PROJECT MILESTONE 1: STUDY GOALS AND LITERATURE REVIEW

Instructions

1. Have one member of your team submit a write-up on Canvas by the Canvas deadline.
2. Write-ups must be no longer than 1200 words.

Learning Outcomes

By the end of this milestone, you will be able to,

1. Discuss the goals of a data analysis problem within its larger context.
2. Search for and explain literature on data visualization relevant to a problem domain.
3. Identify key themes from across a broad collection of visualization concepts.

Overall Description

You and your teammates have a choice between two modalities for your course-long projects,

- Design studio: Many experts in data visualization work in design studios (e.g., as independent organizations or within scientific labs / newspapers). In this type of project, you will design an interface to help an imaginary client reach their analysis goals. You will identify a specific dataset and set of questions to study. You will map out relevant visual tasks and then design a suitable interface. If you are involved in a research project on campus, you may use that as a source of design problems.
- Research synthesis: Advances in visual design don't often reach those who are working in specific application domains. In this type of project, you will prepare a report that translates advanced visualization concepts for a data-centric audience working within a specific discipline. Your examples and code should provide concrete guidance for how to use advanced visualization in the typical problems of the discipline.

Examples of published literature belonging to each project modality are given at the end of this document. We do not expect you to write a report at this level in a one-semester introduction to data visualization — view these instead as ideal reports within each project modality. If you have a project proposal which does not fit into either of these categories, you may meet with the teaching team to discuss potential suitability.

You will develop your chosen project over the course of the semester. Please choose a topic in an area that you are genuinely interested[1]! Consider this project an opportunity to develop your team's creative spirit.

Milestone Description

For this initial step, you will choose a project modality, focus in a problem of interest, and survey visualization literature relevant to the task. We expect that by the time you submit your milestone, you have become broadly familiar with prior work in the area and to have read several papers in close detail. In your writing, do not simply list facts — explain key themes and develop your own commentary (e.g., how are proposed methods related to what we have learned in class, what are the main categories of existing approaches, what are the properties of these methods, which visual idioms recur most frequently, how may research concepts be applicable to your data, how do you imagine this area evolving in the future…). Be generous with including diagrams or screenshots to illustrate your main points.

When you structure your report, make sure the following points are clearly visible,

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1. Not just something you think will impress the instructors or your peers…

1. Modality decision: Which project modality did your team decide on?
2. Motivation and goals: For modality 1, you should identify a dataset and explain several tasks you would like your visualizations to support. Describe your hypothetical client and how you will know you have satisfied them. For modality 2, you should describe your chosen data discipline and the types of analysis problems that emerge within it. You should articulate your goals for how your study can help this community.
3. Literature review: Prepare an overview of visualization research literature and / or packages relevant to your chosen problem. Provide a discussion of the main challenges, approaches, and themes.

Rubric

Motivation and goals (9 points): The report demonstrates that its authors have immersed themselves in the problem context and have thoughtfully considered their visualization goals.

Literature review (9 points): The report draws from a variety of complementary resources and connects concepts across them. Commentary demonstrates a deep familiarity with prior work.

Clarity and style (7 points): The writing is compact, well-structured, and free from technical errors. Figures are annotated and citations are formatted consistently.

Literature Examples

Design Studio

1. [Poemage: Visualizing the Sonic Topology of a Poem](#)
2. [Whisper: Tracing the Spatiotemporal Process of Information Diffusion in Real Time](#)
3. [Ocupado: Visualizing Location-Based Counts Over Time Across Buildings](#)
4. [EcoLens: Integration and interactive visualization of ecological datasets](#)
5. [cerebroViz: an R package for anatomical visualization of spatiotemporal brain data](#)
6. [CisGenome Browser: a flexible tool for genomic data visualization](#)
7. [MatrixQCvis: shiny-based interactive data quality exploration for omics data](#)
8. [Visinity: Visual Spatial Neighborhood Analysis for Multiplexed Tissue Imaging Data](#)

Research Synthesis

1. [State of the Art of Sports Data Visualization](#)
2. [Data visualization and health econometrics](#)
3. [Real-Time Analysis and Visualization of Pathogen Sequence Data](#)
4. [Data Visualization in Sociology](#)
5. [Visualizing genomes: techniques and challenges](#)
6. [Principles of high-dimensional data visualization in astronomy](#)
7. [A survey of visual analytics techniques for machine learning](#)