

Course Specification Document

Title	Data visualization
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Credits	2.5 ECTS
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Aims	The course aims to teach the student techniques for creating appropriate visualization methods based on the principles of graphic design, cognitive psychology and motor neuroscience.
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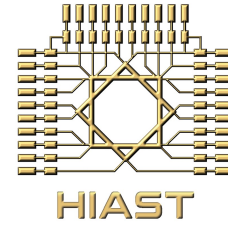
Intended learning outcomes

On successful completion of this course, the student will be able to:

- Understand key visualization techniques and theories, including data models, graphical perception and methods for visual encoding and interaction.
- Recognize a number of common data domains and the corresponding analysis tasks, including multivariate data, geo-spatial data, and networks.
- Acquire hands-on experience in constructing and assessing visualization systems.
- Read and discuss research papers from the visualization literature.
- Compare different methods used for visually representing data and interacting with it and understand how these different methods can lead users to different conclusions.
- Formulate effective visual data presentations to explore a specific intended analysis task.
- Select the appropriate visualization methods for various data types, such as multivariate tables, trees, networks and geographic/spatial data.
- Visualize data using static and interactive methods using Tableau.

Syllabus

- **The value of data visualization:** What is data visualization and why do we do it.
- **Data and visual models:** Understanding how data is represented through images and visual models.
- **Exploratory data analysis:** Explore techniques for better data exploration and analysis.
- **Visual representation:** Studying how data is represented through visual elements such as colors and sizes to achieve rapid understanding.
- **Interaction:** Exploring how users interact with visualized data.
- **Maps:** Analyzing how maps are used to represent geographic data.
- **Narrative:** The art of turning data into stories for better understanding.



- **Uncertainty:** Dealing with data uncertainty and how to visually represent it.
- **Color:** Understanding the impact of colors and using them effectively in visual representation.
- **Networks:** Data visualization techniques for network data.
- **Data visualization tools:** Reviewing tools and software used for data visualization to achieve specific goals.
- **Scalable visualization:** Understanding how to create visual representation that can adapt to variable levels of data.