Parsons School of Design
MFA Design and Technology

DATA VISUALIZATION

PGTE 5598 | CRN 3481 | Spring 2017
Wednesdays, 7:00 - 9:40 p.m. at 6 East 16th St, Room 1004

Faculty: Umi Syam (umi@newschool.edu). *Office hours by email only.*
Teaching Assistant: Soomi Lee (lees105@newschool.edu)

Course Description
At what point does data become narrative and how can we, as designers, facilitate this transformation? How can we design interfaces and systems that will draw on generated data to show compelling stories, patterns, and points of view? This course will allow students access to a variety of datasets and APIs from the public domain such as article text, metadata (keywords, geotags, etc.), and archival data. Using these APIs, students will develop generative interfaces and data visualization projects that create dynamic views into the news and data of the present and the past.
Open to: Masters degree in Design & Technology majors; others by permission of Design & Technology program.

Learning Outcomes
By the successful completion of this course, students will be able to:
● Be familiar with the fundamental graphical principles as well as the lexicon and history of data visualization.
● Demonstrate competence in visually re-configuring and mapping data to present and support an argument
● Critically analyze the various methods and techniques to visualize data.
● Have better intuition about the appropriate use of different design strategies to create effective visualizations for a wide range of purposes.

Course Outline
This course will consist of lectures and workshops. Lectures will focus on introducing new concepts and techniques, while workshops will allow students to implement the things they've learned in the context of their own project of interest. Topics of the session below are subject to change as the course progresses.

WEEK 1	1/25	Class Introduction + Syllabus Handed Out Preparing your coding environment Relearn Javascript: Back to Basics. - JS definitions - Variable and data types - Arrays vs Objects - Functions: Declarations and Expressions - Iteration and Conditionals statement - Scope and closure Github setup for project submission. Create individual repository	

WEEK 2	2/1	What is data visualization?
		What makes a good data visualization?
		Infographics vs Data visualization
		Pragmatic vs Artistic Visualization
		Understanding Data: The Fundamentals
		   - Data variability, uncertainty, context, source, privacy, accessibility
		   - Data Taxonomy: types, format, and aggregation level
		Workshop: Open Refine	

WEEK 3	2/8	Visual Mapping: Process
		   - How to get from Data to Visualization
		Visualization Components:
		   - Visual cues, Coordinate system, Scale, Context
		Workshop: Open Refine
			Project 1 Proposal due

WEEK 4	2/15	Basic Charts & Maps
		Visualizing with Clarity:
		   - Visual Hierarchy, Readability, Highlighting, Annotation
		High Information Graphics: Rich design density, perception and visual thinking
		Dynamic Visualization: Interactivity
		   - Introducing motion on the web
		   - When to go interactive
		   - How to think interactively	

WEEK 5	2/22	**Project 1 Presentation**	

WEEK 6	3/1	Programmatic Data Visualization
		   - Data storage: between API vs Static files vs Database
		   - Introduction to SVG
		Introduction to P5.js
		   - Drawing Basics
		   - Randomness & Perlin Noise
		   - Working with external data file
		   - Working with API and Bubble Charts	

WEEK 7	3/8	P5.js
		   - Working with text: Word-counting and Text Analysis
		   - Making dot plots / scatter plots / line plots	

WEEK 8	3/15	Guest Lecturer	Project 2 Proposal due
	3/22	Spring break - NO CLASS	
WEEK 9	3/29	**Project 2 Presentation**	
WEEK 10	4/5	Introduction to D3.js - What is it and what can it do	

		- Basic data manipulation, munging, and processing in JavaScript - DOM manipulation - Data transformation - D3 Scales	

WEEK 11	4/12	More D3.js
		    - D3 Transition (animation)
		    - Basic charts: Line plots / scatter plots
		Bonus Topic: Maps & Cartography
		    - Map projections
		    - Basic map features: styling, mapping geojson, tooltip, zoom
		    - Advanced: Point Translation	

WEEK 12	4/19	Visualization as a Medium
		    - Types: Analysis & Exploration, Infographics & Presentation, Entertainment/Humor, Data Art
		An Introduction to Visual Journalism & Data Storytelling:
		    - History, Process, and Application
		    - Designing for an audience: Do you need to visualize everything?
		Hands-on:
		    - Making Interactive Scrollers and Steppers
			Project 3 Proposal due

WEEK 13	4/26	1:1 and working sessions
		    - Reviewing proposal idea
		    - Showing precedent & any technical challenges	

WEEK 14	5/3	1:1 and working sessions - Progress update	
WEEK 15	5/10	**Final Project Presentation + Crits**	

Assessable Tasks

A. Inspiring DataViz Example Presentation

Every week, 1-2 students will take turn presenting one example of a data visualization project. In a short 3-5 minute presentation, talk about these points:
- Why have you chosen this example?
- Who is the author of the project?
- Where is the data from?
- What are the tools?
- What is the main audience/context/purpose?
- What is working?
- What would you improve?

