

(Pro-)Seminars:

- Advances in Scientific Visualization**
- Visual Computing**

Introduction

May 3, 2018

Filip Sadlo



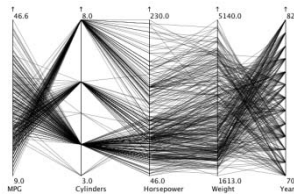
UNIVERSITÄT
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Visualization

- Research on graphics-related data analysis techniques
 - “Extract the essential structure of data”
 - Make use of (massively parallel) human visual system
 - Inherently multidisciplinary
- Central discipline in data science?

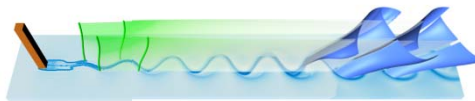
Information Visualization



Emphasis on structure

- Discrete data
- High dimensions

Scientific Visualization

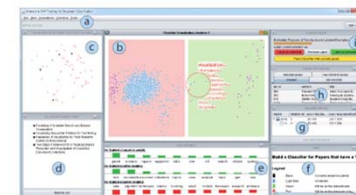


Emphasis on phenomena

- Continuous data (spatial)
- Low dimensions

Computer Graphics

Visual Analytics



Emphasis on interaction

- Discrete/continuous data
- Low/high dimensions

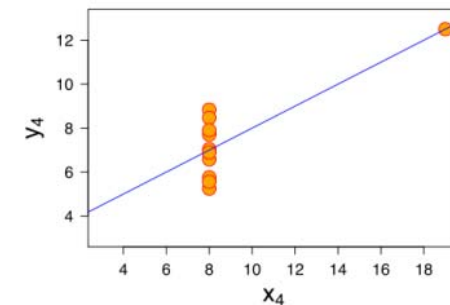
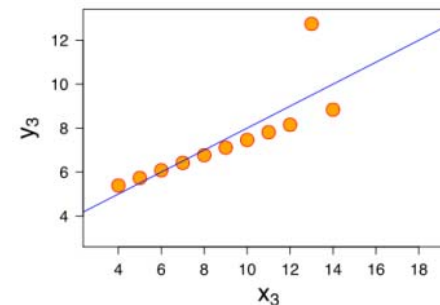
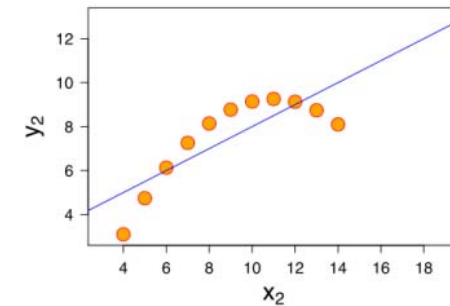
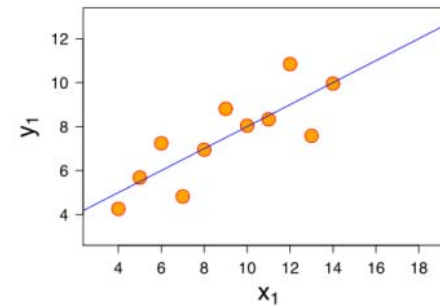
The purpose of computing (and measurement) is insight, not numbers.
– *Richard Hamming, 1962*

Anscombe's Quartet

- Four datasets (I–IV):

I		II		III		IV	
x	y	x	y	x	y	x	y
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89

