

Seminar: Novel Medical Imaging Methods

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<http://campar.in.tum.de/Chair/TeachingSs11NMIMSeminar>

Goals of the Seminar

Learn how to:

- **Read** scientific papers.
- Do the **state of the art** on a specific topic.
- Write a scientific **report**.
- Do a scientific **presentation**.

The Seminar in Practice...

- **SWS:** 2+0, **ECTS:** 4 credits.
- **Course Language:** English
- 2-4 presentations per session

- **Presentation:** ~30 min presentation, ~15 min questions
 - download the PPT template from the seminar webpage

- Write a **report** (max. 8 pages)
 - download the template from the seminar webpage

- **Attendance** and participation of the seminar meetings
 - Participation: read the abstract, see figures, read introduction and conclusions.
 - **Prepare questions.**

The Seminar in Practice...

1. Prepare

- read, read and read...
- prepare the **presentation** and **report**

2. Two weeks before

- fix a meeting (send a mail to your supervisor)

3. One week before

- discuss the report and presentation with your supervisor

4. Presentation

- questions, exchange of ideas, feedback

5. One week after

- send the final report

Contents of the Presentation

Rule of thumb: max 1 slide per minute (max. 30 slides for 30 minutes)

- **Present the Paper**
 - type and year of publication: journal, conference, workshop, etc.
 - authors, institution
- **Motivation and Goal**
 - What is the problem that the authors try to solve?
 - Name potential applications: what for?
 - General motivation: why is it interesting?
- **Related Work (state of the art)**
 - Mention most similar approaches and explain how your paper is different from them?
 - Citing/Referencing other people's work [Lastname-Publication-Year], e.g. [Lasser-TMI-2008]
- **Method**
 - Overview: input, output, contribution (the proposed new elements)
 - Method/Algorithm (only key ideas)
- **Results (short version)**
 - Explain the type of data used.
 - Validation: what is being validated and how.
- **Conclusion (include your own conclusions!)**

Related Work: Access to Scientific Publications

- Access to most publications is not free.
- Many publications can be accessed for free using eAccess or the TUM proxy
- Some places to look for publications:
 - **Google Scholar:** <http://scholar.google.com>
 - **PubMed:** <http://www.ncbi.nlm.nih.gov/pubmed>
 - **Our library:** <http://www.biblio.tu-muenchen.de/ejournals>
 - eAccess via myTUM ID
 - access via proxy from the TUM internal network

Contents of the Report (max. 8 pages)

