Helwan University
Faculty of Computers and Information

Course Syllabus

Department of Computer Science
Data Visualization

Office Hours: See webpage.

Prerequisites: ST121 (Probability I).

Objectives: This course is the topping cream of the previous three courses: Probability and Statistics I, Probability and Statistics II, and Pattern Recognition. After understanding the basics of probability and statistics and the basics of statistical data analysis, here you understand data visually. However, in practice, when you analyze any dataset, the order is reversed. Data visualization allows you getting the feeling of the patterns in the data. Data visualization alerts you to find secrets that are hiding in there and raises flags to what statistical tests you should run or what models you should build. It is the first step before any data analytic formulation or modeling. This course provides you with many techniques that allow you to understand your data before any mathematical treatment. This course is just a very interesting voyage in high dimensions and hyperspace, in which all book chapters will be covered. Please, prepare your baggage, video cam, juice, and say cheese.

Texts: The main text is Chen et al. (2008); however, very nice references to accompany this course are Tufte (1990, 1997, 2001, 2006)

Course Syllabus: All book chapters will be studied in a seminar fashion.

Assignments: Each group of three students will **perfectly** prepare three chapters each time with full lecture notes including all figures. On the lecture day, students will be assigned randomly to topics. So each one in the group has to be prepared for all of the three chapters.

Grading Policy: 60% of the grade will be on the final exam, 30% on preparation and answers to questions in lecture, and 10% on a small project, in which you analyze a real dataset.

General Info:

- All handouts, grades, and assignments will be posted on the course webpage.
- For applications on real data sets, please see the UCI data repository.

References

Chen, C.-h., Härdle, W., Unwin, A., 2008. Handbook of data visualization. Springer handbooks of computational statistics. Springer, Berlin.

Tufte, E. R., 1990. Envisioning Information. Graphics Press, Cheshire, Conn.

Tufte, E. R., 1997. Visual explanations : images and quantities, evidence and narrative. Graphics Press, Cheshire, Conn.

Tufte, E. R., 2001. The visual display of quantitative information, 2nd Edition. Graphics Press, Cheshire, Conn.

Tufte, E. R., 2006. Beautiful evidence. Graphics Press, Cheshire, Conn.