TECHNISCHE UNIVERSITÄT DRESDEN

Computergraphik und Visualisierung

INTERACTIVE MEDIA LAB DRESDEN

Faculty of Computer Science
Institute of Software and Multimedia Technology

0

Data Visualization

Organization

Prof. Dr. Stefan Gumhold
Prof. Dr. Raimund Dachselt

Introduction
Lecture Outline

Your lecturers

Organizational Issues

Content

- History
- Foundations
- Examples
- Data
- Summary and Outlook

Who are we?

Prof. Dr. Raimund Dachselt

Chair of Multimedia Technology /
Head of Interactive Media Lab Dresden

Faculty of Computer Science

Research Areas

Natural Human Computer Interaction

- Multimodal Interaction
- Interactive Surfaces
- Multi-Display Environments

Information Visualization

- Interactive Graph Visualization
- Mobile Data Visualization
- Immersive Data Analysis

Prof. Dr. Stefan Gumhold

Chair for Computer Graphics and Visualization

Faculty of Computer Science

Research Areas

Geometry Processing

- Point Cloud and Mesh Processing
- Analysis of curves and surfaces

3D Scene Understanding

- 3D acquisition
- Traffic video analysis

Scientific Visualization

- Particle & Trajectory Visualization
- Real-time Rendering for Visualization

Organization

OPAL:

- All communication
- Learning materials (slides, notes, etc.)
- Use forum!

Consultations

- Q&A sessions on request!

Examination

- Written exam – no bonus points!

