Department of Computer Science and Media Technology

Linnæus University

Autumn 2025 – SP2

Advanced Information Visualization and Applications
4DV806/4DT912 – Autumn 2025

Assignment 1

Prepare a short report (2–4 pages, A4, 12pt) and two presentations (5–10 minutes videos) with the results of the two tasks described below. Submit a ZIP archive with your report (PDF), the two videos (one for each task), the source code, and all the resources of your implementation, and instructions on how to run it on Moodle by the given deadline.

Questions about the assignments will be addressed during the scheduled tutoring sessions and via the Moodle discussion forum.

Please note: Plagiarism is not acceptable in any way!

Task 1 *Visualize a Data Set*

The first task is to develop a program for visualizing a data set. *Note that you are not allowed to modify the format or the contents of the provided data set; it must be taken as input exactly as it is* (but you are allowed to process the data within your implementation, of course)! You can download the data set from Moodle.

1. First take a look at the data, find out what the data is about and examine its characteristics (variables, structure, etc.). Then, think of a good way to visualize the complete data set to present both the overview of the aggregated data as well as details about particular data items. Finally, implement it.
2. In the report (see below) you should describe the visualization and some example insights you can extract from it. In addition, you should discuss what interaction possibilities would make sense and why, based on the structure of the data set.

You can use any programming language and library of your choice to visualize the data sets (refer to the Introduction lecture). One of the goals of this assignment is for you to investigate and find a library/environment that is comfortable for you and fits your style.

Task 2 *Review a Visualization Tool*

The second task is to write a short review of the visualization tool available at:

`https://projector.tensorflow.org/`

You should try to use the Word2Vec 10K data set with the several dimensionality reduction techniques supported by this tool and investigate the available visual representations and interactions. Write about perspectives such as: (a) the pros and cons of this tool; (b) particular design choices that you would have potentially changed; (c) whether the visual presentation and interaction fit with the constraints of data; (d) what are possible uses and stakeholders; etc.

Do not worry about the technical details of the underlying techniques (t-SNE, UMAP, etc.) as we will discuss them more extensively in a later lecture. For now, give your thoughts and ideas **from the point of view of a user and visualization designer**.

Reading recommendations: the article at `https://distill.pub/2016/misread-tsne/` and the documentation at `https://tensorflow.org/tensorboard/tensorboard_projector_plugin#analysis`.
