(Information) Visualization

CSC 511

Instructor: Melanie Tory
First, a bit about me...
Human-computer interaction
Psychology
Computer Graphics
Domain knowledge

Data
Visualization is...

Use of computer supported, interactive, graphic representations of data to support human activities
Scientific Visualization (SciVis):
• Spatial layout is given by the data (e.g. MRI & CT images, fluid flow)

Information Visualization (InfoVis):
• Spatial layout is chosen by the designer (e.g. cancer rate statistics, social networks)
Course Objectives

By the end of the course, you will be able to…

• Design visualization techniques to support human activities, using a user-centered process
• Describe visualization design guidelines, and explain the guidelines in terms of human perception and cognition
• Critically evaluate visualization techniques, tools, and research papers
• Describe major sub-disciplines within the field of visualization.
Course Components

Human Abilities
- Visual perception
- Cognition
- Motor skills

Design Principles
- Visual display
- Interaction

Design Process
- Iterative design with users
- Design studies
- Evaluation

Frameworks
- Data types
- Tasks

Techniques
- Specific visualization techniques (e.g. focus + context, parallel coordinates, pixel-oriented techniques, linked views)

Imply
Inform design
Course Components

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Inform design

Imply
Overview + Detail

From the MATLAB Signal Browser
Perception
Colour
Depth & Occlusion
Space and Order
Interaction
Course Components

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Visualization Frameworks

- Visualization Technique Classifications
- Data Types & Tasks
- Mapping Data to Techniques

![Diagram](image-url)
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Human Abilities → Design Principles
Design Principles → Design Process
Frameworks → Inform design
Techniques → Inform design

Imply
Inform design
High Dimensionality
Trees & Graphs
Vectors and 3D Volumes (very briefly)
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Design Studies
Evaluation

![Bar chart showing ratings for comprehensibility, ease of use, speed of use, and overall. The ratings are on a scale from 1 to 9.](image)
Assignment 1

• Due next Monday (Jan 11), 1 hour before class

• Present it as a publicly available webpage
• Find one “good” visualization and one “bad” visualization
  – Use any published, original source, EXCEPT visualization books, papers, or websites
  – Any application domain
• For each picture, write 2 paragraphs:
  – 1 – the story behind the picture (what does it show?)
  – 2 – explain why it is good or bad. Be specific. Include any design criteria you think are important
Reading for next class

• Ware – Chap. 1
• Tufte – Chap. 1