

## CS732/DS732: Data Visualization -- Course Evaluation Guide

Jaya Sreevalsan Nair

International Institute of Information Technology Bangalore

Aug 24, 2023

---

Grading scheme, as announced on August 1, 2023:

- 20% of the final grade for each of 3 assignments (A1, A2, A3)
  - Each of the assignments has a demo for 5%, which may be submitted as a video as per instructions
- 5% for reading-writing assignment (RWA) (or a take-home exam)
- 15% for mid-term
- 15% for end-term
- 5% for class attendance

Submission instructions:

- Programming assignments and RWA: 65% of the final grade
  - It is compulsory to attempt all 3 assignments and the RWA.
  - The assessment of the programming assignment is based on deliverables, i.e. code+report+folder of images+demo for each assignment.
    - The report is where one can elaborate on the data used, hypothesis, analytical methodology, inferences, and responses to any questions posed in the assignment.
    - The code submissions must be source code in text format, say python code in .py text file format, and not as Jupyter notebooks.
    - The video, if included, must indicate how you have been able to demonstrate visualizations, interactions with the application, and other inferences that can be pointed out/highlighted/annotated.
    - For time-varying data visualization, gif images may be generated from frames generated for different time steps. It is important to provide metadata in the plot on the time instance, variable type, etc.
    - It is important to submit a folder of images.
    - A README can be included with instructions on how to run the code, the annotation for images in the folder, and other details related to the execution of your code.

- All submissions must be done on LMS.
  - If your entire submission is larger than the permissible size for LMS submissions, upload your submission on Outlook OneDrive; and submit a document containing the URL to the submission.
  - It is the onus of the student to ensure the correct access permissions are provided in the repository, if the submission files reside outside of LMS, so that there is no difficulty in accessing the files for assessment. In such cases, these repositories have to be accessible until the course grades are announced.
- The scheduling of assignments provides **2-3** weeks to complete each of the programming assignments [A1, A2, A3], and 2-4 weeks for RWA.
  - Assignment announced by Friday midnight IST.
  - All assignment submissions must be done by Monday midnight IST, as per schedule.
  - A3 and A4 is a combined group project with groups of 3 members. The TAs will help with the logistics of team creation, dataset selection for the team, etc.
  - Assignment announcement date and submission deadline:
    - **A1: Aug 25, Sep 18;**
    - **A2: Oct 13, Nov 06;**
    - **A3: Nov 03, Nov 27.**
    - RWA: Sep 29 (paper selection by Oct 06), Oct 30.
- 2 written exams - 30% of the final grade
  - Proctored exams in person during mid-term and end-term weeks.
  - Open notes, only hand-written notes.
- 1 report-writing - 5% of the final grade
  - This can be based on a research paper or a theme. It will be allocated on a first-come-first-serve basis.
    - The topics will be published on October 06, 2023.
    - The choice of topic/paper by the student must be communicated by October 13, 2023. If not received by the deadline, a randomly picked topic/paper by the instructor by October 14, 2022.
    - The report is due on October 30, 2023.
  - If it is based on a research paper, the report must say why the method is important, and its impact on the research community (using the papers that have cited the paper, a state-of-the-art paper that explains the value of the paper), etc.
  - The technical report is to be written in the IEEE conference paper format.

- This also includes references to papers/articles/etc. by citing them appropriately in-place in the report. There will be negative points for not doing citation references within the article and bibliography properly.
  - A more detailed description of how to prepare the report will be posted at the time of the announcement of the papers.
- 

### **A1: Visual Exploration Using Visual Analytics Tools**

Date of announcement: August 25, 2023 (Friday)

Date of submission: 11:59 pm IST, September 18, 2023 (Monday)

Summary: A group project on visual exploration

Dataset: As chosen by the group from the list provided by instructor

A1 tasks and requirements:

1. Read the selected dataset, process the same, and explore the data using visualization and optionally, other simple data analysis techniques, such as statistics.
2. Since it is visual exploration, multiple visualizations should collectively lead to knowledge discovery from the dataset.
  - a. A data story must preferably evolve from multiple visualizations, instead of presenting several visualizations.
3. The assignment implementation must start with a question that can be answered by a list of visualization tasks implemented on the dataset. Visualization tasks include exploration and summary, along with descriptive verbs such as "overview", "trends", "search", etc. (If you are interested more in understanding tasks, please refer to Schulz et al. [1]). Your solution should solve n sets of tasks for an n-member team.
  1. The visualizations may be generated on independent tools or an integrated tool, e.g., Tableau, PowerBI, etc. We recommend the use of Tableau.
  2. You are advised to not split/fragment a task across different team members, as much as possible, and also ensure that all team members have tasks that will enable all in the team to make equal contributions.
  3. You may create tasks based on cohesive subsets of variables in the dataset.
4. The report shall contain a detailed description of the tasks you have tried, and eventually implemented, who did what in the team, etc. Specifically, mention the contributions of each member.

A1 assessment:

1. Assessment is based on the report, images folder, and a video demo of the data stories.
  - a. The report should contain details on dataset description, tasks, visualizations, and inferences/conclusions. The report should have a section on Author

Contributions where the contributions of the team members are explicitly mentioned.

- b. The video demo should be crisp and at most 5 minutes long, where each member explains their task, visualization solutions, and inferences. The first minute can be used by the team leader or the data processing contributor to mention the preprocessing of the data.
- c. The visualizations are expected to be simple plots that are understandable by laymen.
- d. The folder of images must be organized properly, and all images in the folder must be featured in the report. The images in the folder may be named as Fig<number>.jpg/png/<image file extension> where the number is the index of the image in the report. You may add additional images that are not contained in the report, in which case, include a readme file to indicate the significance of such images.

---

#### **References:**

[1] Schulz, H. J., Nocke, T., Heitzler, M., & Schumann, H. (2013). A design space of visualization tasks. *IEEE Transactions on Visualization and Computer Graphics*, 19(12), 2366-2375.