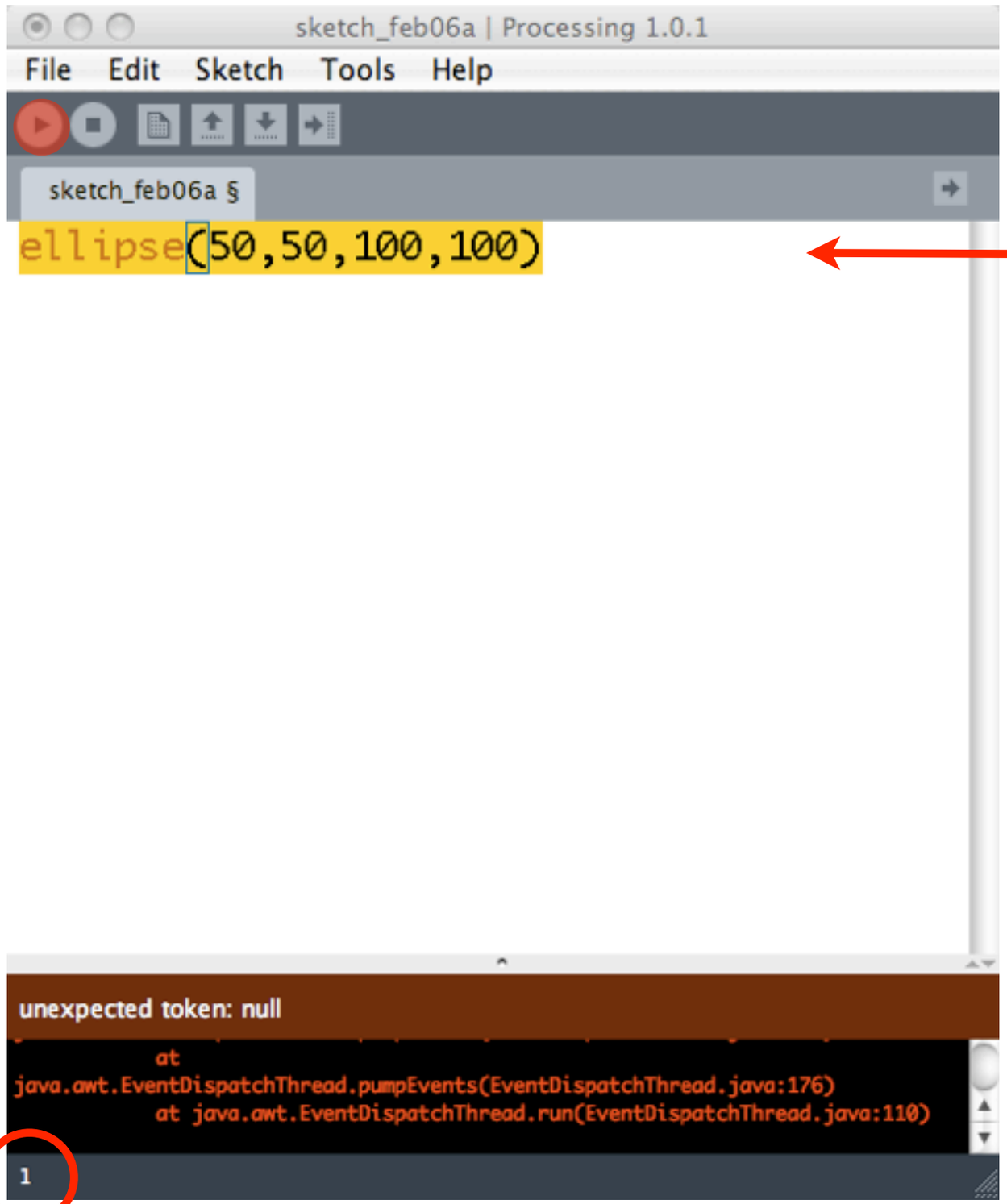
```
name(arguments);
```

```
ellipse(50,50,100,100);
```