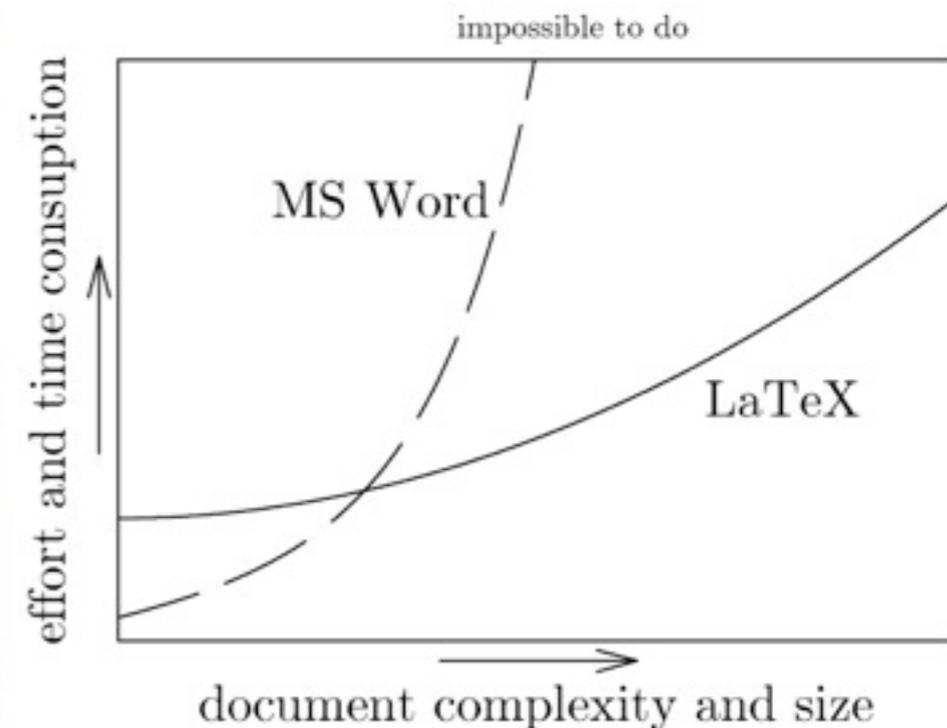
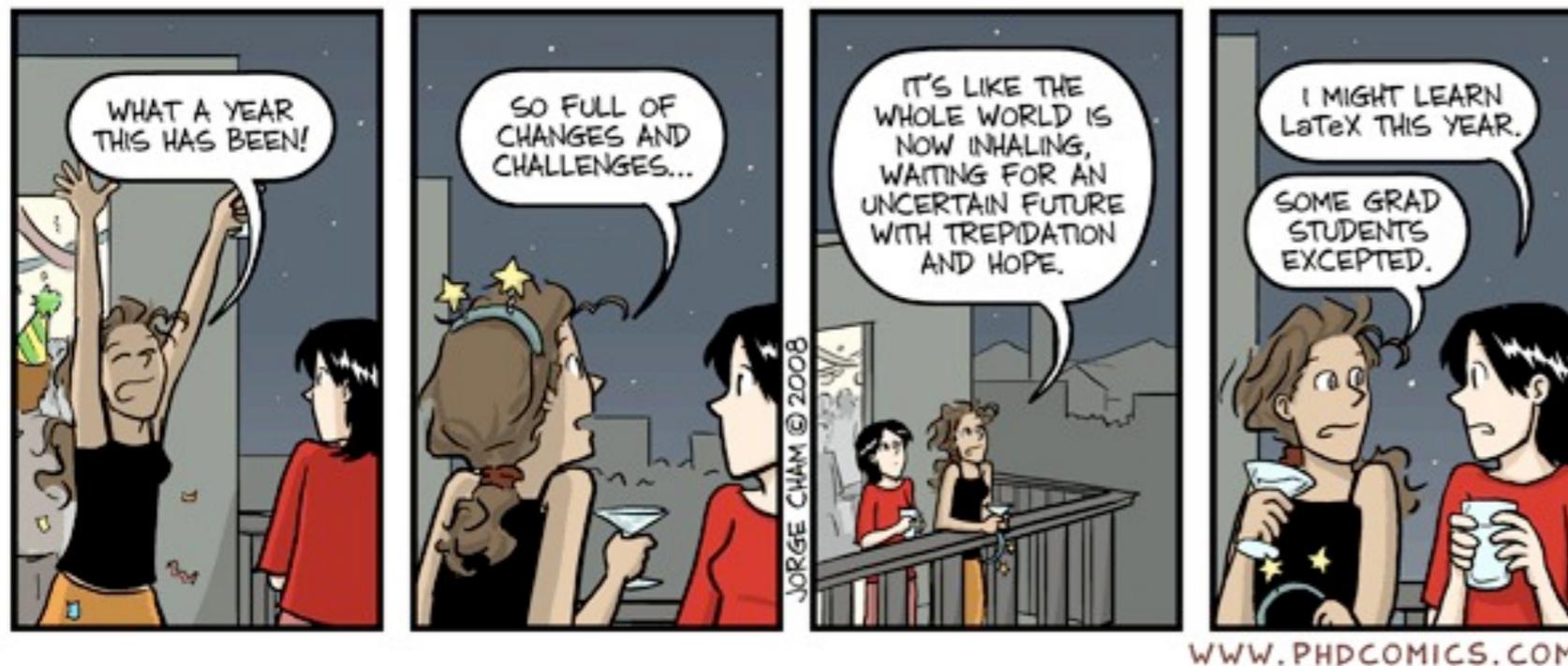
- **Abstract and Introduction (~1 page)**
 - general motivation
- **State of the Art and Contributions (~2 pages)**
 - Look for related papers, books, websites, materials etc., e.g. papers citing the studied work.
 - How is this paper different from SoA? What is new, better, faster?
- **Problem statement (~1 page)**
 - Mathematical formulation
- **Method (~2 pages)**
 - Overview: input, output.
 - Method/Algorithm
- **Results (~1 page)**
 - Summary of experiments and results (what type of data and validation).
 - **YOUR CRITIQUE** of the methodology, setup and validation (what else could have been done? is it enough to demonstrate the contribution? is the data biased? are there any not-mentioned assumptions? can it be easily reproduced?)
- **Conclusion (~1 page)**
 - **YOUR PERSONAL CONCLUSION & IDEAS**
- **References (~1 page)**

