InfoVis: Final Project Guideline

Over the rest of the term, you will work in teams of two (or three) on creating an interactive visualization project using JavaScript, D3, and React. Generally speaking, you will form a team, submit a proposal and a final report, and give a demo of your final visualization (we may do this via Zoom meeting, depending on the situation). The schedule is as follows,

No.	Tasks	Due date	Remark
1	Team formation	Apr 14	You may post yourself on the billboard
2	Proposal (no more than 3 pages)	Apr 21	
3	Final project code	May 9	Peer review; your works will be uploaded online, and viewed (and graded) by other classmates.
4	Final project report (no more than 4 pages); In-person demo (< 5 minutes)	May 11	Peer review, may use Zoom meeting

Grading policy

- Team formation 10%, fail to form into a team before the due date will lose the points
- Proposal 40%
- Final report and code 20%
- In-person demo/presentation 30%

General requirements

Implement a visual analysis app or interactive data-driven narrative (storytelling) visualization by D3 and React-based on the following requirements:

- Publicly available datasets (strongly recommend); self-collected datasets are allowed.
- At least two/three different views for teams of two/three (Here the term “different views” means different layouts, e.g., two bar charts only count as one view.)
- The views should use at least one of the following layouts: geo-map, node-link diagram, or treemap.
- Multiple views coordinated with linked highlighting. A click/hover/selection interaction within one view must trigger a change in a different view. Ideally, these views are linked bidirectionally.

- At least 2 UI widgets that allow users to filter the data or update certain views interactively (e.g., dropdown, radio button, range slider, blushing, etc.)
- Include interactive tooltips, in at least one view, that is, shown when users hover over marks.
- You don't necessarily need to show everything within a single-screen dashboard. You may want to use tab navigation or a scrolling approach.
- In this course project, you should put your efforts into front-end development (JavaScript, D3, React, HTML, CSS). You need to implement visualizations in D3 and React. External libraries (e.g., jQuery, leaflet.js,...) and CSS frameworks (e.g., Bootstrap) are allowed to use.

NOTE: if you have good arguments why you cannot fulfill all of the requirements above because you want to include other features, we may be able to accommodate that desire, but make sure to clear it with the instructor, Xianbin Gu (xianbin.gu@nyu.edu) first.

Team Formation 10%

- Please form a team by Nov 12, 11:59 pm. Register your team using NYU Brightspace/Tools/Group, and also, send your team information to xianbin.gu@nyu.edu.
- Work closely in teams of **two.** Teams with three members are fine but teams with more than three people are not allowed. If you have a very unusual circumstance with a strong need for a team of one, your request will be considered, and please contact Xianbin Gu (xianbin.gu@nyu.edu).
- For students in online mode, you may use GitHub to work with your teammates.
- You may join the following WeChat Group to advertise yourself, specifying your dataset or topic interests, so that you can form your team quickly. Moreover, you can post your information on the billboard: https://docs.google.com/spreadsheets/d/1ikeZ1LdtdqaT6P6F2tQpQN0G49pLfM9vf8XBXZl8khU/edit?usp=sharing

Project Proposal Requirements 40%

When submitting your project proposal as a single PDF, please include the following sections in this order:

1. Basic info (5%)
2. Overview (7%)
3. Description of the data (7%)
4. Usage scenario & task (7%)
5. Description of visualization & initial sketch (9%)

6. Work breakdown and schedule (5%)

Your proposal should be **no more** than 3 pages, including the sketches of your design. The writing of the proposal will be considered in grading. For example, good writing that clearly and effectively describes your design will get a high grade.

Section 1: Basic information

- Project title
- A list of all team members and student IDs

Section 2: Overview

Briefly describe what problem your visualization is tackling. You don't necessarily need to create a project that is purely focused on exploratory data analysis. You can choose to tell an interactive data-driven story intended to be consumed by the general public. The theme of your visualization can draw from any topic, including current affairs, history, movie or TV series stories, and research findings from the sciences and humanities.

Example:
Security is an important factor when it comes to the measurement of a city's living quality, and it often concerns people when they decide to move to a new place. We are going to propose a visualization system to help those who plan to move to Austin, Texas address their concerns. Our system will show different aspects of public security in Austin.

Section 3: Description of the data set and processing

You are free to choose any publicly available dataset(s). You may use one of these resources:

- Kaggle Datasets
- UCI Machine learning repository

Also, there are three datasets that were used in the previous semesters

- Annual crime of Austin, TX
- Movielens
- Chinese Ancient Poetry

In your report, briefly describe the dataset and the variables that you will visualize. If your dataset has a lot of variables and you plan to visualize them all, then provide a high-level descriptor of the variable types, for example, say the dataset contains demographic variables instead of describing every single variable.