A First Sketch



Errors

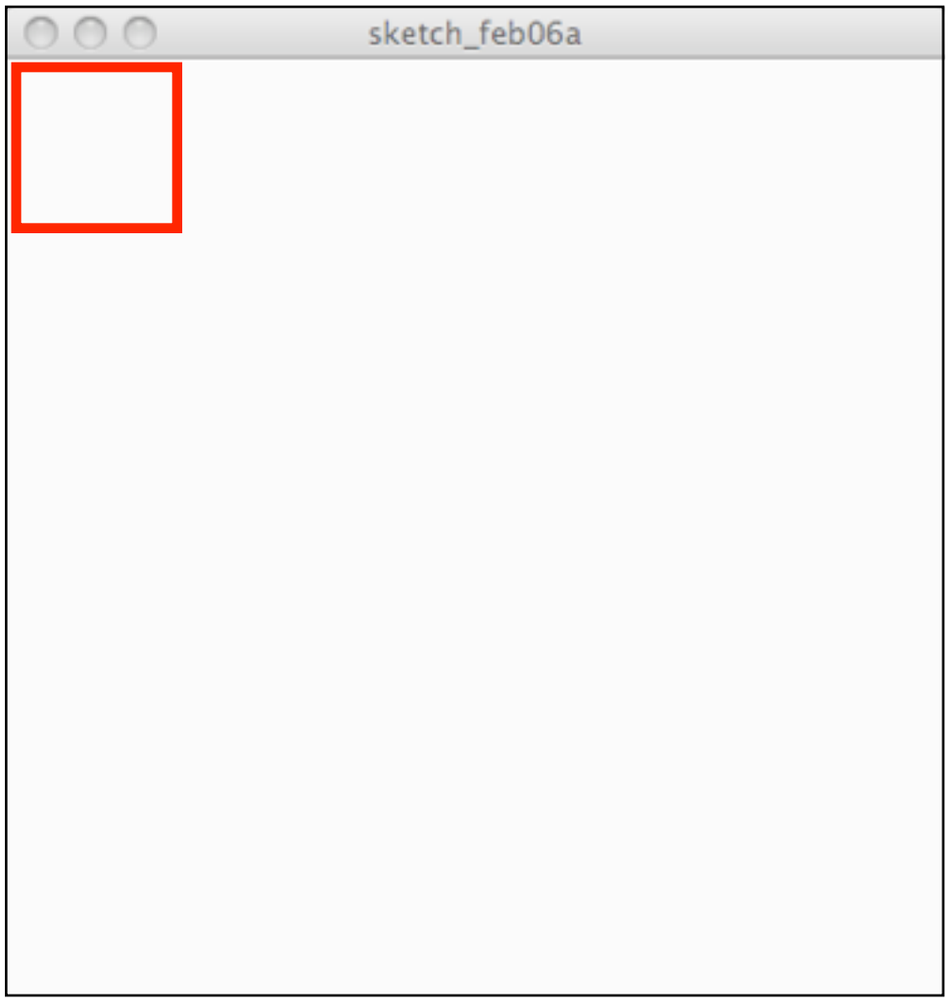


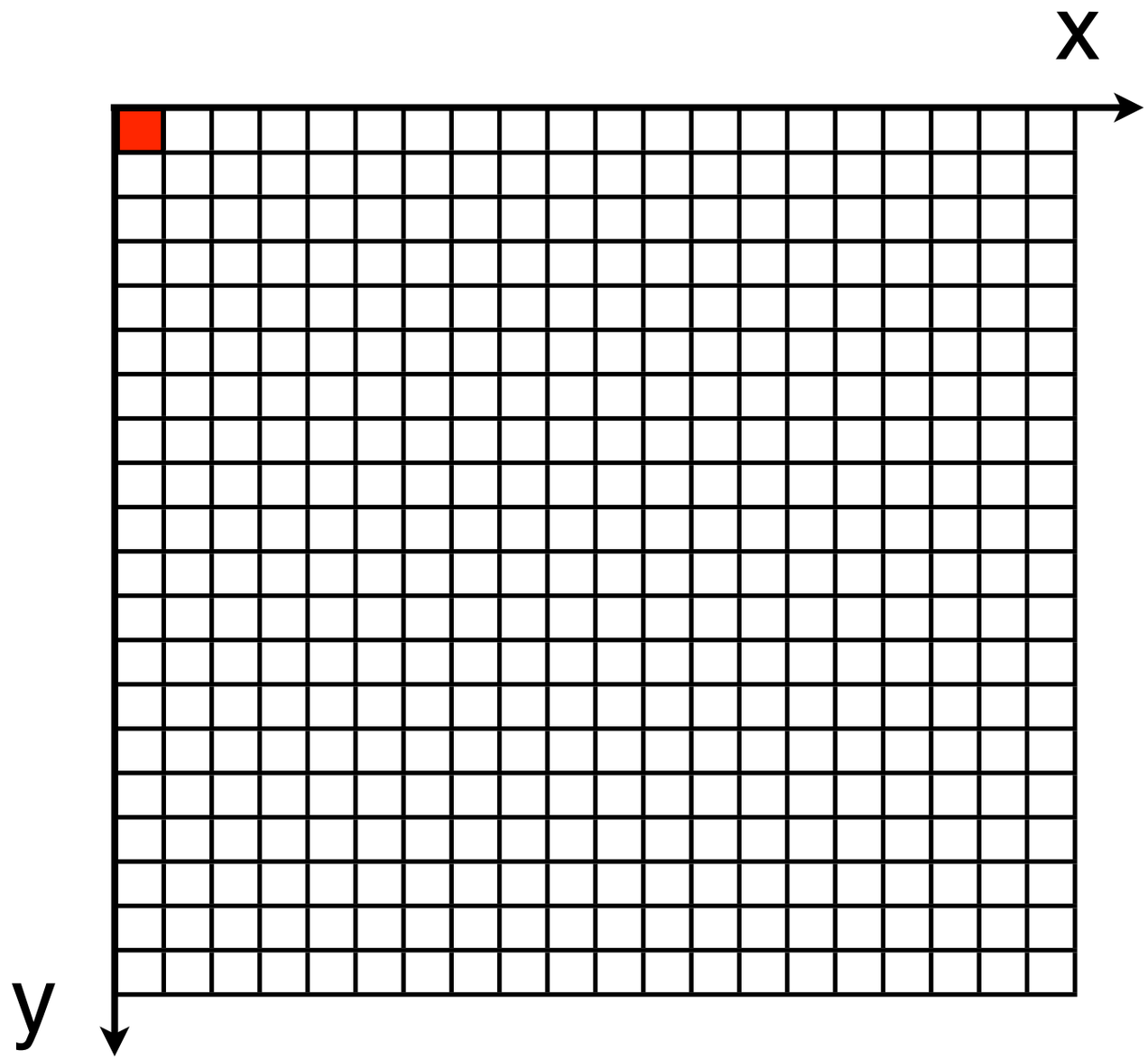
highlighted line

error message

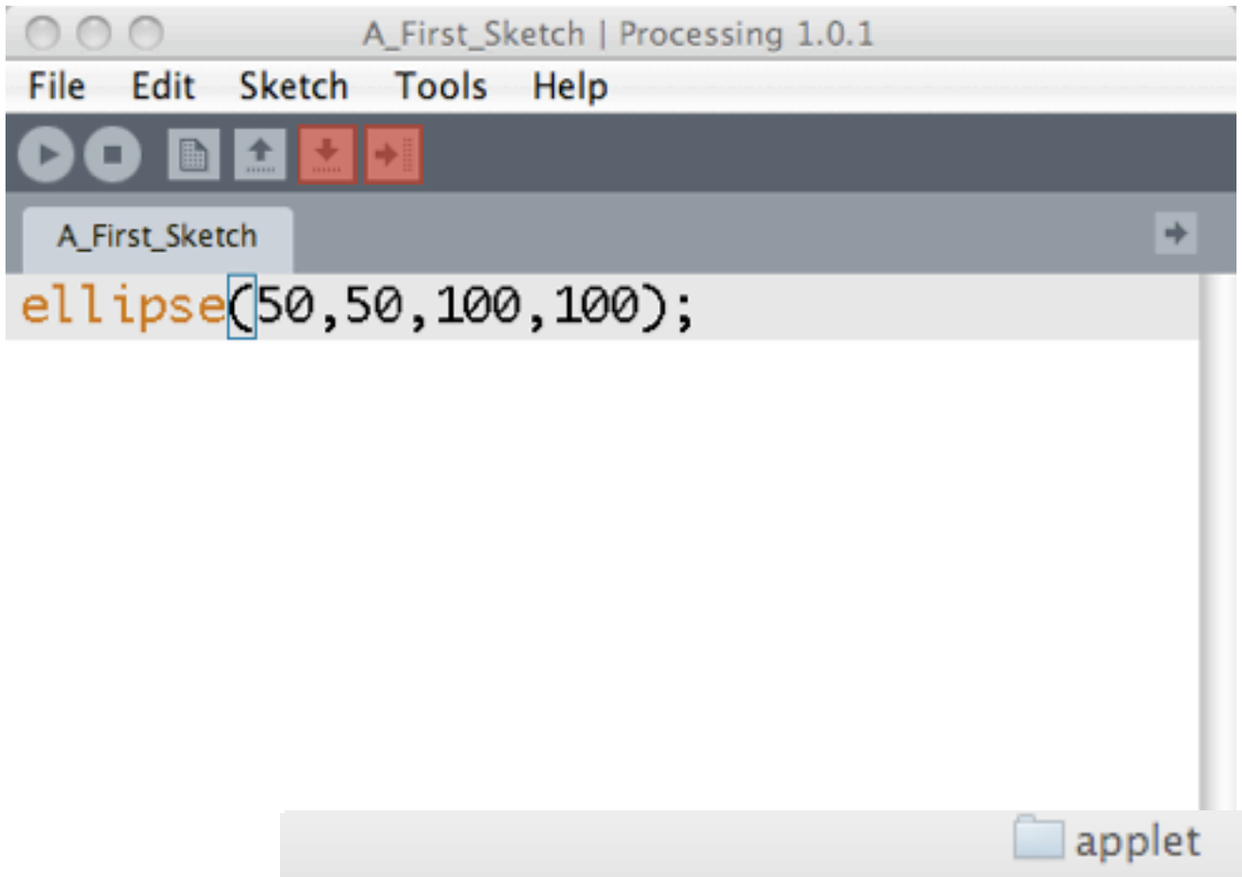
line number

Output Window



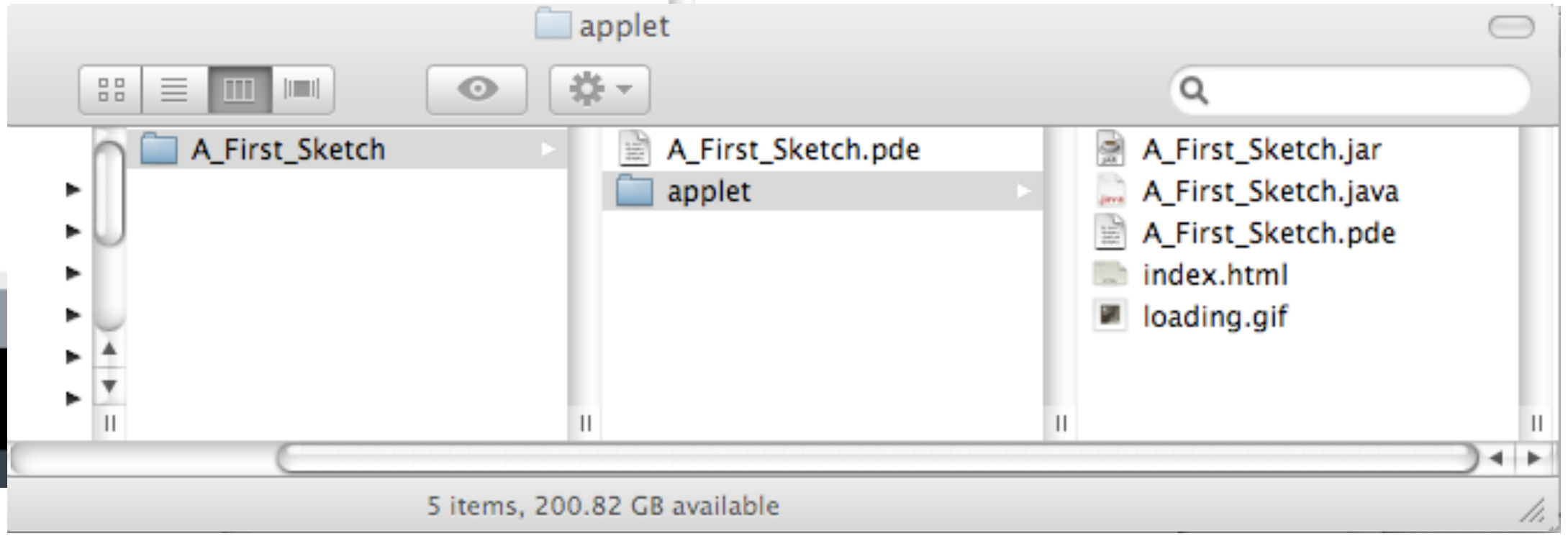


Save And Export



Save

Export



Outline

What is Processing?

Where to **get** it?

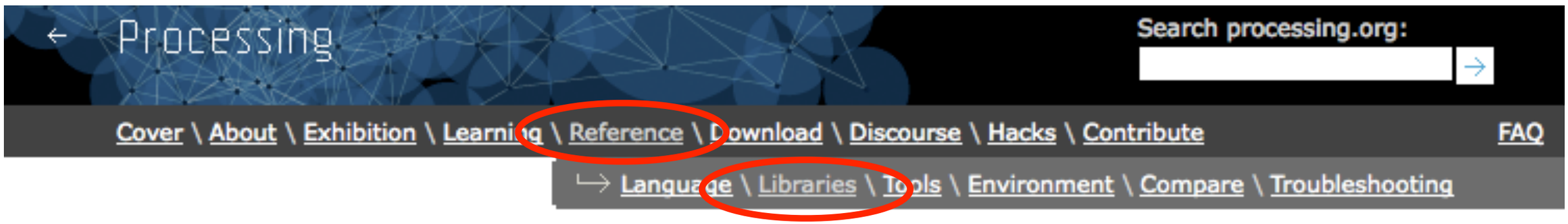
How to **use** it?

What can I **do** with it?

Where to get **help**?

Language and Libraries

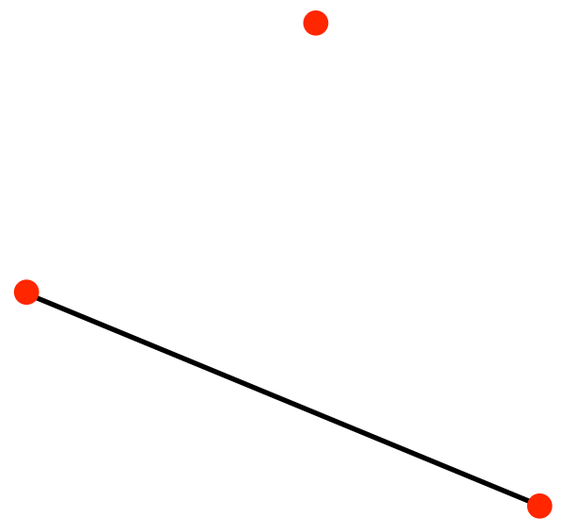
Shape, Color, Image, Text, Interaction, ...



Video, Network, PDF, Audio, ...

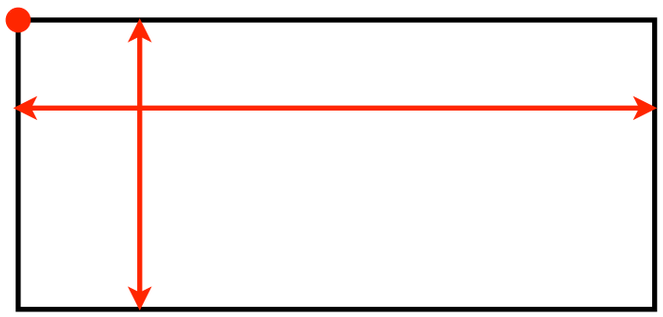
Simple Shapes

```
point(x,y);
```

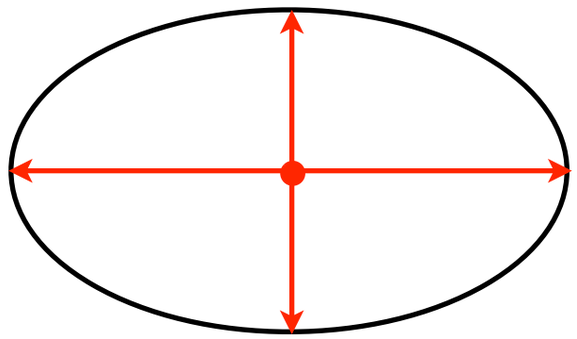


```
line(x1,y1,x2,y2);
```

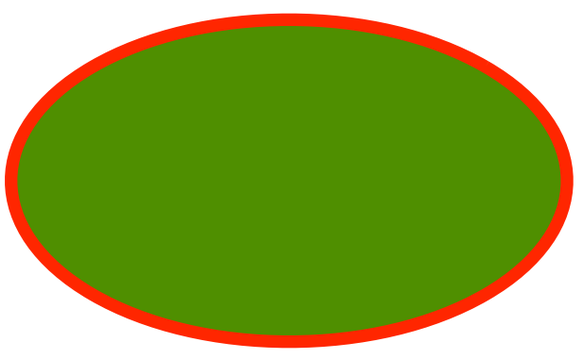
```
rect(x,y,width,height);
```



```
ellipse(x,y,width,height);
```



