WS 2017/2018

Scientific Working

'Wissenschaftliches Arbeiten'

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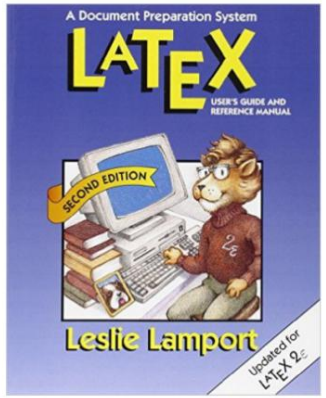
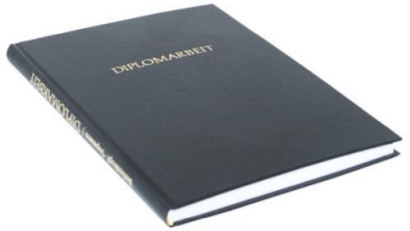
Outline



1. Organization
2. Talks/Presentations
3. Latex Basics
4. Poster
5. Writing Thesis/Papers



Starting Point

- thesis to be written: master thesis / phd thesis
- accompanying publication (paper)
- more general: working on a research project
- talks/posters/writing research reports: recurrent

WHAT'S NEXT?????

Outline

1. **Organization**
2. Talks/Presentations
3. Latex Basics
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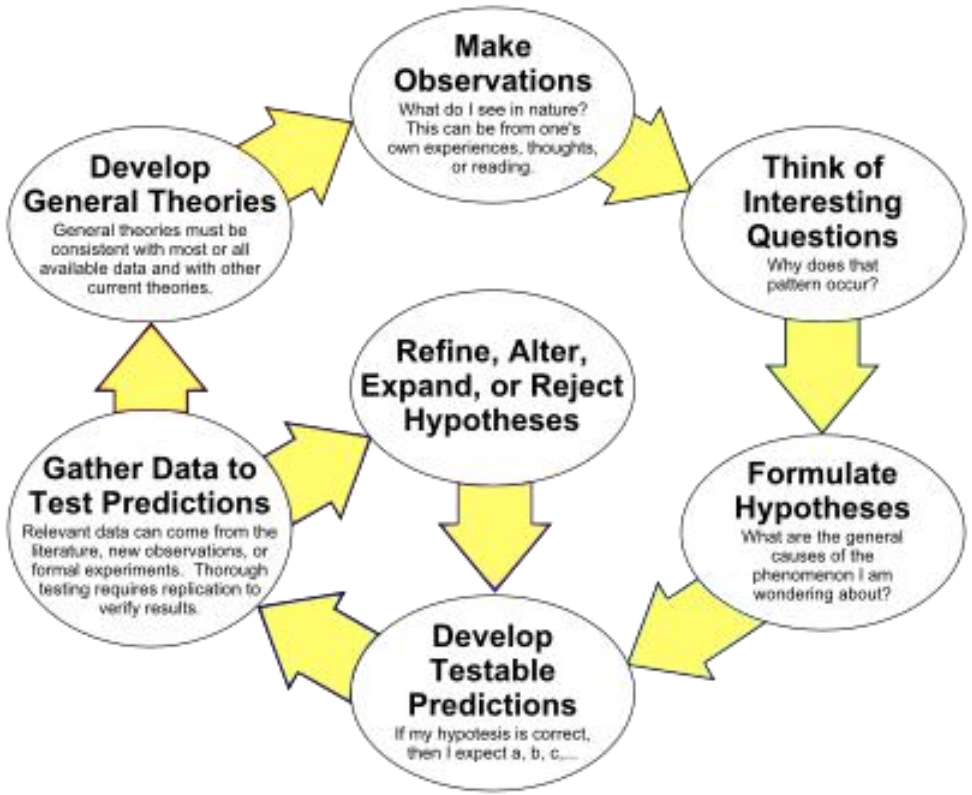
The Scientific Method as an Ongoing Process



Organization of Research

- formulation of a research question
- coordination/agreement with supervisors
- time schedule
- literature search
  $\rightsquigarrow$ do similar approaches exist (novelty, contribution) ?
- working on the project
  (theoretical considerations, experiments, applications)

