

Learning outcomes

The aim of this course is to propose complex visualization methods based on the combination of different technologies that have been developed in the different modules of this semester. It introduces techniques dedicated for data visualization, complex algorithms integration (image processing, deep learning inference, etc.) and real-time communication. The whole being implemented as part of Web applications integrating these technologies.

Content

- Data Visualization
 - o Data visualization basics
 - o Introduction to D3.js (<https://d3js.org/>)
 - o Design and visualization
- Complex algorithms and external libraries integration:
 - o C/C++ implementation with WebAssembly
 - o OpenCV integration
 - o TensorFlow integration
- Real-Time Communications:
 - o WebRTC integration
- Case of studies:
 - o Image/video processing in 3D environments
 - o Spectral computation and visualization in 3D environments

Modes of study

Course and project work, active participation and a 5 days development sprint.

Teaching methods

- Lectures: 15 hours
- Practical work (during the lectures): 30 hours
- 5 days development sprint

Study materials

- The Visual Display of Quantitative Information - Edward Tufte - 1983
- Information Visualization: Perception for Design: Second Edition - Colin Ware - 2004
- A Tour Through the Visualization Zoo - Vadim Ogievetsky, Jeffrey Heer, Mike Bostock - 2010
- D3.js - Data-Driven Documents - <https://d3js.org/>

Evaluation criteria

(Written exam / written assignments / project work / ...)

1 theoretical examination (1h30, 1/2), 1/2 project (5 days sprint included)

Scale to be defined

Prerequisites

- Real time 3D visualization
- Real time processing of conventional and non-conventional images with GPUs