Colors



fill color

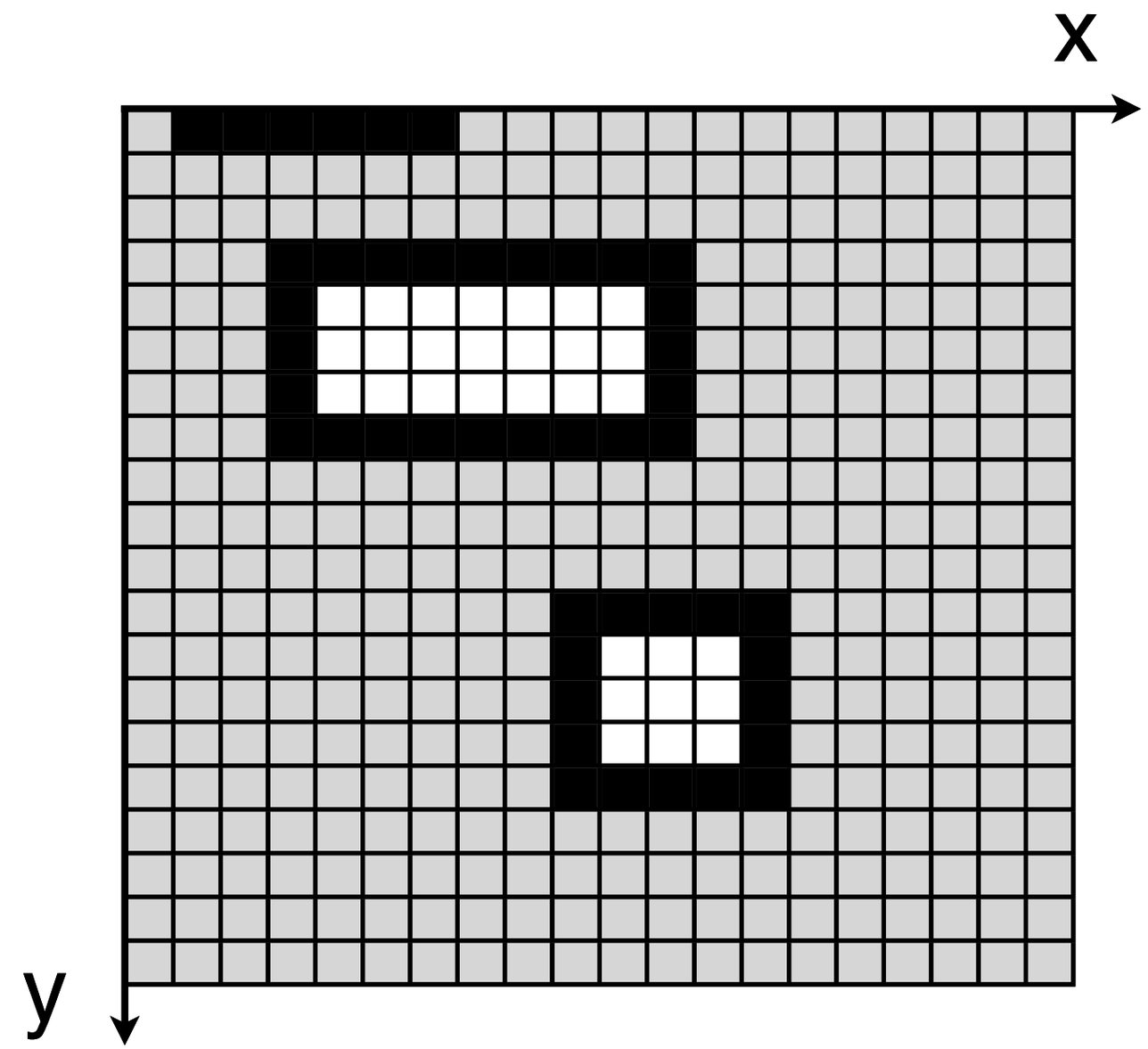
stroke color

```
stroke(red,green,blue);

stroke(grey);

noStroke();


fill(red,green,blue);

fill(grey);

noFill();
```

red,green,blue,grey in [0,255]

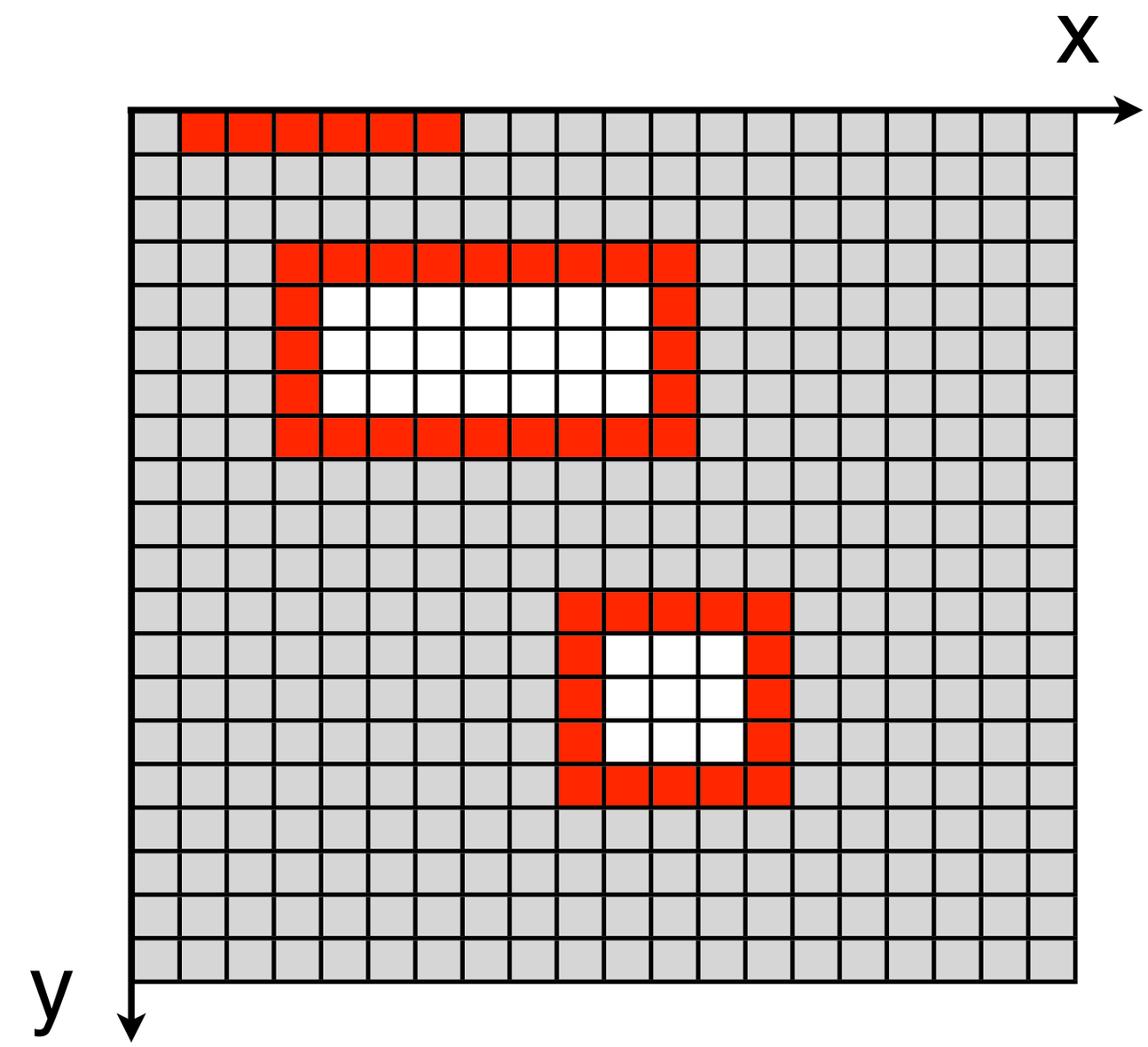
Example

```
line(1,0,6,0);

rect(3,3,9,5);

rect(9,11,5,5);
```



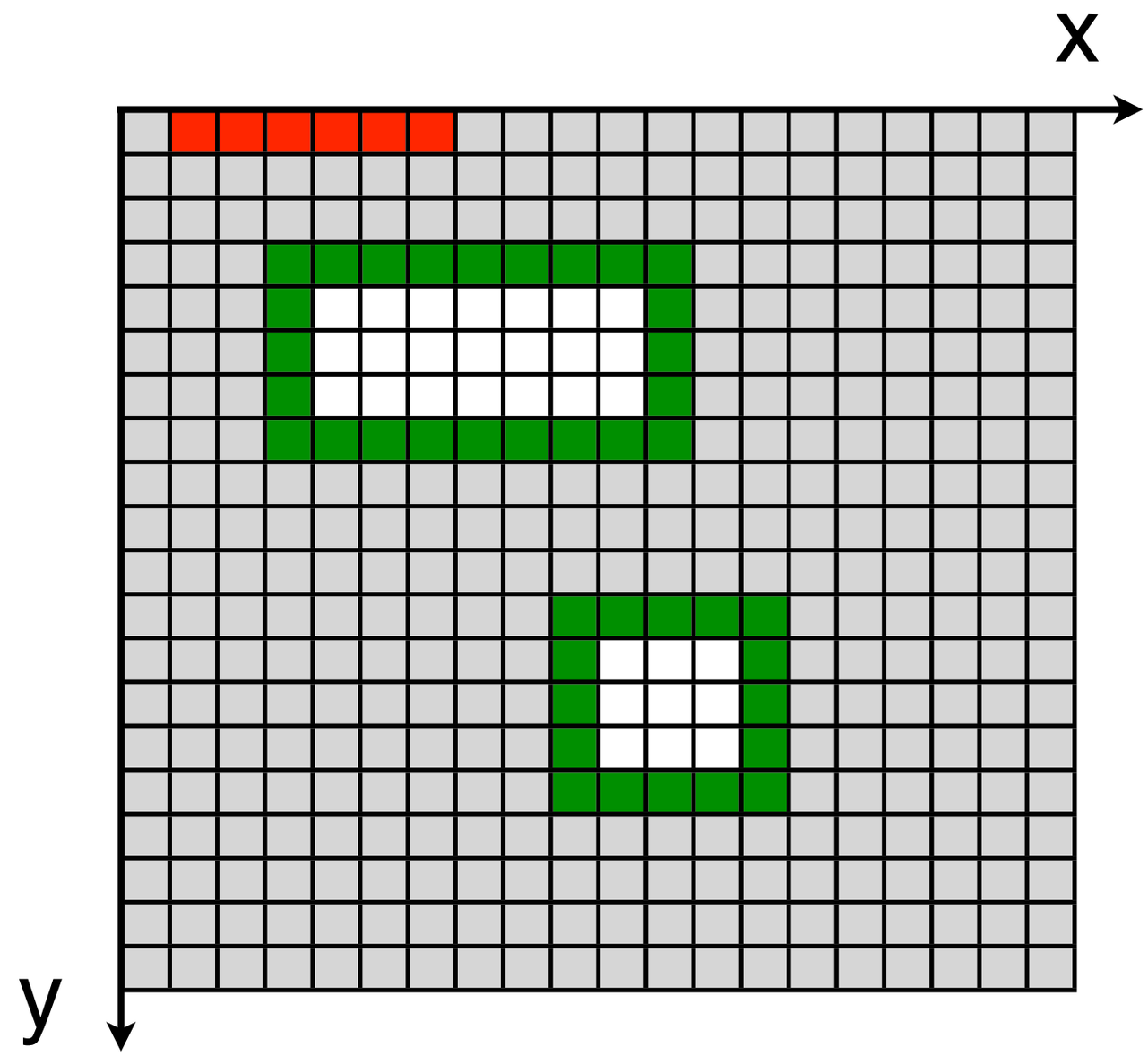
Example

```
stroke(255,0,0);

line(1,0,6,0);

rect(3,3,9,5);

rect(9,11,5,5);
```



