DAS732: Data Visualization -- Course Evaluation Guide

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Grading scheme, as announced on August 1, 2024:

- 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, depending on the course logistics)
- 15% for mid-term
- 15% for end-term
- 5% for class attendance (specifics to be announced during the course)

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 report should have images of the visualizations generated, with a clear explanation of the choice of marks and channels, and your interpretation. The image captions should be sufficiently descriptive.
        - 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 must demonstrate your rationale behind the choice of visualizations and its marks/channels, interactions, and other inferences.
        - For visualizations of time series datasets or the same data with structured changes in parameters, gif images may be generated from the series of frames. It is important to provide metadata in the plot on the time instance, variable type, etc.

[1] Initial version

        - It is important to submit a folder of images as it is difficult to get a full gist of the images from the video or the report.
        - A README is required that gives 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.
        - All assignment submissions must be done by Monday midnight IST, as per schedule.
        - All programming assignments are group projects with groups of 3 members. The TAs will help with the logistics of team creation, dataset selection for the team, etc.
        - Only one member of the team needs to submit on behalf of the team.
            - All team members are welcome to submit their individual contributions over and above the group submission.
            - Please mention in the comments section for each submission as to if it is for the group or individual contribution.
        - Assignment announcement date and submission deadline:
            - **A1: Aug 22, Sep 16;**
                - **Dataset announcement: Aug 23**
                - **Datataset finalization: Aug 25**
            - **A2: Oct 14, Nov 04;**
                - **Dataset announcement: Oct 16**
                - **Dataset finalization: Oct 18**
            - **A3: Nov 04, Dec 25;**
                - **Dataset additions finalization: Nov 06**
            - **RWA: Sep 16, Oct 21;**
                - **Paper announcement: Sep 16**
                - **Paper finalization: Sep 18**

- 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 Sep 16, 2024.
        - The choice of topic/paper by the student must be communicated by Sep 18, 2024. If not received by the deadline, a randomly picked topic/paper by the instructor by Sep 19, 2024.
        - The report is due on Oct 21, 2024.
    - 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 22, 2024 (Thursday)
Date of submission: 11:59 pm IST, September 16, 2024 (Monday)
Summary: A group project on the visual exploration of a sufficiently complex dataset
Dataset: As chosen by the group from the list provided by the instructor and TAs

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. Appropriate Python code or Tableau workbook shall be submitted. For the latter, appropriate access shall be managed for assessment.
    c. 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.

d. The visualizations are expected to be simple plots that are understandable by laymen.
e. 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.

Rubrics for assessment:

- Choice of visualizations - 5 points
- Inferences - 5 points
- Video demo (including use of slides, clarity of presentation, Tableau demo) - 7.5 points
- Report (including good writing and presentation, the inclusion of images, captions, rationale on the choice of visualizations, inferences) - 7.5 points
- Completeness of submission (report, code, images, README) - 5 points

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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.