Example:
I will visualize a dataset of approximately 380,000 crime records. Each record has 4 attributes that describe the information about a crime (District, Type of Offence, Report date, Location). I will also derive a new variable which is the frequency of different types of crimes.

Processing

Do you need to preprocess or clean up the original data? Do you need to join multiple datasets? How do you plan to implement the processing pipeline? (i.e., in a separate tool, such as Trifacta Data Wrangler; R scripts that are executed once; on the fly in JavaScript).

Section 4: Usage scenarios & tasks

The purpose of the usage scenario is to get you to think about how someone else might use the web application you're going to design and to think about those needs before you start hacking. Usage scenarios are typically written in a narrative style and include the specific context of usage, tasks associated with that usage context, and a hypothetical walkthrough of how the user would accomplish those tasks with your visualization. If you are using Kaggle dataset, you may use their "inspiration" to create your usage scenario, or you may come up with your own "inspiration".

Example of usage scenarios with tasks:

Arnold is a police officer of the city. He wants to get an overview of the city crime of the past year in order to plan the police patrol routes of this year. He wants to be able to see when and where every type of crime usually happens and if there is any connection between crimes and districts. When Arnold logs on this system, he will see a map of the city which is filled by small points. Each point represents a crime and is plotted at the location where it occurred. There are two drop down lists by which Arnold can select a specific crime and date and filter out others. Besides, there is a checkbox which allows Arnold to compare different crimes when checked. By selecting a typical crime, Arnold can see the distribution of the crime on the map and find the district that has the highest density of it. Then, he can click the checkbox and select another crime, which will show the selected and previous selected crimes together on the map. This can help him find the relation between the two crimes.

Section 5: Description of your visualization & sketch

Building from your usage scenario, give a high-level description of the visualization interface you will build. What are must-have features without which you would consider your project a failure? Remember to be realistic since you are actually required to implement this interactive visualization, and you will be assessed on how much, and why, your final project deviates from this initial proposal.

Briefly describe the characteristics of your "innovative view component" that is either an extension of an existing visualization type or a novel visualization type. What makes it special?

Your sketch can be hand-drawn or mocked up using a graphics editor. Don't use more than five sketches. Please note, this is a very basic illustrative guide that should help you during the implementation of the first prototype. It is by no means the limit of what you should submit as the final project.

Section 6: Work breakdown and schedule

You should think about how to break down the work into components that are appropriate for your project specification (e.g., “create an initial static version of view X”, “link views X and Y to each other”). Also, think about the questions: what are must-have features? What are optional features that can be implemented if there is time?

Include a list of your project milestones. Each should be associated with two numbers: the estimate of the number of hours each work component will take, and the target date for completion of that work. Also, consider how you will split up the work between team members.

Final Report Requirements 10%

Your final report should be a document that fully describes the project. It can be modified from your proposal. Please include the following sections in your report:

1. Overview (1%)
    a. Screenshot of your visualization
    b. Summary of your project briefly
2. Data (1%)
    a. description of your data (e.g., dataset type, scale/cardinality)
    b. Include a URL linking to the source of your data
    c. Briefly describe your current data preprocessing pipeline, if there is one.
3. Goals and tasks (1%)
    a. Description of your intended task(s) in both domain-specific language (based on the usage scenarios) and abstract language (visualization language).
4. Visualization (1%)
    a. Describe the visualization interface that you have built. What views are there and what do they allow users to do? For each view, describe your visual encoding choices and include the rationale for your design choices. How can users interact with your project within each view, and how are views linked?
    b. Include screenshots to support your words
5. Reflection (6%) [Note: if your final submission changes from your proposal, you need to explain why. A poor explanation will lose all points.]
    a. Describe how your project has developed from your initial proposal to your final product
    b. How have your visualization goals changed?
    c. How have your technical goals changed?

Source code 10%

- Include your dataset(s) (1%)
- Consistent with what you have shown in the in-person demo (5%)
- No bugs in the code (4%)

Evaluation 30% (i.e., Demo of the final project and in-person presentation)

The output of your final project will be graded by peer review. You should submit a demo of your work, and it will be uploaded to Github, where other students in the class can review it. Moreover, you should give an in-person presentation to explain your design (i.e., let the audience understand your visualization and know what story you want to tell.).

Your visualization is graded based on the following aspects:

- Task analysis
- Design rationales (the design should match the tasks)
- Expressiveness (channels match data types)
- Effectiveness (channels with higher ranks encode information with higher importance)
- Interaction design (necessity and technique difficulty)
- Novelty

NOTE: This part is graded by peer review. You will rate the other teams' work in the final presentation. The mean rating from your classmates has a weight of 50%, and the mean rating from the instructor(s) takes the rest of 50%.