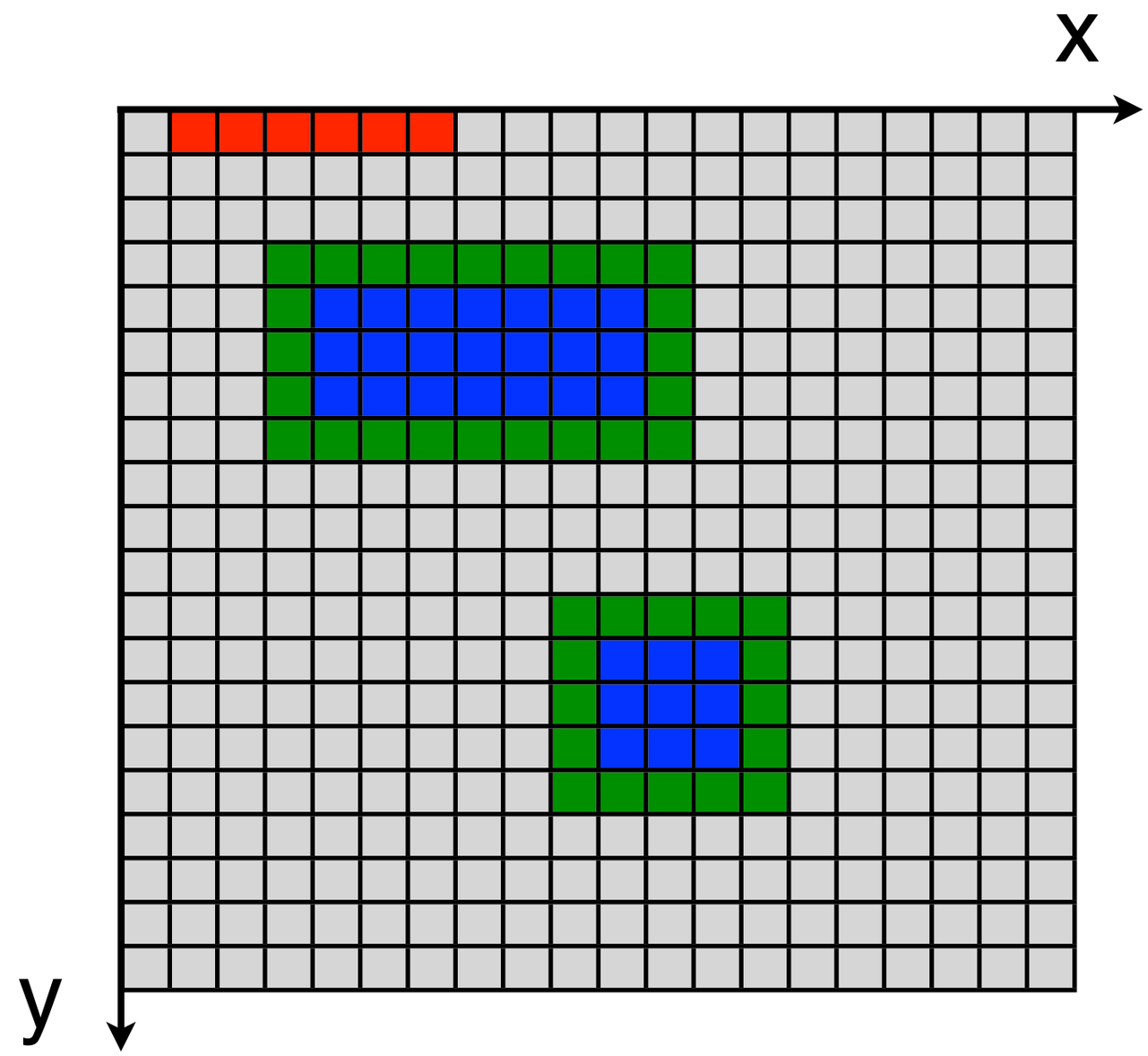
Example

```
stroke(255,0,0);

line(1,0,6,0);

stroke(0,255,0);

rect(3,3,9,5);

rect(9,11,5,5);
```



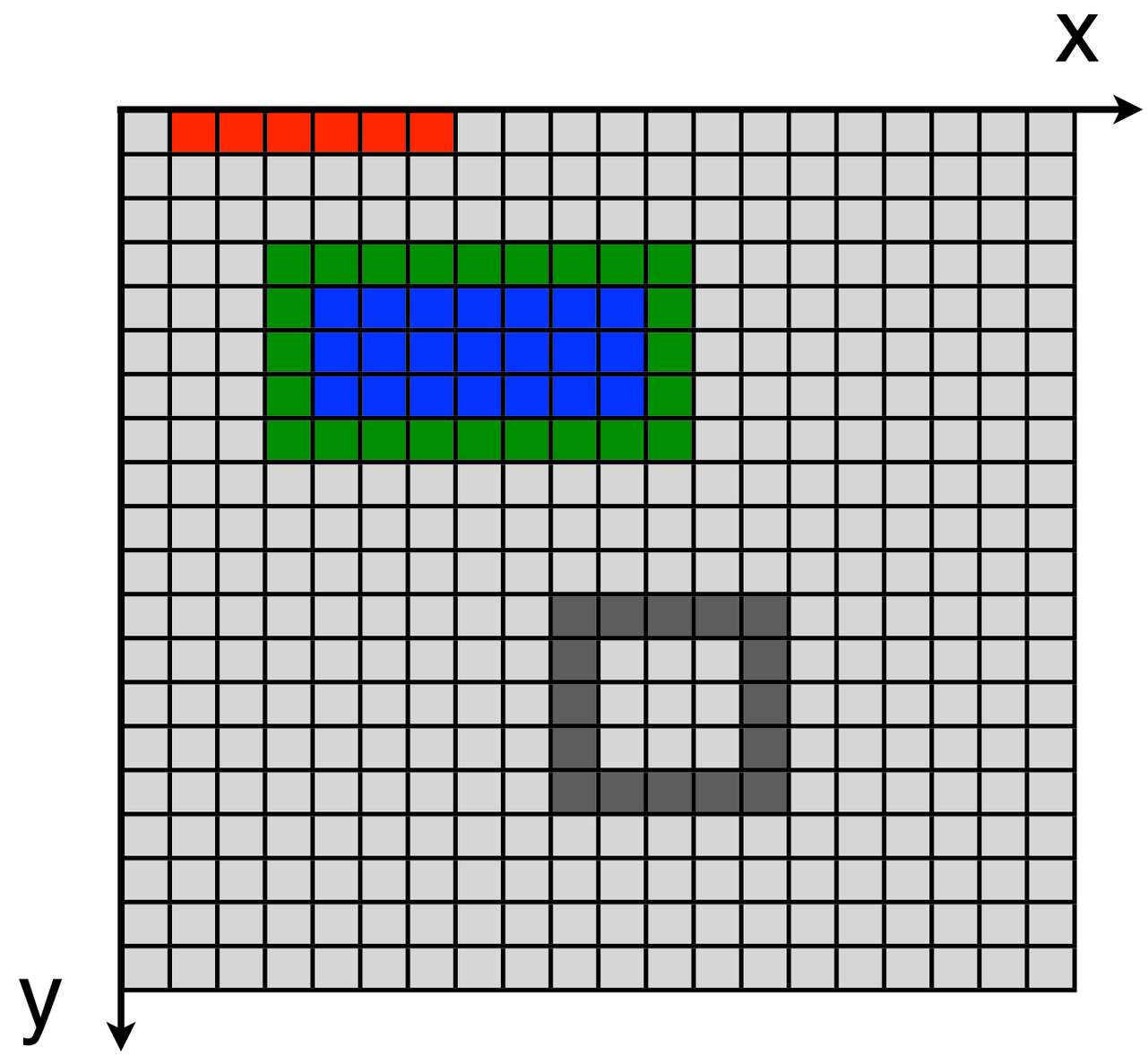
Example

```
stroke(255,0,0);

line(1,0,6,0);

stroke(0,255,0);

fill(0,0,255);

rect(3,3,9,5);



rect(9,11,5,5);
```



Example

```
stroke(255,0,0);

line(1,0,6,0);

stroke(0,255,0);

fill(0,0,255);

rect(3,3,9,5);

noFill();

stroke(20);

rect(9,11,5,5);
```



Animation

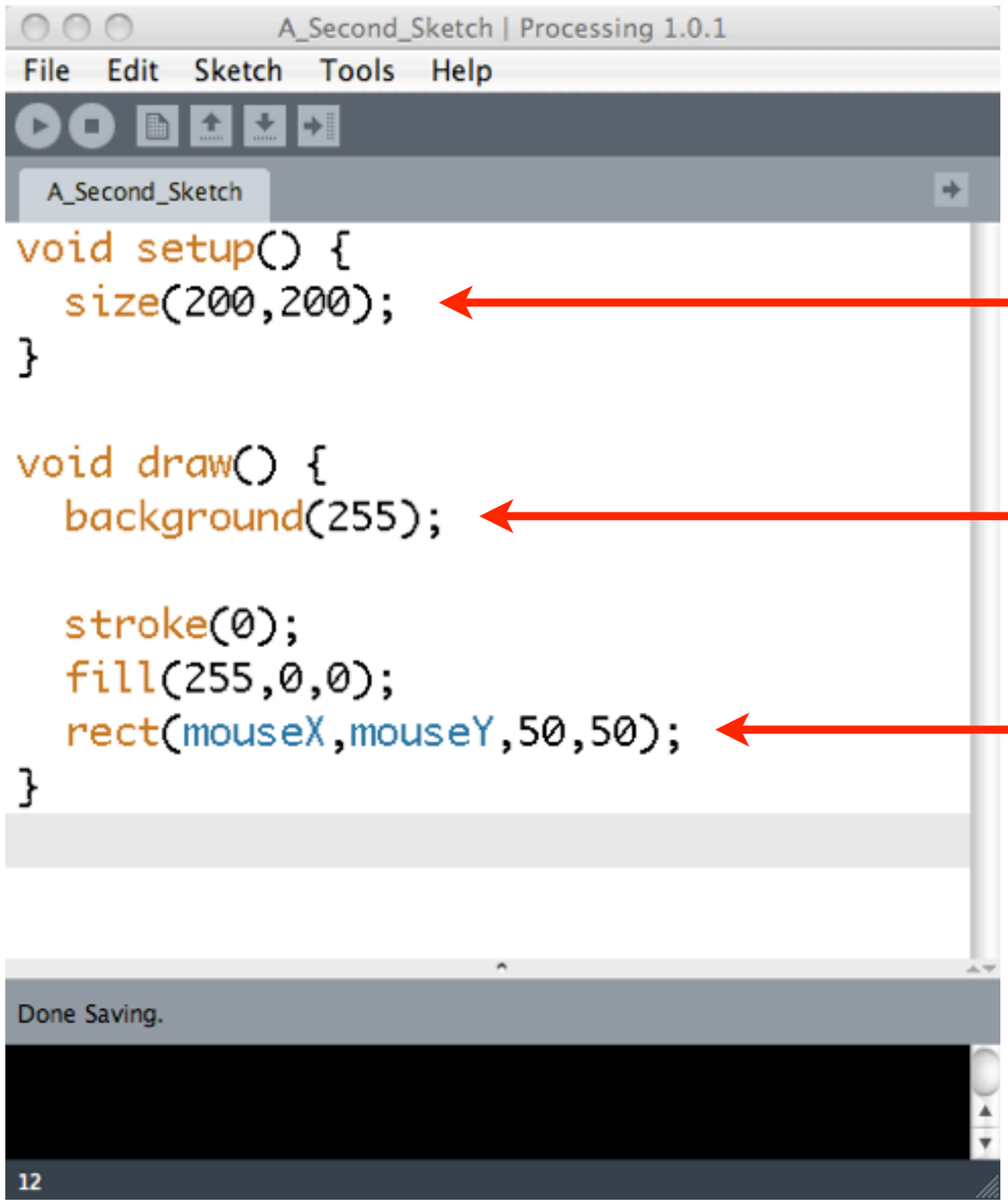
```
void setup() {

  // init code

}
```

skip code

```
void draw() {

  // drawing code

}
```

```
setup();

draw();

draw();

draw();

draw();

draw();

draw();

...
```

Example



set **window** size

set **background** color

(mouseX, mouseY)

mouse position

Interaction

```
mouseX, mouseY
```

current mouse position

```
void mousePressed() {
  // handle event
}
```

called when **mouse** is **pressed**

```
void keyPressed() {
  // handle event
}
```

called when a **key** is **pressed**

Example

draw red **rectangle** when **mouse** is **pressed**

clear window when a **key** is **pressed**

Displaying Text

- `text()` - draw text to the screen
- `createFont()` - load a system font (slow!)
- `loadFont()` - load a font from a file (slow!)
- `textSize()` - set font size, in points

Outline

What is Processing?

