

EIENIV9	Information Visualisation	CM 12h	TD 16h	HNE 22h
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Cours proposé dans la mineure / Course offered in the minor :

AL	CyberSec	IA-ID	IHM	IoT-CPS	Ubinet	IF	M1 EIT DSC	M2 EIT DSC	M2 Fintech
		x	x						

Responsable / In charge of : **Winckler Marco** (Marco.WINCKLER@univ-cotedazur.fr)

Résumé / Abstract :

This class provides a systematic and comprehensive framework for thinking about visualization in terms of principles of interaction with large data sets, perception of visual information, and design choices. We present a large set of visualization techniques that might be used to accommodate diverse types of data structure (including hierarchies, graphs/networks, multivariate table sets, fields, lists and clusters). Students will learn when to choose among diverse information visualization techniques those that can be used to efficiently communicate data (specially when the information is numerous) to the users. Moreover, students will learn how to implement information visualisation techniques.

Prérequis / Prerequisite :

- Programming skills using web technologies (ex. HTML, CSS, SVG, JavaScript) are welcomed.

Objectifs / Objectives :

- The goal is to present information visualization techniques and apply them to solve problems related to the interaction with large datasets. This course includes methods for processing data and analysing data sets. The class also presents visualization techniques and brings students to create information visualization techniques to display data.
- Students are expected to apply the tools and methods in a practical project that should implement a set of information visualization techniques to help users to accomplish their task with large data sets.

Contenu / Contents :

- Principles of information visualization
- Data structures used to visualize data
- Techniques for processing data sets
- Data transformation along the visualization pipeline
- User perception and the impact on information visualization
- User tasks and techniques for interacting with data
- Overview of information visualization techniques (ex. graphs, hierarchies, multidimensional data, ...)
- Programming of information visualization techniques
- Introduction to the library D3.JS

Références / References :

- Tamara Munzner. Visualization Analysis and Design. AK Peters Visualization Series, CRC Press (2014).
- Colin Ware. Information Visualization, Third Edition: Perception for Design (Interactive Technologies). Morgan Kaufmann. 536 pages (2012)
- Scott Murray. Interactive Data Visualization for the Web. O'Reilly Media. 273 pages (2013)
- Robert Spence. Information Visualization: An Introduction. Springer (2014)

Acquis / Knowledge :

- Apply a classification of data types structures for visualisation
- Make connections among data types and information visualization techniques
- Identify information visualisation techniques that help users to perform appropriate tasks
- Ask relevant, detailed, and probing questions about data structures and visualization techniques
- Recognize the different data mappings necessary in visualization pipeline
- Express aesthetic appreciation and insight about visual representation of data
- Solicit feedback, evaluate, and revise information visualisation techniques according to user needs.
- Understand the principles of information visualization

- Know the Schneiderman's mantra of information visualization
- Know the main information visualization techniques
- Know the tools for dealing with information visualization
- Know the data structures used to visualize data
- Implement a pipeline for information visualization
- Interact and use different information visualization techniques
- Be able to reuse information visualization techniques available
- Be able to program basic information visualization techniques

Evaluation / Assessment :

Project (50%) plus written examination (50%)