COURSE SYLLABUS

Data Visualization

1819-2-F9201P206

Aims

At the end of the course students will have acquired skills in analysis, development and evaluation of the quality of complex and interactive infographics.

Contents

The course covers the methods, techniques and tools of data visualization and visual design by which to design, implement and evaluate systems that enable the interactive analysis of data and the flexible optimization of reporting (both in an organizational domain and in data journalism). To this aim, in this course strategies will be presented for the visualization of Web data through infographics and dashboards that are both informative and understandable, and that could be implemented without advanced programming skills using various instruments that range from the most common commercial software platforms (e.g., tableau) to the several open source packages accessible on the Web (JavaScript, HTML5, etc.). An important component of the course will cover the iterative design and then the acquisition of methods and techniques to assess the quality of these infographics and their concrete application to the continuous improvement of data visualization systems. In the laboratory hours, the students will also acquire the skills necessary to carry out a concrete application project of realistic complexity, which regards the production of a Web report with graphics and animated and interactive charts on topics of common interest and public utility.

Detailed program

- Introduction to Visualization.
- Human Perception and Information Processing

- Data types

- Graphical perception (the ability of viewers to interpret visual

- (graphical) encodings of information and thereby decode information in graphs):

  a. Signal Detection

  b. Magnitude Estimation

  c. Pre-Attentive Visual Processing

  d. Using Multiple Visual Encodings

  e. Gestalt Grouping

- Color for information display

- Examples and case studies

- Color management systems

- Picture visualization and fruition

- Data Transformation into sources of knowledge through visual representation.

- Requirements and heuristics for high-quality visualizations.

- Charts and standard views: relevance and appropriateness.

- Advanced and innovative tools for data visualization and advanced quantitative analysis.

- The evaluation of the quality of visualizations and infographics.

  o Qualitative assessment: expert and heuristic;

  o Quantitative assessment: user tasks; inferential statistical techniques.

  o Validated psychometric questionnaires and their analysis and understanding.

- Workshops in which students will acquired practical skills to:

  o extract unstructured data from web

  o manage and manipulate data in tabular format (google spreadsheet, excel, etc.)

  o explore and present static data

  o explore and build interactive data visualizations (Tableau Public)

  o design a "data-driven" narrative in a data journalism context.
Prerequisites
None

Teaching form
Lectures with the support of slideware, discussion of practical cases through the forum, discussion of practical home-work projects.

Textbook and teaching resource


Scientific articles and class pack provided by the lecturers.

Semester
First Semester (September - January)

Assessment method
No mid-term assessment. The part of data visualization held by Prof. Cabitza will be evaluated through a group project in which the individual responsibilities for each section will be clear and in which students will be asked to apply methods and techniques learned in class to create and evaluate a complex infographic or a Web report with a series of related infographics. The part of data visualization held by Prof. Schettini will be evaluated through a series of short exercises and papers related to the topics covered in class and that will compose a portfolio. Both activities will be carried out in groups of up to three people and will be illustrated in an oral discussion meeting. The two projects will have independent and complementary evaluations up to a maximum of 15 points each. Additional points (above 30/30) may be associated with small teaching activities or in-depth study of the topics covered in class and to be defined.

Office hours
By appointment