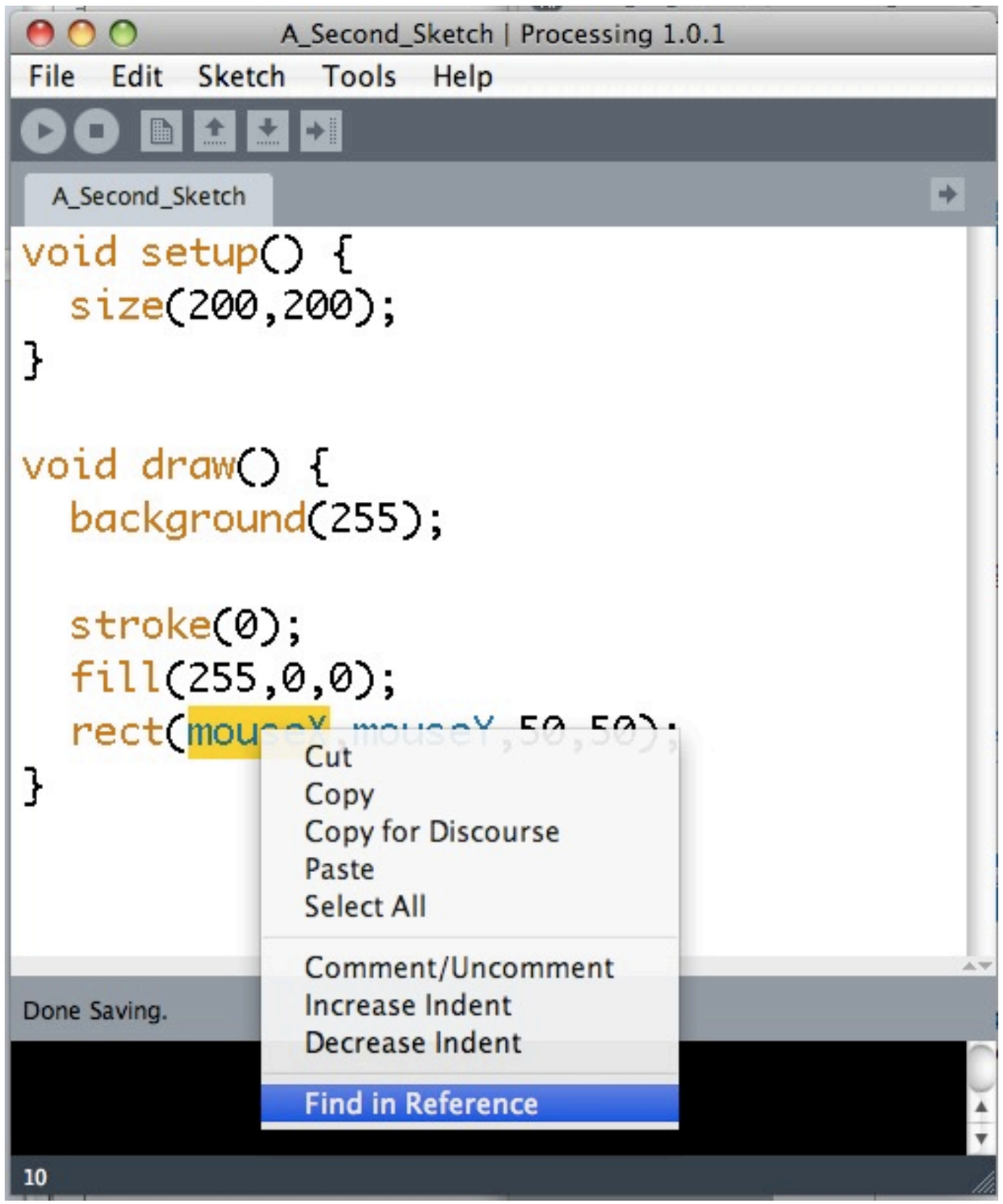
Where to **get** it?

How to **use** it?

What can I **do** with it?

Where to get **help**?

Find in Reference

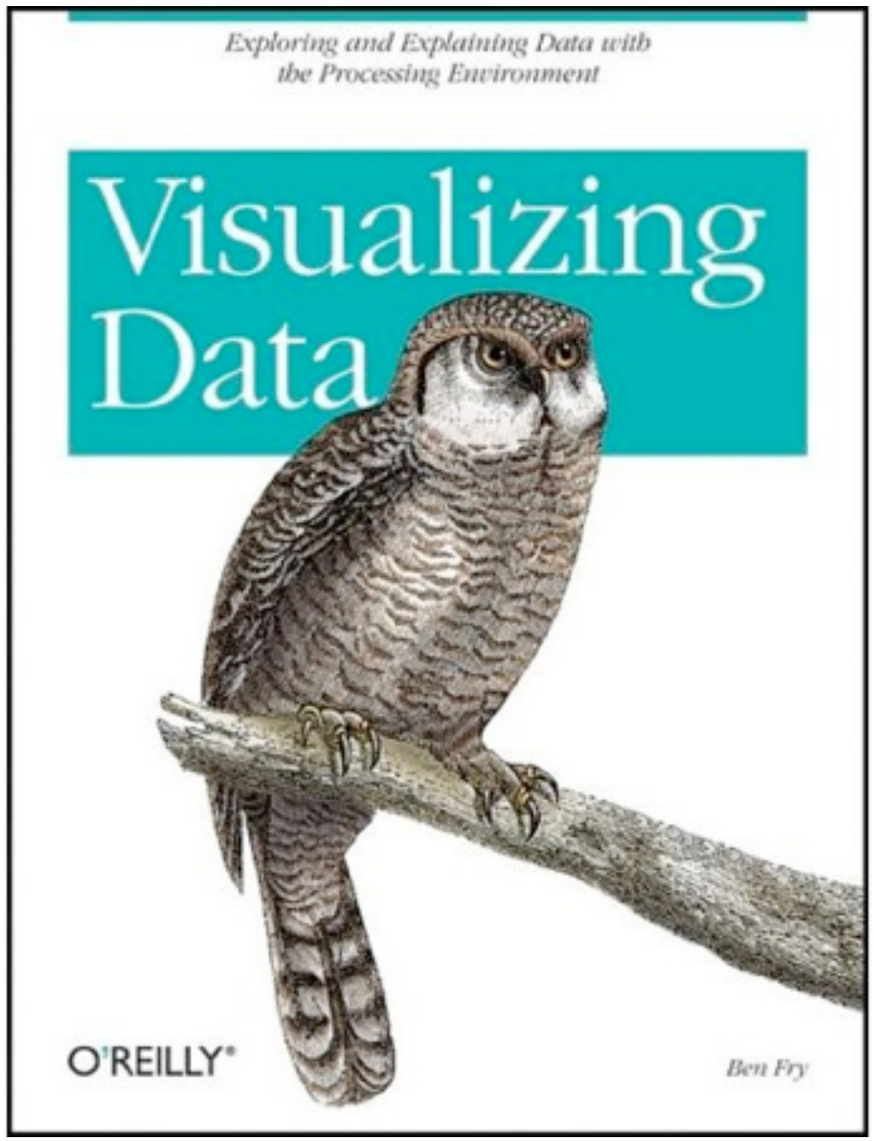


1. **Mark**

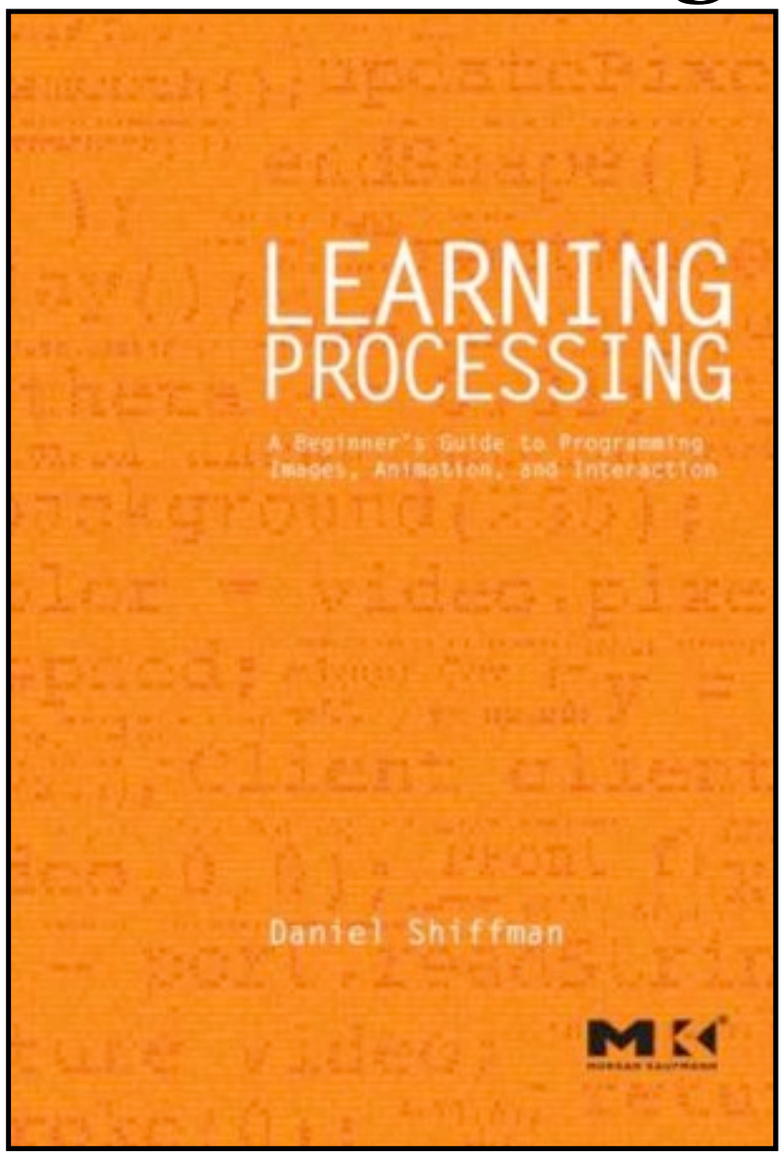
2. **Right** Click

3. *Find in Reference*

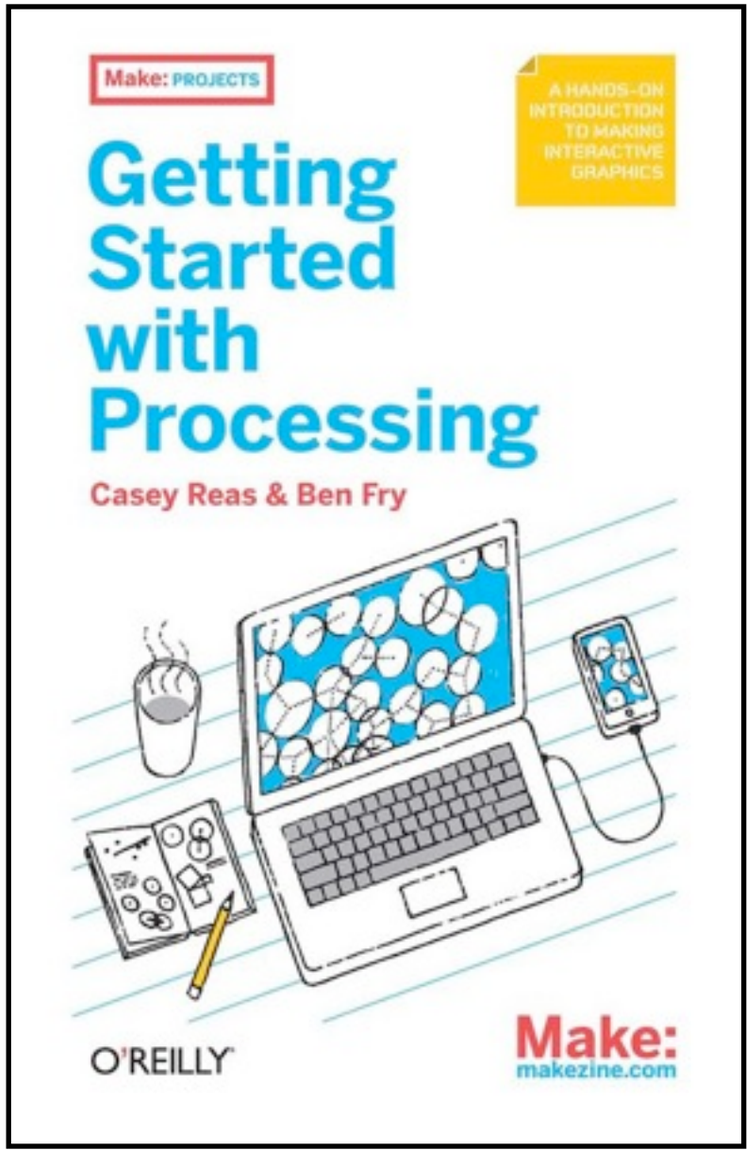
examples



how to program via Processing



quick start



HOW TO GIVE A TALK

How to Give an Academic Talk, v4.0

University of Michigan School of INFORMATION

Paul N. Edwards
School of Information
University of Michigan

pne.people.si.umich.edu

RECOMMENDED READING

- **great ideas are worthless if you keep them to yourself**

- **good papers and talks are a fundamental part of research excellence**
  - invest time
  - learn skills
  - practice