Instructions for the Report

- **Do NOT copy and paste!**
- Use the LaTeX template from the seminar website

LaTeX

- Typesetting System for Documents
- Most widely used by mathematicians, scientists, engineers and other scholars in academia and the commercial world
- Available for free on many platforms (Windows, Linux, Mac, ...)
- LaTeX distributions: MikTeX (Windows), TeX Live (Linux), MacTeX (Mac)
- Example editors: TeXnicCenter (Windows), vim (Linux), TeXShop (Mac)



Evaluation Criteria

- **Presentation (50%)**
 - **Understanding (prepare in advance!)**
 - Quality of slides/material
 - Clarity of motivation
 - Clarity of method overview
 - Appropriate use of formulas
 - Personal conclusion
- **Report (50%)**
 - Use of **OWN** words
 - Presentation, language and structure
 - **State of the art**
 - Personal conclusion

Finally...

- Seminar groups are usually heterogeneous. So it is normal if you do not understand the details of each presentation.
- **DO ASK questions** about what is not clear. This will not penalize the presenter, they will give you **participation points** and everybody might learn something from it.
- To get detailed **feedback** after your presentation, come to our office.
- The **duration** of the presentation will be **strictly controlled**. We will ask you to jump to your conclusions if the indicated duration is exceeded.

List of talks

- Introduction to Tomography (Tobias Lasser) - May 23
- X-ray Imaging Methods
 - Ptychography (Vladimir Golkov) - May 23
 - Differential Phase-Contrast Imaging (Fabian Petter) - May 23
 - Interlaced DPC (Ho Pei-Yi Heidi) - Jun 3
 - Clinical DPC (Niko Mäkelä) - Jun 3
 - Dark-field Imaging (Marcel Rügenberg) - Jun 3
 - Directional Dark-field Imaging (Yasmin Blunck) - Jun 3
- Optical Imaging Methods
 - Optical Overview (Eleni Siampali) - Jun 17
 - Hybrid FMT-XCT (Kanishka Sharma) - Jun 17
 - Early Photon Tomography (Martin Walzl) - Jun 17
 - Mesoscopic Fluorescence Tomography (Deepak Murali) - Jun 17
 - Multispectral Opto-acoustic Tomography (Hemal Naik) - Jun 20
 - Intraoperative Multispectral (Anastasia Tseneklidou) - Jun 20
- Nuclear Imaging Methods
 - PET/MR (Ayah Haidar) - Jun 20
 - PET+motion (Pinar Firat) - Jun 24
 - CT+motion (Lorand Gal) - Jun 24
 - Freehand SPECT (Max-Emanuel Hoffmann) - Jun 24

--> 5 block sessions
of 3-4 talks each