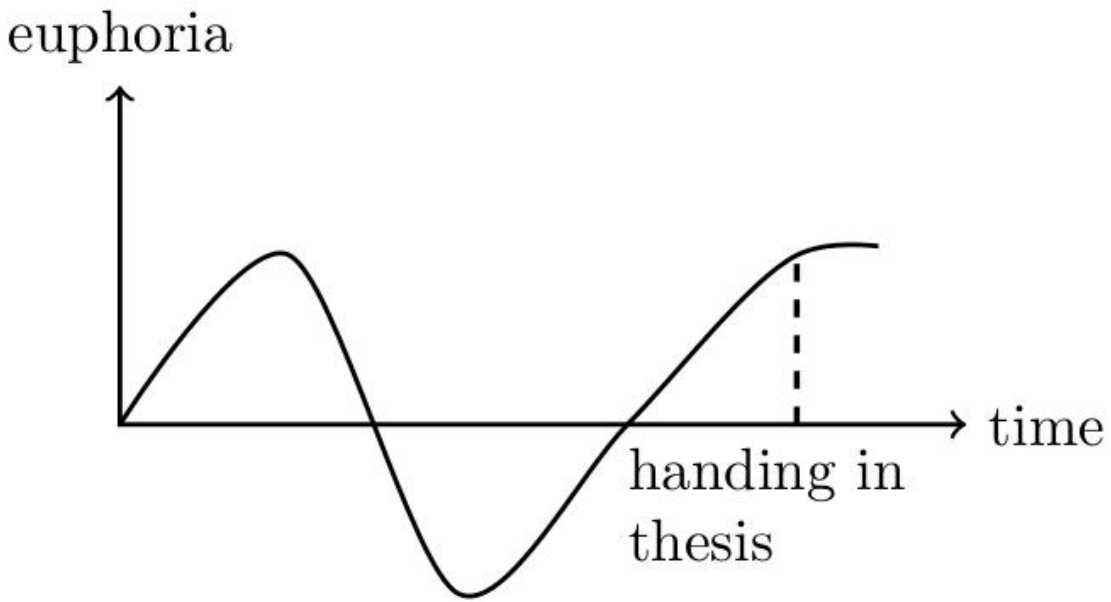
(These points might change several times...)

Organization of Research

Re-occuring tasks

- documentation (lab journal), handwritten notes (scan for archive)
- backup your data (SVN/backup service by our institute/external hard disk)
- feedback: discussions / seminar talks
- parallel: write down chapters/sections (a soon as possible)

Curve of Happiness (Frustration?)



Research question

Meeting with supervisor

Time schedule, milestones

Literature search

Structuring information

Working on the project

What do I want to proof?

What is/are my aim(s)?

What is my contribution to academic discussion?

What is the current state of research?

Order is not successive but parallel and can change!

AIM

- Formulate research question
- Ideas about content
- Write down topics, which should be covered in the thesis/ possible outline of thesis

> MEET with supervisor!

Research question

Meeting with supervisor

Time schedule, **milestones**

Literature search (| revise research question?)

Structuring information | outline with major points

Working on the project

Formulate **milestones**!

- Short term goals (weekly?)
- Long term goals (monthly and per year)

Create a **time schedule**

- Notes on literature research, writing
- Events
- Deadlines!

Literature Search

- google scholar https://scholar.google.de/
  - search for newest publications
  - forward/backward search in references
  - look at authors' websites (code?), versions
- DBLP computer science bibliography http://dblp.uni-trier.de/
- arXiv http://arxiv.org/
- UB Heidelberg http://www.ub.uni-heidelberg.de/
- access to papers, interlending ('Fernleihe'), kindly ask authors (include background)
- Research gate https://www.researchgate.net/home

Research question

Meeting with supervisor

Time schedule, milestones

Literature search

Structuring information

Working on the project

- Structure information
- Have I done enough research?
- Create outline (based on own ideas and topics covered in literature)
- Write down statements by authors, which should be discussed!

- Start to work!