THINGS TO ASSUME ABOUT YOUR AUDIENCE

- **they don't know who you are**
- **they have never heard of the subject you are speaking on**
- **they just ate lunch and are ready for a nap**
- **wake them up and get them excited!**

PRINCIPLES OF EFFECTIVE TALKS

- **communicate your arguments and evidence**
- **persuade your audience they are true**
- **be interesting and entertaining**

Usually Better	*Usually Worse*
Talk	Read
Stand	Sit
Move	Stand still
Vary the pitch of your voice	Speak in a monotone
Speak loudly, facing the audience	Mumble, facing downward
Make eye contact	Stare at your laptop
Focus on main points	Get lost in details
Use outlines, images, and charts	Have no visual aids
Finish within your time limit	Run overtime
Rehearse	Don't practice because you're too busy working on the slides
Summarize your main points at the beginning and end	Start without an overview; trail off without a conclusion
Notice your audience and respond to its needs	Ignore audience behavior
Emulate excellent speakers	Emulate your advisor, even if s/he gives lousy talks

Usually Better	*Usually Worse*
Talk	Read
Stand	Sit
Move	Stand still
Vary the pitch of your voice	Speak in a monotone
Speak loudly, facing the audience	Mumble, facing downward
Make eye contact	Stare at your laptop
Focus on main points	Get lost in details
Use outlines, images, and charts	Have no visual aids
Finish within your time limit	Run overtime
Rehearse	Don't practice because you're too busy working on the slides
Summarize your main points at the beginning and end	Start without an overview; trail off without a conclusion
Notice your audience and respond to its needs	Ignore audience behavior
Emulate excellent speakers	Emulate your advisor, even if s/he gives lousy talks

Usually Better	*Usually Worse*
Talk	Read
Stand	Sit
Move	Stand still
Vary the pitch of your voice	Speak in a monotone
Speak loudly, facing the audience	Mumble, facing downward
Make eye contact	Stare at your laptop
Focus on main points	Get lost in details
Use outlines, images, and charts	Have no visual aids
Finish within your time limit	Run overtime
Rehearse	Don't practice because you're too busy working on the slides
Summarize your main points at the beginning and end	Start without an overview; trail off without a conclusion
Notice your audience and respond to its needs	Ignore audience behavior
Emulate excellent speakers	Emulate your advisor, even if s/he gives lousy talks

Usually Better	*Usually Worse*
Talk	Read
Stand	Sit
Move	Stand still
Vary the pitch of your voice	Speak in a monotone
Speak loudly, facing the audience	Mumble, facing downward
Make eye contact	Stare at your laptop
Focus on main points	Get lost in details
Use outlines, images, and charts	Have no visual aids
Finish within your time limit	Run overtime
Rehearse	Don't practice because you're too busy working on the slides
Summarize your main points at the beginning and end	Start without an overview; trail off without a conclusion
Notice your audience and respond to its needs	Ignore audience behavior
Emulate excellent speakers	Emulate your advisor, even if s/he gives lousy talks

Usually Better	*Usually Worse*
Talk	Read
Stand	Sit
Move	Stand still
Vary the pitch of your voice	Speak in a monotone
Speak loudly, facing the audience	Mumble, facing downward
Make eye contact	Stare at your laptop
Focus on main points	Get lost in details
Use outlines, images, and charts	Have no visual aids
Finish within your time limit	Run overtime
Rehearse	Don't practice because you're too busy working on the slides
Summarize your main points at the beginning and end	Start without an overview; trail off without a conclusion
Notice your audience and respond to its needs	Ignore audience behavior
Emulate excellent speakers	Emulate your advisor, even if s/he gives lousy talks

Usually Better	*Usually Worse*
Talk	Read
Stand	Sit
Move	Stand still
Vary the pitch of your voice	Speak in a monotone
Speak loudly, facing the audience	Mumble, facing downward
Make eye contact	Stare at your laptop
Focus on main points	Get lost in details
Use outlines, images, and charts	Have no visual aids
Finish within your time limit	Run overtime
Rehearse	Don't practice because you're too busy working on the slides
Summarize your main points at the beginning and end	Start without an overview; trail off without a conclusion
Notice your audience and respond to its needs	Ignore audience behavior
Emulate excellent speakers	Emulate your advisor, even if s/he gives lousy talks

Usually Better	*Usually Worse*
Talk	Read
Stand	Sit
Move	Stand still
Vary the pitch of your voice	Speak in a monotone
Speak loudly, facing the audience	Mumble, facing downward
Make eye contact	Stare at your laptop
Focus on main points	Get lost in details
Use outlines, images, and charts	Have no visual aids
Finish within your time limit	Run overtime
Rehearse	Don't practice because you're too busy working on the slides
Summarize your main points at the beginning and end	Start without an overview; trail off without a conclusion
Notice your audience and respond to its needs	Ignore audience behavior
Emulate excellent speakers	Emulate your advisor, even if s/he gives lousy talks

- **move around**
  - easier to keep focus on someone that is moving
  - shows enthusiasm
  - but, don't overdo it

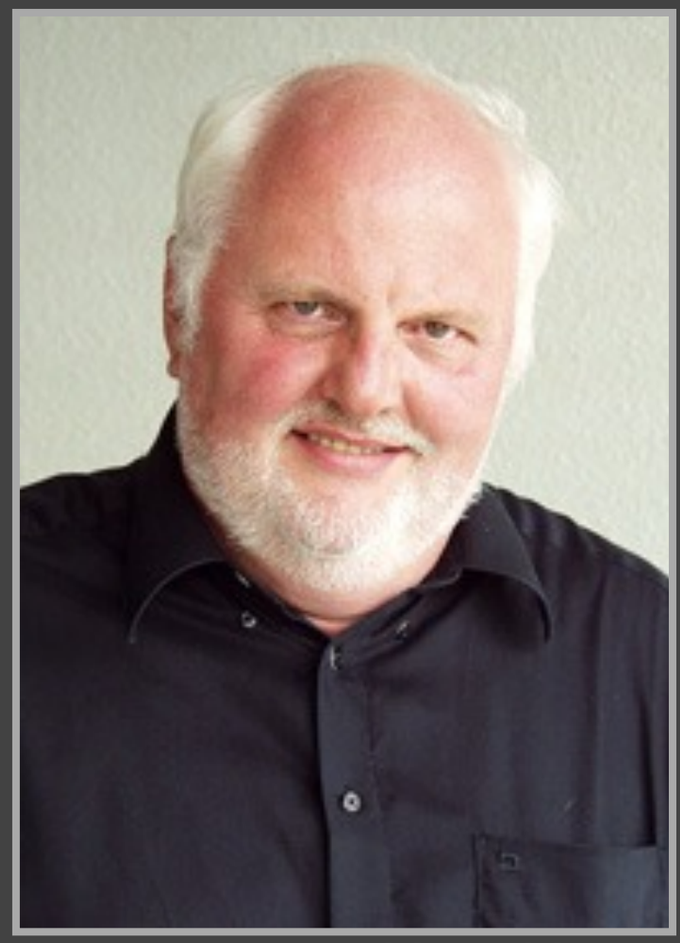
- **vary the pitch of your voice**
  - monotones are sleep-inducing
  - voice or video record yourself
- **speak loudly and clearly, and face the audience**
  - most people don't realize how softly they speak
  - give your talk to the audience, not your slides
  - minimal text on your slides helps with this
  - make eye-contact with the whole audience

- **summarize your talk at the beginning and end**
- tell ‘em what you’re gonna tell ‘em
- tell ‘em
- tell ‘em what you told ‘em

- **finish within your time limit**
  - practice the entire talk
  - use a timing device
  - decide in advance what you can skip
  - rule-of-thumb is 1.25 minutes per slide
    - *18 minute presentation is ~14 slides*

- **practice, practice, practice**
- don’t plan to improvise, rehearse everything

DEALING WITH NERVES



Hans Hagen

NUTS & BOLTS

Nancy Duarte: The secret structure of great talks | Video on TED.com

http://www.ted.com/talks/nancy_duarte_the_secret_structure_of_great_talks.html

Google Maps Wikipedia UT hiking

Sign In | Register

TED Ideas worth spreading

Talks | Speakers | Themes | Translations

TED Conferences | TEDx Events | TED Prize | TED Fellows

TED Conversations | TED Community

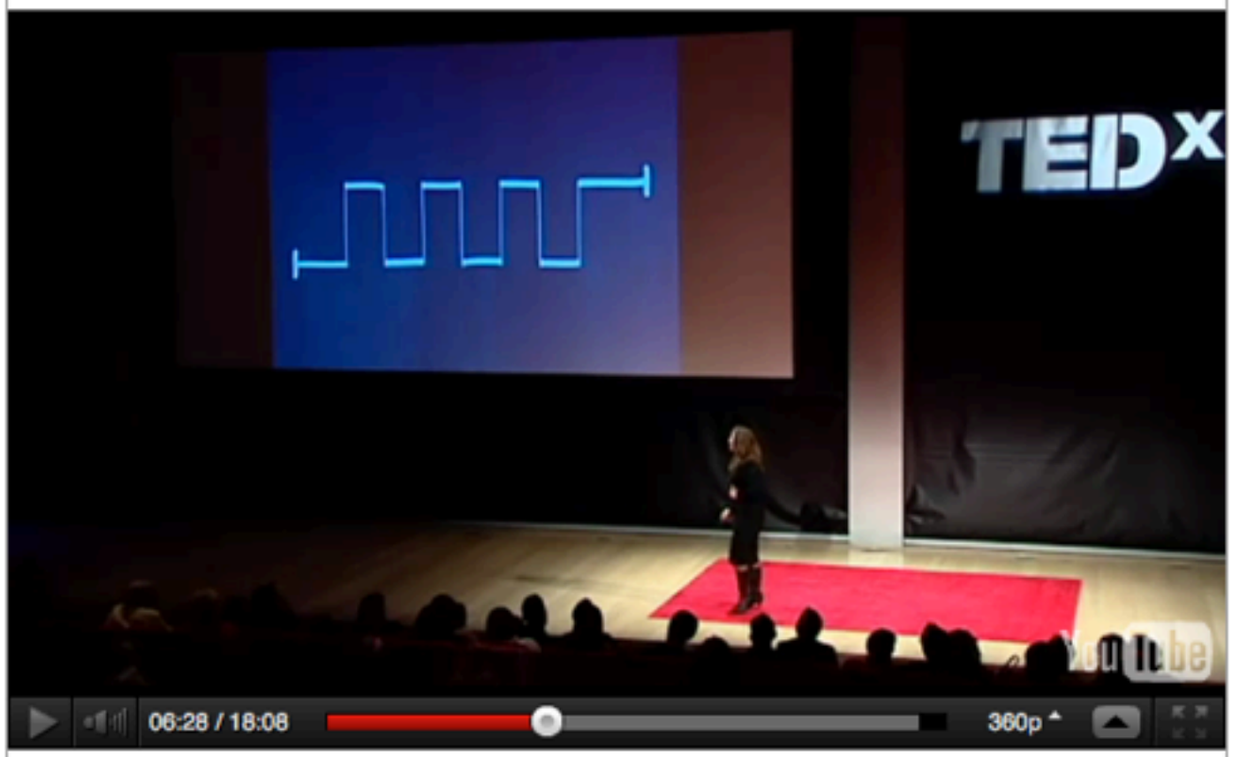
About TED | TED Blog | TED Initiatives

Search

TALKS | TEDX

Nancy Duarte: The secret structure of great talks

TEDxEast, Filmed Nov 2011; **Posted** Feb 2012



This talk was filmed at an independently organized TEDx event.

