

# GSAPP Sp18 DV Syllabus

## Data Visualization for Architecture, Urbanism and the Humanities

- Columbia GSAPP Visual Studies | A4894 Spring 2018
- Wednesdays 6:30–8:30pm | 114 Avery
- Instructor: Agnes Chang (ac3882)

### Course Overview

This course provides an introduction to data visualization theory and methods for students entirely new to the fields of computation and information design. Through a series of in-class exercises and take-home assignments, students will learn how to critically engage and produce interactive data visualization pieces that can serve as exploratory and analytical tools. The course is part of a larger initiative, hosted by the [Center for Spatial Research](#) to teach courses in the critical use of digital tools across fields in architecture, urbanism, and the humanities.

The course will be centered around a semester long data visualization group project, through which the students will learn the basics of data visualization, data analysis, data collection, programming and version control. However, even though the course will teach specific visualization tools, the main conceptual thread will be centered around how to work with data, both in the humanities and in architecture and urbanism. Students will define their final projects around their own interests, and will bring their own datasets into their final projects.

### General Topics

- Data visualization history and concepts
- Working with data: collection and analysis
- Basic programming skills and web languages (HTML, CSS, Javascript)
- Interactivity and online data visualization
- Collaborative work and version control (GitHub)
- Working with text data
- APIs and Web-scraping
- Generative art

### Schedule

WEEK	LECTURE	ASSIGNMENT
1	<b>JAN 17</b> Syllabus overview What is data viz? What is code?	<a href="#">Data Humanism</a> by Georgia Lupi <a href="#">Digital Networks, Public Spaces</a> pp.14-15 <i>DPS, Future Everything</i>

	(slides)	P5.js <a href="#">Getting Started</a> , <a href="#">Color Intro-Chp.3</a> Braitenburg <a href="#">Vehicles</a> (1986). — <a href="#">A0 Sharpie Instructions</a> <a href="#">A1.1 Helloworld: 1+2+3</a>
2	<b>JAN 24</b> Digital drawing 101: mental models Web tech 101: servers, browsers, HTML, CSS, JS Coding: version control, Github (slides)	<a href="#">What is Code? Form + Code</a> Chp. 1 <a href="#">Understanding Comics, Chp. 5,7,8</a> by Scott McCloud <a href="#">Interaction of Color, Excerpts</a> by Josef Albers — <a href="#">A1.2 Helloworld: add time</a> <a href="#">A2.1 Clocks: sketches (no code)</a>
3	<b>JAN 31</b> Programming 101: var, loop, if-else, functions Coding: psuedocode, art of debugging (slides)	<a href="#">Learning Processing: Chp. 4-7, 9, 11</a> by Shiffman, D. (For reference: <a href="#">O'Reilly JavaScript book</a> by Flanagan, D.) — <a href="#">A2.2 Clocks: choose three to code</a>
4	<b>FEB 7</b> Coding: strings, layout, JSON Web tech 201: APIs (slides)	<a href="#">Learning Processing: Chp. 8, 10, 17-19</a> by Shiffman, D. <a href="#">Evolution of a Scientific American Graphic</a> by Accurat Studio, 2016 <a href="#">Design and Redesign in Data Visualization</a> by Viegas & Wattenberg — <a href="#">A3.1 Text: one dataset visualized two ways</a>
5	<b>FEB 14</b> Data viz: qualitatives + interactives Interaction design 101: “info architecture”, hierarchy, user journey, states Coding: mouse input, randomize	<a href="#">The death of interactive infographics?</a> by Baur, D. <a href="#">In Defense of Interactive Graphics</a> by Aisch, G. <a href="#">You Say Data, I Say System</a> by Jer Thorp — <a href="#">A3.2 Text: make one interactive</a>
6	<b>FEB 21</b> Data viz: quantitative Coding: data types, parse, format, collect	Chp. TBD from <a href="#">Data Visualization</a> by Kirk, A. <a href="#">A Brief History of Data Visualization</a> by Friendly, M. —

		<a href="#">A4.1 Geography</a> : 1 dataset, 3 layers, 1 coded
7	<b>FEB 28</b> Data viz: multi-view interactives Statistics 101: what are you comparing? dimensions, distributions, correlations Coding: animation	<i>TBD</i> — <a href="#">A4.2 Geography</a> : multi-view interactive
8	<b>MAR 7</b> Data viz: infographic satire Statistics 201: abstraction pitfalls, descriptive stats, inference, probability	<a href="#">Artificial Intelligence's White Guy Problem</a> by Crawford, K. What's the Point? Chp. 1 from <i>Naked Statistics</i> — <a href="#">A5 Misrepresentation</a>
	<b>MAR 14</b> <i>Spring Break—no class</i>	
9	<b>MAR 21</b> Programming 201: generative aesthetics, systems, and simulations	<a href="#">In Theory and Practice</a> Chp. 1 from <i>Generative Art: A Practical Guide</i> — <a href="#">A6 Generative Form</a>
10	<b>MAR 28</b> Beyond: 3D drawing, natural language processing and machine learning	<a href="#">A7.1 Final</a> : 3 proposals
11	<b>APR 4</b> Proposal pin-up	<a href="#">A7.2 Final</a> : 3 dataset explorations
12	<b>APR 11</b> Dataset pin-ups	<a href="#">A7.3 Final</a> : working prototype
13	<b>APR 18</b> Desk crits	<a href="#">A7.4 Final</a> : polishes & documentation
14	<b>APR 25</b> <i>Final Review</i>	

## Grading

- 45% Weekly Assignments
- 30% Final Project
- 25% Participation and Discussion

## Assignments Overview

- [A0 Sharpie Instructions](#): letter-size sheet of paper + a sharpie. I'll explain.
- [A1 Helloworld](#): setting up github, p5.js, and your homepage.
- [A2 Clocks](#): a series of exercises in visualizing time.
- [A3 Text](#): working with and text data, layout, and basic interactivity.