Outline

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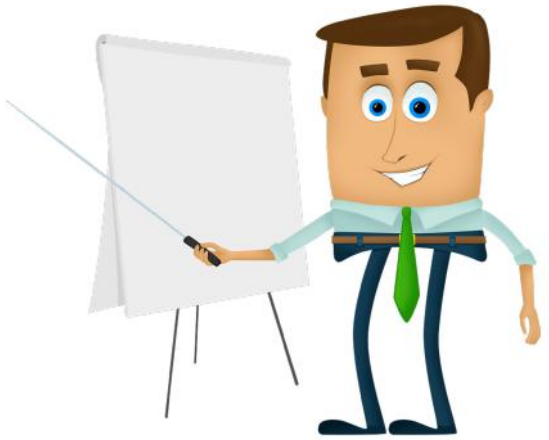
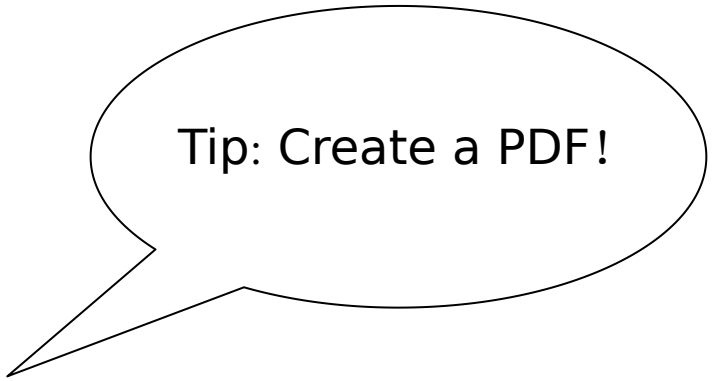


Presentation



Basics about the organization:

- tools: powerpoint/openoffice/libreoffice/beamertex
- (black/white board talks $\rightsquigarrow$ very seldom, needs time)
- language: you might use English text even for talks in german
- audience: balance between reaching everybody and conveying expert level
- British or American English ?

Presentation

How to structure your presentation?!

Structure of overall **presentation**

Structure of individual **slides**

Questions by audience: prepare foreseeable/obvious questions

- What is the run time of your code?
- Have you compared your results to….?
- Why did you choose this approach/method?

Structure of overall presentation

1. Title page
2. Contents page
3. Sections
4. Summary, conclusion
5. Future work
6. (Literature)
7. Last slide (informative, possible email address, links to websites)

Organization of one slide

- clear structure/grouping
- Are all terms defined (in text or by oral explanation) ?
- print page numbers for questions (rehearsal talk: corrections)!

focus on a few basics facts/ important issues:

- do not overload slides ! $\rightsquigarrow$ distribute over multiple slides
- not too much text ! Do not formulate (long) sentences, paragraphs !
- do not use to much/too long formulas !
- do not show extensive lines of code !

The Faust Legend in European Thought

The Faust legend first flourished in medieval Europe and is thought to have its earliest roots in the New Testament story of the magician Simon Magus (Acts 8:9-24). During the superstitious Middle Ages, the story of the man who sold his soul to the devil to procure supernatural powers captured the popular imagination and spread rapidly. At some point the name of Faust was definitely attached to this figure. A cycle of legends, including some from ancient and medieval sources that were originally told about other magicians, began to collect around him. One of the most widely-read magic texts of the period was attributed to Faust and many others referred to him as an authority.

A famous German sage and adventurer born in 1480 was thought by many of his contemporaries to be a magician and probably did practice some sort of black magic. Few details of his life are certain, but it is known that he capitalized on the situation by calling himself "Faust the Younger," thus acquiring the occult reputation of the legendary character.