https://imld.de/en/study/teaching/ws_24-25/vis_24-25/

Outlook

Course Content

Motivation & Introduction

Perception

Visual Attributes

Attribute Visualization

Multivariate Data Visualization

Presentation and Interaction

Graph Visualization

Time Visualization

Introduction to Scientific Visualization

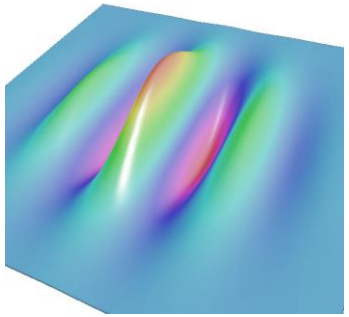
Data Preparation

Volume Visualization

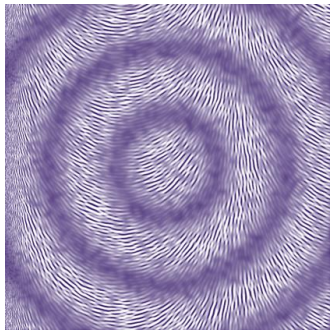
Flow Visualization

Summary Outlook

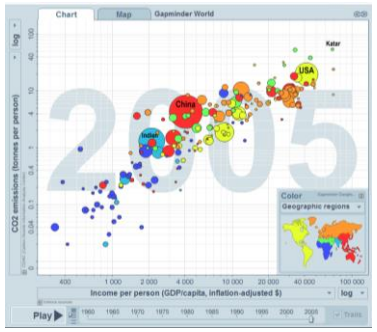
Perception



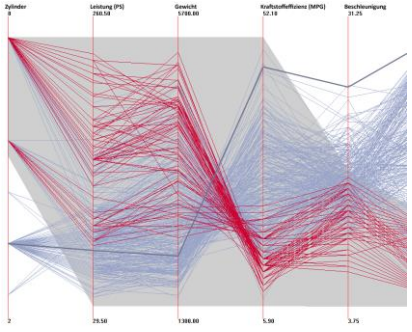
Mapping to Color



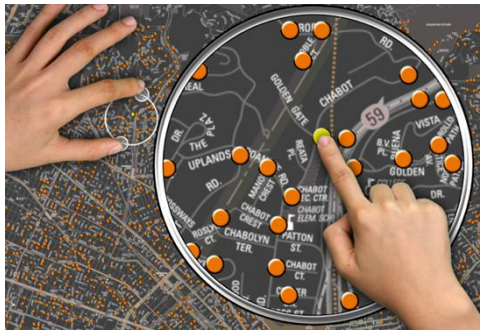
Mapping to Texture



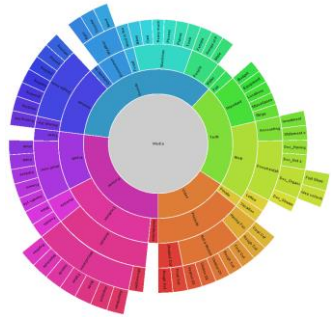
Multivariate Scatterplot



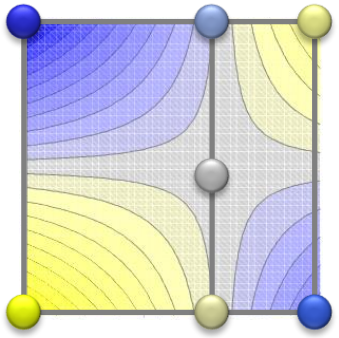
Parallel Coordinates



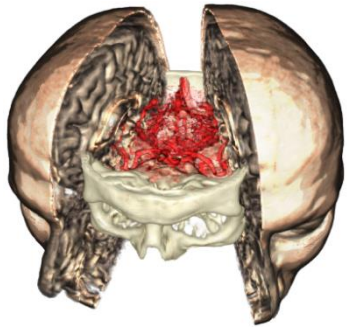
Interactive Lenses



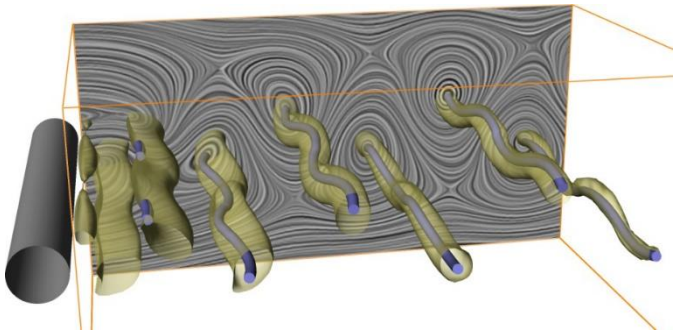
Graph Vis Example



Interpolation



Volume Vis Example



Flow Vis Example

What else do we teach?

Winter Semester

User Interface Engineering

- Development process of user interfaces
- Interaction design, prototyping, evaluation

Interactive Multimedia Information Retrieval

- Semantic Web technologies
- Information Retrieval models and methods

Summer Semester

Interactive Information Visualization

- Advanced InfoVis solutions
- Focus on Natural User Interfaces for InfoVis

Advanced User Interfaces

- Multimodal Interaction
- Gestures, Multitouch, Pen, Tangibles, Gaze

Winter Semester

Computer Graphics 1

- Realtime Rendering, Polygonal Meshes
- Data Structures, Optimization

Computer Graphics 3 (physics based graphics)

- Global Illumination
- Physically Based Animation (rigid bodies, fluids)

Summer Semester

Computer Graphics 2

- 3D Scanning and Scan Processing
- Character Animation

Scientific Visualization

- Stereo, Particles, Volumes, Terrains, Topology

Literature

Conferences:

- IEEE Visualization (USA+) [vis.computer.org]
- EuroVis (EG/IEEE VGTC Symposium on Visualization)
- PacificVis (IEEE Pacific Visualization Symposium)
- ACM CHI (Human Factors in Computing Systems)

Journals:

- IEEE Transactions on Visualization and Computer Graphics
- Computer Graphics Forum
- IEEE Computer Graphics & Applications
- ACM Transactions on Graphics
- The Visual Computer (Springer)
- Computers & Graphics (Pergamon)
- Information Visualization

Your Questions