For an inspiring reflection on data visualization critique, check out Fernanda Viegas and Martin Wattenberg's *Design and Redesign*. Please beware of your presentation's date, which will be assigned during the first class.

B. Projects

There will be no weekly homework but instead, three big projects along this course. All must be submitted through your personal Github repo. The basic and general requirements are:

1. You must clearly state the focus, intent, and tone of your project and how your solutions relate to them.
2. You should also demonstrate a deep understanding of the data you used, mentioning sources and transformations.
3. Finally, you should be able to present your findings and explain further what works/what doesn't.

Project #1 - Freeform Data Visualization

Using no or very minimal coding skills, create an engaging data visualization for communication. Any media and tools are acceptable, as long as you're comfortable producing with it. For example, if you're really good at sketching, draw them. If you're good at cooking, make your visualization edible maybe? If you're good at physical craft and/or physical computing, make your visualization in a concrete form, and so on. Choose from topic below:

- Visualize your daily life. Quantify yourself, whatever it may be, it must be your own personal data.
- Visualize a topic of your own. You are welcome to choose whichever topic and dataset that interest you.

Project #2 (Midterm) - Exploratory Visualization

Produce a visualization that allow users to interact and explore the data. General requirements apply.

Project #3 (Final) - Data Storytelling

Produce a storytelling project of any topic of your choice, that has several ways of visualizing data or showing a piece with data updates and motion. General requirements apply.

Grading Criteria

The Dataviz Example Presentation is intended to assess your critical skills, while Projects are intended to assess your capacity of creatively applying your skills. For each project, the way I grade them:

Project Grading Criteria	%
Does it meet the requirements outlined in the assignment? Does it have a clear purpose, tone, and focus?	30%
Does it work? Is it functional?	20%
Does it show effort? How polished is it?	30%
Was it submitted on time?	20%

Some additional notes:

- Your cleanliness and the organization of your code is important, but it won't be included as my grading criteria. However, you should still follow the recommended coding practises to help you be more efficient. See Gabriel Gianordoli's coding advice for more.
- I will not check your code line by line looking for bugs. So please submit your assignments as functional as possible. If the page just crashes on loading I will not be able to understand whether or not you have accomplished something. In those cases, comment out the bug and leave a note with details. For instance: "*This part should display the data, but I wasn't able to finish it.*"

Final Grade Calculation

Participation/Attendance	10%
Dataviz Example Presentation	10%
Project 1	20%
Project 2 (Midterm)	30%
Project 3 (Final)	30%
TOTAL	100%

Recommended Readings

Edward R. Tufte. *The Visual Display of Quantitative Information.* 2nd ed. Graphics Pr, 2001.
Scott Murray. *Interactive Data Visualization for the Web.* ebook link
Nathan Yau. *Data Points, Visualization That Means Something.* 1st ed. Wiley, 2013.

More readings will be added in on a weekly basis depending on the subject. Check the class Github repository for a more updated list: https://github.com/umisyam/DataViz_Spring2017

Resources

The university provides many resources to help students achieve academic and artistic excellence. These resources include:

- The University (and associated) Libraries: http://library.newschool.edu
- The University Learning Center: http://www.newschool.edu/learning-center
- University Disabilities Service: www.newschool.edu/student-disability-services/

In keeping with the university's policy of providing equal access for students with disabilities, any student with a disability who needs academic accommodations is welcome to meet with me privately. All conversations will be kept confidential. Students requesting any accommodations will also need to contact Student Disability Service (SDS). SDS will conduct an intake and, if appropriate, the Director will provide an academic accommodation notification letter for you to bring to me. At that point, I will review the letter with you and discuss these accommodations in relation to this course.

Grading Standards for Graduate Course

A	Work of exceptional quality
A-	Work of high quality
B+	Very good work
B	Good work; satisfies course requirements

Satisfactory completion of a course is considered to be a grade of B or higher.

B-	Below-average work

C+	Less than adequate work
C	Well below average work
C-	Poor work; lowest possible passing grade
F	Failure
GM	Grade missing for an individual

Grades of D are not used in graduate level courses.

Grade of W
The grade of W may be issued by the Office of the Registrar to a student who officially withdraws from a course within the applicable deadline. There is no academic penalty, but the grade will appear on the student transcript. A grade of W may also be issued by an instructor to a graduate student (except at Parsons and Mannes) who has not completed course requirements nor arranged for an Incomplete.