- [A4 Geography](#): working with more complex datasets (e.g. Census, World Bank), multiple dimensions, and more interactivity.
- [A5 Misrepresentation](#): design, as critique, a visualization that is misleading while being a technically accurate representation of the data set.
- [A6 Generative Form](#): build a generative aesthetic representation of a self-chosen dataset.
- [A7 Final Project](#): follow your own data adventure and define a project around your own interests.

## Logistics

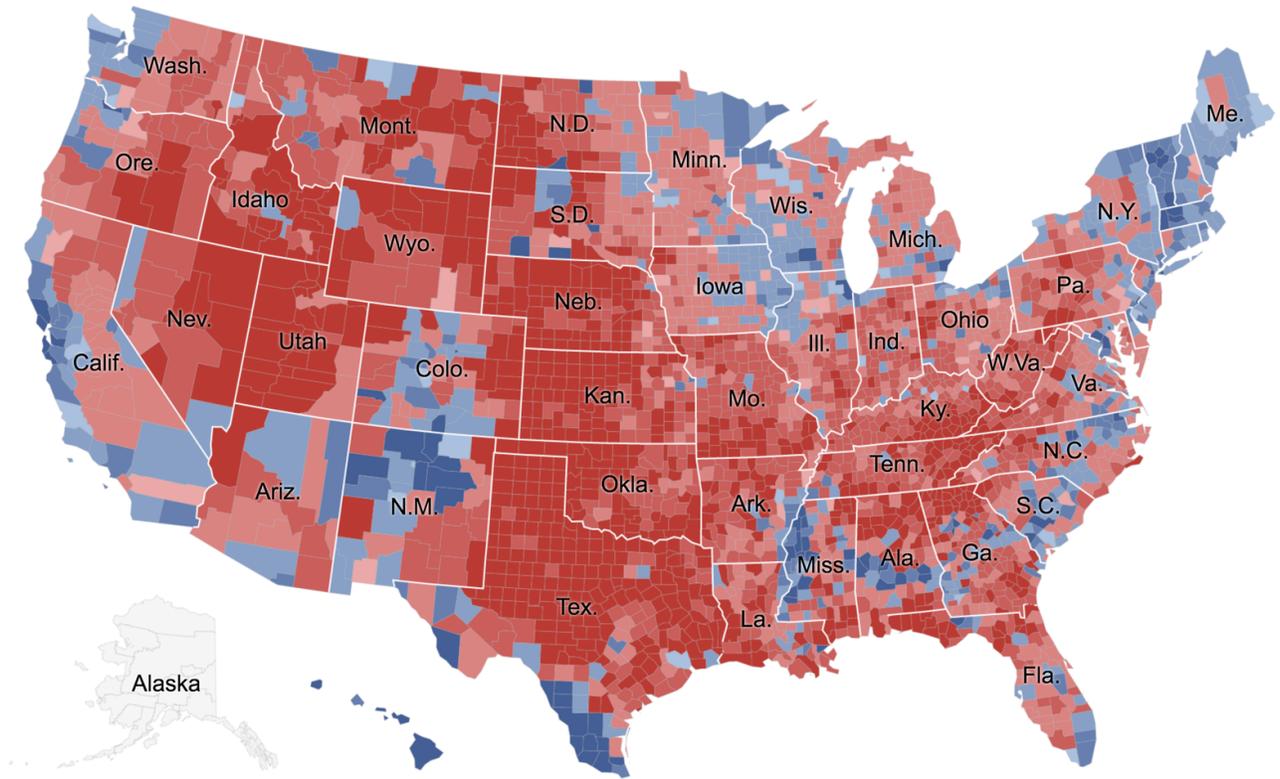
- Unless otherwise noted, each week we will begin class with 3min. presentations and discussion on the weekly assignment and reading. There are no group assignments.
- Lecture slides, readings, assignments and tutorials will be posted to the course website unless otherwise announced.
- Post questions, ideas, confusions, complaints and excitement to Piazza. Office hours by individual appointment.

## Caveat Emptor

Reasons you might plausibly want to take or drop this class:

- This class is about “learning by making”: we will read and we will discuss, but it’s mainly about making.
- There will be code in this class: you are not expected to have prior programming experience and class lectures and materials will reflect this expectation, but if that is the case, expect to spend more time on your first few assignments than your peers.
- We will use p5.js as the main development platform in this class but you are welcome to choose other tools as long as your work can be presented on the web. You are otherwise encouraged to combine your workflow with other tools you are already familiar with (analog or digital!)
- While the main theme of this class is geospatial data—i.e. datasets that capture an aspect of the human relationship to space and geography—this class will not teach you how to make charts, maps, or choropleths\*. Instead, the goal is to help you learn to make flexible, custom visual representations.

(\*This is a choropleth:



(source: nytimes.com)