→ Plotting

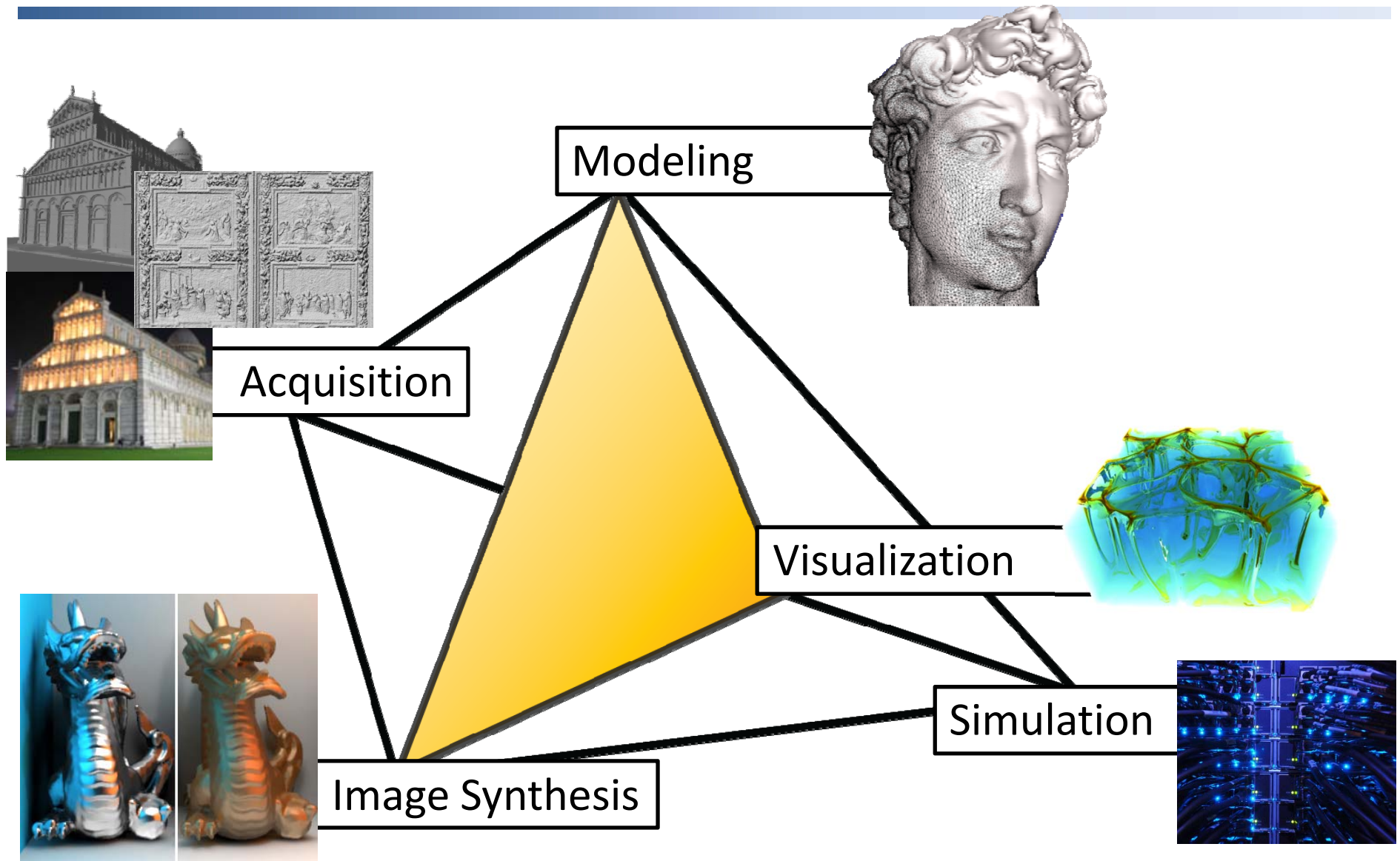


[Wikipedia]

- Same (or very similar):
 - Mean and variance (x and y)
 - Correlation, linear regression

- Tables, charts, summary figures etc. may be related to statistics
- But visual data analysis = visualization!

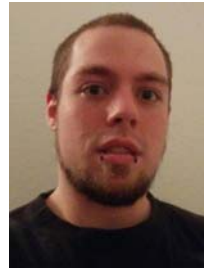
Computer Graphics / Visual Computing



People



Filip Sadlo



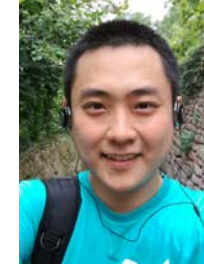
Karsten Hanser



Lutz Hofmann



Kai Sdeo



Boyan Zheng

General Information

- Two (Pro-)Seminars:
 - Advances in Scientific Visualization
(https://vcg.iwr.uni-heidelberg.de/teaching/2018/sem_scivis/)
 - Visual Computing
(https://vcg.iwr.uni-heidelberg.de/teaching/2018/sem_viscomp/)
- Goals of these seminars
 - Study of a topic from current research
 - Research of material
 - Initial material is provided (1 publication, presented today)
 - Proseminar: only secondary literature has to be researched
 - Seminar: 1 additional (fitting) publication, plus secondary literature
 - Presentation and discussion of the topics during a block seminar (presumably three dates per seminar)
 - Written report

Schedule

- Preliminary discussion (May 3, 2018 – today)
 - Goals and prerequisites
 - Presentation of topics
- To do
 - Register for one (or both) seminars within Moodle, until Monday, May 7
 - This registration enables you to vote for the topics presented today
 - Follow instructions that will be sent within Moodle regarding voting etc.
- Notification of assignment of topics
 - May 21, 2018
- Presentation (block seminar, after lecture time, in English)
 - Dates will be decided from survey
 - Proseminar: 15–20 minutes; Seminar: 25–30 minutes; + 5–10 discussion

Schedule

- Each participant is directly advised by a PhD student from the Visual Computing Group
- Attend our Hauptseminar “Computergraphik und Visualisierung” (Monday, 16:15–17:45, SR 10) for examples on how to give a presentation
 - In particular **May 18 (Friday)**, held by Lutz Hofmann
- 6 weeks before the seminar:
 - Hand in outline/draft
- 4 weeks before the seminar:
 - Hand in draft, structure checked by F. Sadlo
- 2 weeks before the seminar:
 - Hand in version for final feedback by F. Sadlo
- 2 days before the seminar:
 - Hand in final version of fast-forward slides
 - 1–2 slides that describe your project (details and template via Moodle)

Schedule

- Written report (details and deadline will be announced)
 - Proseminar: 10–15 pages (presumably, depending on the template, including figures, final page limit will be announced)
 - Seminar: 15–20 pages (presumably, depending on the template, including figures, final page limit will be announced)
 - Date: after lecture period (or even during next lecture period)
- Grade
 - 40% presentation
 - 60% written report

Questions?