Grade of Z
The grade of Z is issued by an instructor to a student who has not attended or not completed all required work in a course but did not officially withdraw before the withdrawal deadline. It differs from an "F," which would indicate that the student technically completed requirements but that the level of work did not qualify for a passing grade.

Grades of Incomplete
The grade of I, or temporary incomplete, may be granted to a student under unusual and extenuating circumstances, such as when the student's academic life is interrupted by a medical or personal emergency. This mark is not given automatically but only upon the student's request and at the discretion of the instructor. A Request for Incomplete form must be completed and signed by student and instructor. The time allowed for completion of the work and removal of the "I" mark will be set by the instructor with the following limitations:

Undergraduate students: Work must be completed no later than the seventh week of the following fall semester for spring or summer term incompletes and no later than the seventh week of the following spring semester for fall term incompletes. Grades of "I" not revised in the prescribed time will be recorded as a final grade of "F" by the Office of the Registrar.

Graduate students: Work must be completed no later than one year following the end of the class. Grades of "I" not revised in the prescribed time will be recorded as a final grade of "WF" (for Parsons and Mannes graduate students) or "N" (for all other graduate students) by the Office of the Registrar. The grade of "N" does not affect the GPA but does indicate a permanent incomplete.

Divisional, Program and Class Policies

● Responsibility
Students are responsible for all assignments, even if they are absent. Late assignments, failure to complete the assignments for class discussion and/or critique, and lack of preparedness for in-class discussions, presentations and/or critiques will jeopardize your successful completion of this course.

● Participation

Class participation is an essential part of class and includes: keeping up with reading, assignments, projects, contributing meaningfully to class discussions, active participation in group work, and coming to class regularly and on time.

● Attendance
Parsons' attendance guidelines were developed to encourage students' success in all aspects of their academic programs. Full participation is essential to the successful completion of coursework and enhances the quality of the educational experience for all, particularly in courses where group work is integral; thus, Parsons promotes high levels of attendance. Students are expected to attend classes regularly and promptly and in compliance with the standards stated in this course syllabus.

While attendance is just one aspect of active participation, absence from a significant portion of class time may prevent the successful attainment of course objectives. A significant portion of class time is generally defined as the equivalent of three weeks, or 20%, of class time. Lateness or early departure from class may be recorded as one full absence. Students may be asked to withdraw from a course if habitual absenteeism or tardiness has a negative impact on the class environment.

Whether the course is a lecture, seminar or studio, faculty will assess each student's performance against all of the assessment criteria in determining the student's final grade.

● Canvas
Use of Canvas may be an important resource for this class. Students should check it for announcements before coming to class each week.

● Delays
In rare instances, I may be delayed arriving to class. If I have not arrived by the time class is scheduled to start, you must wait a minimum of thirty minutes for my arrival. In the event that I will miss class entirely, a sign will be posted at the classroom indicating your assignment for the next class meeting.

● Electronic Devices
The use of electronic devices (phones, tablets, laptops, cameras, etc.) is permitted when the device is being used in relation to the course's work. All other uses are prohibited in the classroom and devices should be turned off before class starts.

● Academic Honesty and Integrity
Compromising your academic integrity may lead to serious consequences, including (but not limited to) one or more of the following: failure of the assignment, failure of the course, academic warning, disciplinary probation, suspension from the university, or dismissal from the university.

Students are responsible for understanding the University's policy on academic honesty and integrity and must make use of proper citations of sources for writing papers, creating, presenting, and performing their work, taking examinations, and doing research. It is the responsibility of students to learn the procedures specific to their discipline for correctly and

appropriately differentiating their own work from that of others. The full text of the policy, including adjudication procedures, is found at http://www.newschool.edu/policies/# Resources regarding what plagiarism is and how to avoid it can be found on the Learning Center's website: http://www.newschool.edu/university-learning-center/student-resources/

The New School views "academic honesty and integrity" as the duty of every member of an academic community to claim authorship for his or her own work and only for that work, and to recognize the contributions of others accurately and completely. This obligation is fundamental to the integrity of intellectual debate, and creative and academic pursuits. Academic honesty and integrity includes accurate use of quotations, as well as appropriate and explicit citation of sources in instances of paraphrasing and describing ideas, or reporting on research findings or any aspect of the work of others (including that of faculty members and other students). Academic dishonesty results from infractions of this "accurate use". The standards of academic honesty and integrity, and citation of sources, apply to all forms of academic work, including submissions of drafts of final papers or projects. All members of the University community are expected to conduct themselves in accord with the standards of academic honesty and integrity. Please see the complete policy in the Parsons Catalog.

● Intellectual Property Rights: http://www.newschool.edu/policies/#