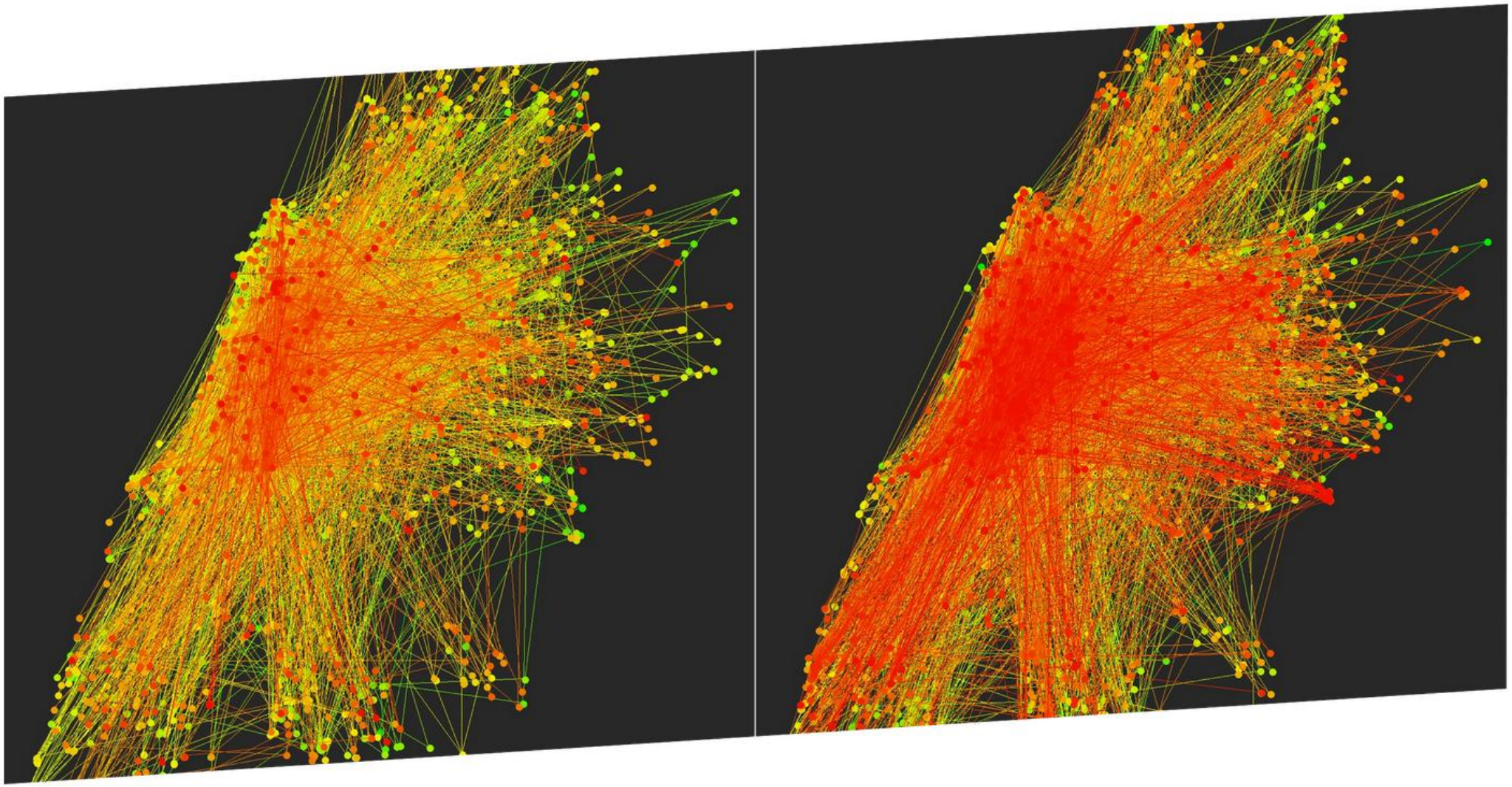
Presentation

critical points:

- extensive text Example
- reading long text passages
- color/contrast Example
- overlays Example
- illustrations/charts Example
- page numbers (maximal number, do you want to show the total number)
- references Example

Psychology:

- we read from left to right – we expect the most recent results on the right
- red color – red means 'alarm' = negative property (performance graph of own work should not be in red.)



Source: *Manovich, The Science of Culture (*2015)
http://manovich.net/index.php/projects/cultural/ analytics/ social/ computing

An Example for too much Text...

In mathematics, and more specifically in graph theory, a graph is a representation of a set of objects where some pairs of objects are connected by links. The interconnected objects are represented by mathematical abstractions called vertices (also called nodes or points), and the links that connect some pairs of vertices are called edges (also called arcs or lines). Typically, a graph is depicted in diagrammatic form as a set of dots for the vertices, joined by lines or curves for the edges. Graphs are one of the objects of study in discrete mathematics.

[source: Wikipedia]