Rate

Watch more TEDxTalks »
Learn more about the TEDx Program »
Learn more about TEDxEast »

Tweet this talk! (we'll add the headline and the URL)

Post to:

420,193 Views

Like 8k

From the "I have a dream" speech to Steve Jobs' iPhone launch, all great presentations have a common architecture. At TEDxEast, Nancy Duarte draws lessons on how to make a powerful call-to-action.

Nancy Duarte believes that ideas are the most powerful tools people have. Her passion is to help every person learn to communicate their world-changing idea effectively. Full bio »

WHAT TO WATCH NEXT

David S. Rose on pitching to VCs
14:39 Posted: Sep 2008
Views **255,759** | Comments **75**

Joe Sabia: The technology of storytelling
03:51 Posted: Nov 2011
Views **569,258** | Comments **102**

STRUCTURE

- **rule-of-thumb: you have 2 minutes to engage your audience before they doze off**
  - Why should I stay awake for this talk?
  - What is the problem?
  - Why is it an interesting problem?
- **starting with the outline is a waste of time**

STRUCTURE

-**talk about the problem**

-**talk about the solution**

-**talk about where this will lead us**

-**repeat**

SLIDES

- **background**
  - choose solid color, preferable white or black
  - don't let the background compete with the foreground
- **avoid too much text**
  - no full sentences
- **keep the text readable**
  - rule-of-thumb: nothing smaller than 28 pt font
- **save animation for emphasis**

Williams’s design principles

C

R

A

P

Williams's design principles

Contrast
Repetition
Alignment
Proximity

PRINCIPLE OF CONTRAST

If two items are not exactly the same, then make them different. Really different.

Don’t be a wimp.

ANOTHER NEWSLETTER!

January First 2005

Exciting Headline

Wants pawn term dare worsted ladle gull hoe hat search putty yowler coils debt pimple colder Guilty Looks. Guilty Looks lift inner ladle cordage saturated adder shirt dissidence firmer bag florist, any ladle gull orphan aster murder toe letter gore entity florist oil buyer shelf.

Thrilling Subhead

"Guilty Looks!" crater murder angularly. "Hominy terms area garner asthma suture stooped quiz-chin? Golter door florist? Sordidly NUT!"

"Wire nut, murder?" wined Guilty Looks, hoe dint peony tension tore murder's scaldings.

"Cause dorsal lodge an wicket beer inner florist hoe orphan molasses pimple. Ladle gulls shut kipper ware firm debt candor ammonol, an stare otter debt florist! Debt florist's mush toe dentures furry ladle gull!"

Another Exciting Headline

Wail, pimple oil-wares wander doe wart udder pimple dum wampum toe doe. Debt's jest hormone nurture.

Wan moaning, Guilty Looks dissipater murder, an win entity florist. Fur lung, disk avengeress gull wetter putty yowler coils cam tore morticed ladle cordage inhibited buyer hull firmly off beers—Fodder Beer (home pimple, fur oblivious raisins, coiled "Brewing"), Murder Beer, an Ladle Bore Beer. Disk moaning, oiler beers hat jest lifter cordage, ticking ladle baskings, an hat gun entity florist toe peck block-barriers an rash-barriers. Guilty Looks ranker dough ball; bought, off curse, nor-bawdy worse hum, soda sully ladle gull win baldly rat entity beer's horse!

Boring Subhead

Honor tipple inner darning rum, stud tree boils fuller sop—wan grade bag boiler sop, wan muddle-sash boil, an wan tawny ladle boil. Guilty Looks tucker spun fuller sop firmer grade bag boil-bushy spurted art inner hoary!

"Arch!" crater gull, "Debt sop's toe hart—barns mar mouse!"

Dingy traitor sop inner muddle-sash boil, witch worse toe coiled. Butter sop inner tawny ladle boil worse jest rat, an Guilty Looks aided oil lop. Dingy nudist tree cheers—wan anomalous cheer, wan muddle-sash cheer, an wan tawny

Another Newsletter!

January First 2525

Exciting Headline

Wants pawn term dare worsted ladle gull hoe hat search putty yowler coils debt pimple colder Guilty Looks. Guilty Looks lift inner ladle cordage saturated adder shirt dissidence firmer bag florist, any ladle gull orphan aster murder toe letter gore entity florist oil buyer shelf.

Thrilling Subhead

"Guilty Looks!" crater murder angularly. "Hominy terms area garner asthma suture stooped quiz-chin? Golter door florist? Sordidly NUT!"

"Wire nut, murder?" wined Guilty Looks, hoe dint peony tension tore murder's scaldings.

"Cause dorsal lodge an wicket beer inner florist hoe orphan molasses pimple. Ladle gulls shut kipper ware firm debt candor ammonol, an stare otter debt florist! Debt florist's mush toe dentures furry ladle gull!"

Another Exciting Headline

Wail, pimple oil-wares wander doe wart udder pimple dum wampum toe doe. Debt's jest hormone nurture.

Wan moaning, Guilty Looks dissipater murder, an win entity florist. Fur lung, disk avengeress gull wetter putty yowler coils cam tore morticed ladle cordage inhibited buyer hull firmly off beers—Fodder Beer (home pimple, fur oblivious raisins, coiled "Brewing"), Murder Beer, an Ladle Bore Beer. Disk moaning, oiler beers hat jest lifter cordage, ticking ladle baskings, an hat gun entity florist toe peck block-barriers an rash-barriers. Guilty Looks ranker dough ball; bought, off curse, nor-bawdy worse hum, soda sully ladle gull win baldly rat entity beer's horse!

Boring Subhead

Honor tipple inner darning rum, stud tree boils fuller sop—wan grade bag boiler sop, wan muddle-sash boil, an wan tawny ladle boil. Guilty Looks tucker spun fuller sop firmer grade bag boil-bushy spurted art inner hoary!

"Arch!" crater gull, "Debt sop's toe hart—barns mar mouse!"

Dingy traitor sop inner muddle-sash boil, witch worse toe coiled. Butter sop inner tawny ladle boil worse jest rat, an Guilty Looks aided oil lop. Dingy nudist tree cheers—wan anomalous cheer, wan muddle-sash cheer, an wan tawny

Williams 1994

PRINCIPLE OF REPETITION

Repeat some aspect of the design throughout the entire piece.

Terence English

- Stratford-upon-Avon, England

Objective

- To make money

Education

- Stratford Grammar School, I think
- Definitely not University

Employment

- Actor
- Play broker
- Shareholder of Globe Theatre

Favorite Activities

- Suing people for small sums
- Chasing women

References available upon request.

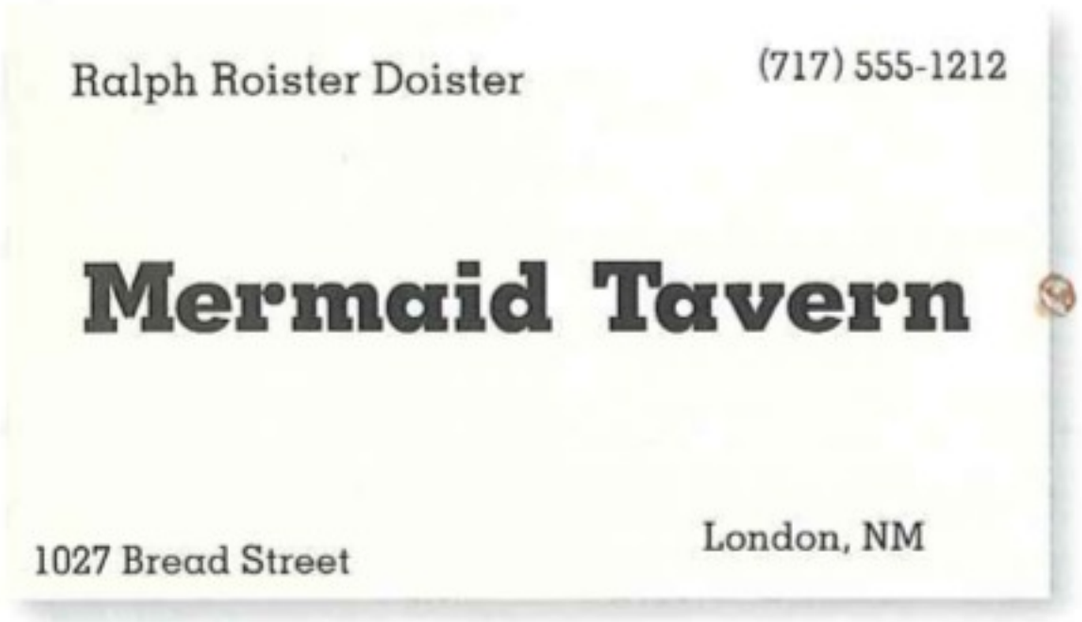
REPETITIONS

bold typeface
light typeface
square bullets
indents
spacing
alignments

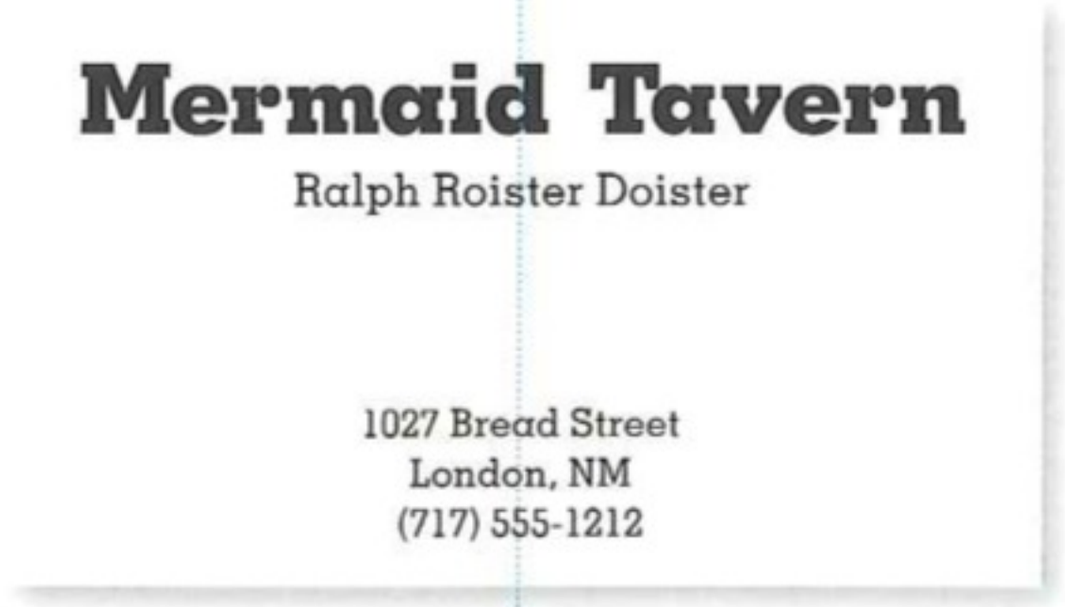
Williams 1994

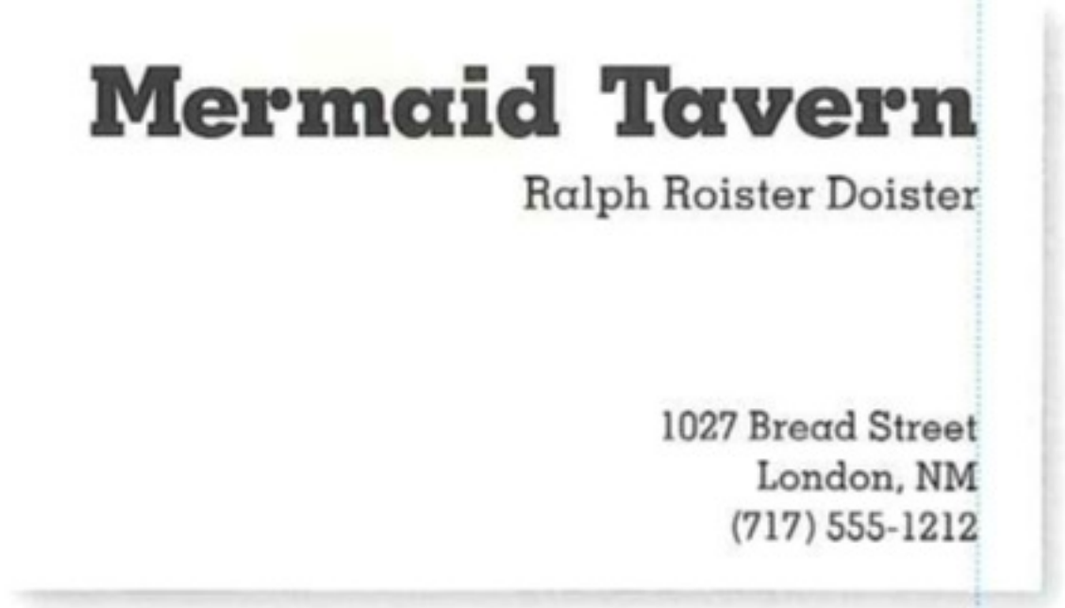
PRINCIPLE OF ALIGNMENT

Nothing should be placed on the page arbitrarily. Every item should have a visual connection with something else.



strength of edge gives strength to the layout





Williams 1994

PRINCIPLE OF PROXIMITY

Group related items together . . . physical closeness implies a relationship.

Correspondences
Flowers, herbs, trees, weeds
Ancient Greeks and Romans
Historical characters
Quotes on motifs
Women
Death
Morning
Snakes
Language
Iambic pentameter
Rhetorical devices
Poetic devices
First lines
Collections
Small printings
Kitschy
Dingbats
Thematic
Villains and saints
Drinks and recipes
Music
Quizzes
Fun but difficult quizzes

Correspondences
Flowers, herbs, trees, weeds
Ancient Greeks and Romans
Historical characters

Quotes on motifs
Women
Death
Morning
Snakes

Language
Iambic pentameter
Rhetorical devices
Poetic devices
First lines

Collections
Small printings
Kitschy
Dingbats

Thematic
Villains and saints
Drinks and recipes
Music

Quizzes
Fun but difficult quizzes

Williams 1994

FOR YOUR PRESENTATIONS

PAPER PRESENTATIONS

- **analysis of the methods and papers**
  - use the language and framework discussed in class
- **critique of the methods and papers**
  - have an opinion!
  - argue your point based on what we've been talking about this semester

VISUALIZATION FRAMEWORK CHEAT SHEET

DATA TYPES
-tabular
-networks
-text

DATA ATTRIBUTE TYPES
-categorical
-ordinal
-quantitative (sequential / diverging)

SPECIAL DATA / ATTRIBUTE SEMANTICS
-spatial / abstract
-temporal / static
-continuous / discrete
-independent / dependent

VISUALIZATION ANALYSIS TASKS
-retrieve value
-filter
-compute derived data
-find extremum
-sort
-determine range
-characterize distribution
-find outliers
-cluster
-correlate

CLASSES OF INTERACTION
-changing selection
-changing highlighting
-changing view | navigation
-changing spatial ordering | sortin

VISUAL LAYERING
-global compositing
-item-level stacking

LINKING
-linked highlighting
-linked navigation

VIEW CHOICES
-encoding: multiform
-dataset: small multiple
-data: overview + detail
-conditioning

ZOOMING
-geometric
-semantic

FOCUS + CONTEXT
-selective filtering
-geometric distortion
-selective highlighting | suppression

L18: Design studies

REQUIRED READING

Visual exploration and analysis of historic hotel visits

Chris Weaver[1]
David Fyfe[1]
Anthony Robinson[1]
Deryck Holdsworth[1]
Donna Peuquet[1]
Alan M. MacEachren[1]

[1] *The Pennsylvania State University, University Park, PA, U.S.A.*

Correspondence:
Chris Weaver, 302 Walker Building,
The Pennsylvania State University,
University Park, PA 16802, U.S.A.
Tel: +1 814 865 3472;
Fax: +1 814 863 7943;
E-mail: cweaver@psu.edu

Abstract
Understanding the spatial and temporal characteristics of individual and group behavior in social networks is a critical component of visual tools for intelligence analysis, emergency management, consumer analysis, and human geography. Identification and analysis of patterns of recurring events is an essential feature of such tools. In this paper, we describe an interactive visual tool for exploring the visitation patterns of guests at two hotels in central Pennsylvania from 1894 to 1900. The centerpiece of the tool is a wrapping spreadsheet technique, called reruns, that reveals regular and irregular periodic patterns of events in multiple overlapping artificial and natural calendars. Implemented as a coordinated multiple view visualization in Improvise, the tool is in ongoing development through an iterative process of data collection, transcription, hypothesis, design, discovery, analysis, and evaluation in close collaboration with historical geographers. Numerous discoveries have driven additional data collection from archival newspaper and census sources, as well as plans to enhance analysis of spatial patterns using historic weather records and railroad schedules. Distributed online evaluations of usability and usefulness have resulted in feature and design recommendations that are being incorporated into the tool.
Information Visualization (2007) **6,** 89–103. doi:10.1057/palgrave.ivs.9500145

Keywords: Geovisual analytics; exploratory visualization; historical geography; coordinated multiple views; social behavior analysis; serial periodic data

Introduction

Promoting the development of integrated software for visual data analysis is a key facet of the research and development agenda for visual analytics.[1] In both information and geographic visualization, an important goal is

MizBee: A Multiscale Synteny Browser

Miriah Meyer, Tamara Munzner, *Member, IEEE*, and Hanspeter Pfister, *Senior Member, IEEE*

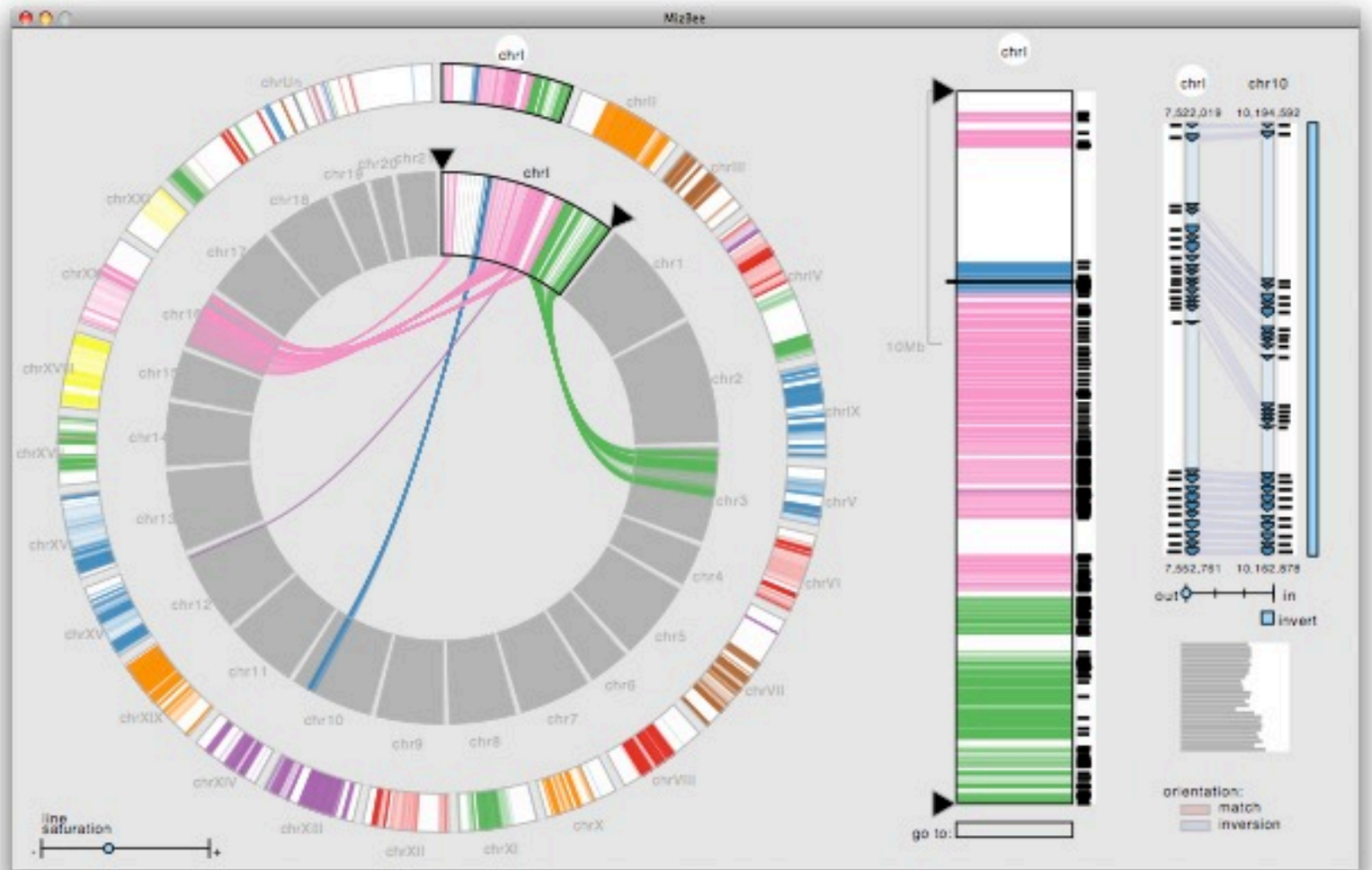


Fig. 1. The multiscale MizBee browser allows biologists to explore many kinds of conserved synteny relationships with linked views at the genome, chromosome, and block levels. Here we compare the genomes of two fish, the stickleback and the pufferfish.

Abstract—In the field of comparative genomics, scientists seek to answer questions about evolution and genomic function by comparing the genomes of species to find regions of shared sequences. Conserved syntenic blocks are an important biological data abstraction for indicating regions of shared sequences. The goal of this work is to show multiple types of relationships at multiple scales in a way that is visually comprehensible in accordance with known perceptual principles. We present a task analysis for this domain where the fundamental questions asked by biologists can be understood by a characterization of relationships into the four types of proximity/location, size, orientation, and similarity/strength, and the four scales of genome, chromosome, block, and genomic feature. We also propose a new taxonomy of the design space for visually encoding conservation data. We present MizBee, a multiscale synteny browser with the unique property of providing interactive side-by-side views of the data across the range of scales supporting exploration of all of these relationship types. We conclude with case studies from two biologists who used MizBee to augment their previous automatic analysis work flow, providing anecdotal evidence about the efficacy of the system for the visualization