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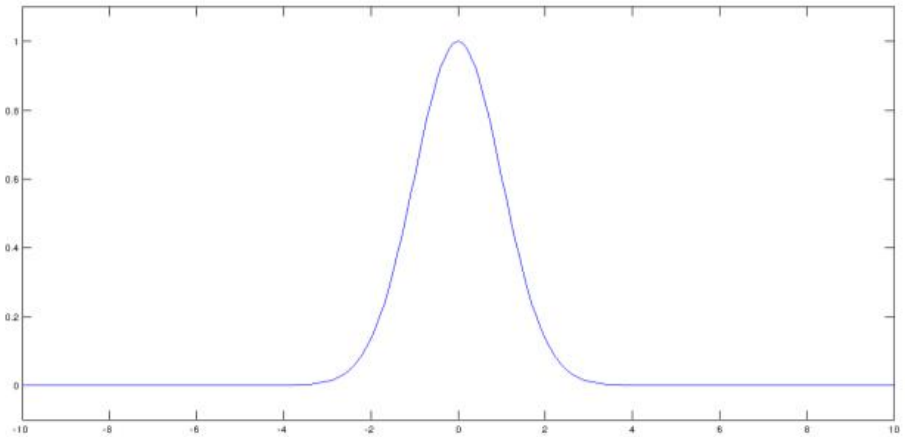
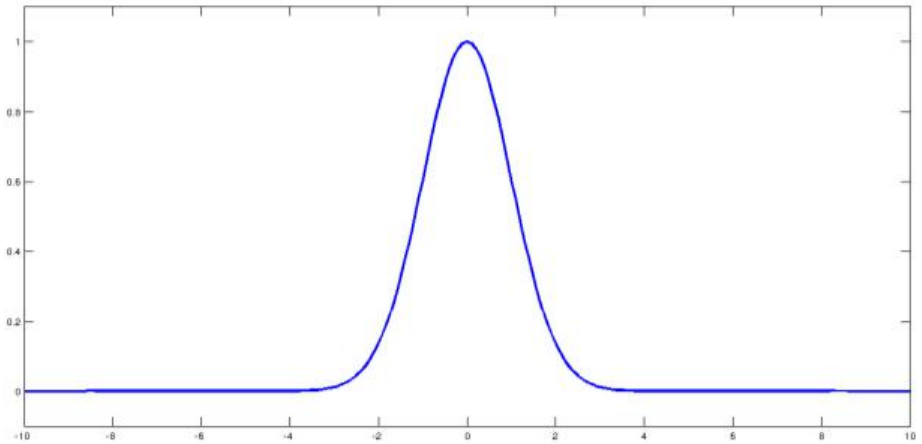
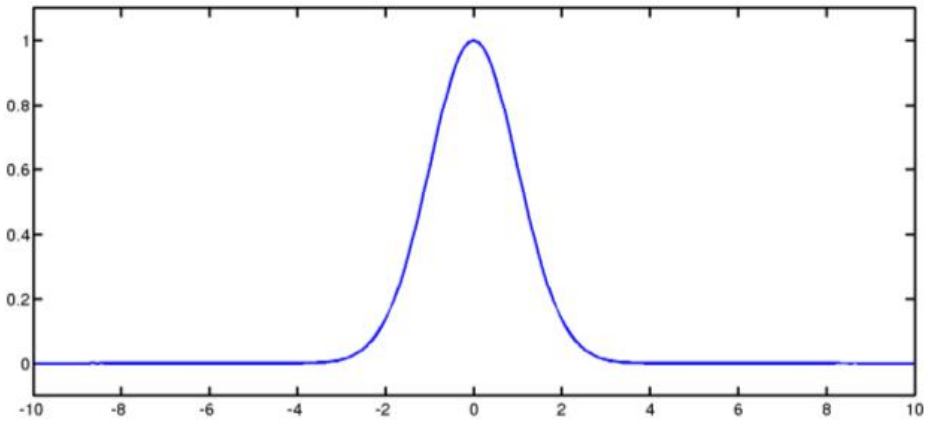
Example Illustrations/Charts







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Presentation

Talk

Preparation

- along with slide preparation formulate text $\rightsquigarrow$ separate notes, cue cards
- rehearsal talk (for yourself, with friend/colleagues listening, in internal seminar)
- prepare a backup file (pdf) (USB stick, email, homepage, dropbox)
- on site: test equipment (our/provided notebook, beamer, laser pointer, presenter, movies)

- where to stand / how to stand
- personal attitude transfers to the audience
- look towards audience (from time to time)
- use pointer
- to not jump (extremely) back and forth over several slides
- helpful tool: presenter

What makes a great speaker?

7 Secrets of Great Speakers

https://www.youtube.com/watch?v=i0a61wFaF8A

1. words
2. Voice tone
3. Body Language (all three mean great communication)
4. Do not present too much data

   > What is the one thing that you want to leave people with?
5. Have a conversation with people (not presentation to/speech to)

   > dialogue; no performance
6. Adress different senses
7. Authentic passion

Richard Greene, *The 7 Secrets of the Greatest Speakers in History*

November 4, 2014

TED Talk