

# Authoring a Scientific Paper in Computer Graphics

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- Introduction
  - ◆ What is a “paper”?
  - ◆ Why should I write one?
- Guide for writing a paper
  - ◆ Content
  - ◆ Structure
  - ◆ Style
- Summary



# What Is a „Paper“?

- Scientific text
- About a research contribution
- Published in a scientific forum



- Universities
  - ◆ Students (Diploma, Ph.D.)
  - ◆ Research assistants/professors
- Other research institutions
  - ◆ Fraunhofer, Max-Planck, Akademie der Wissenschaften, etc.
- Companies
  - ◆ Microsoft Research, Adobe, Apple, Google, VRVis, etc.



## ■ Conferences

- ◆ Organized by scientific societies
  - “ACM Siggraph”, “Eurographics”, “EGSR”, “Pacific Graphics”, “WSCG”, “SCCG”, ...
- ◆ Call for papers (hard deadline)
- ◆ Peer reviewing (double blind)
  - Evaluation by several scientists in the field
  - Ensures high quality
- ◆ Give a talk at the conference
- ◆ Paper printed in conference proceedings



## ■ Scientific journals

- ◆ Publishing house and/or scientific societies
- ◆ “Transactions on Graphics”, “Computer Graphics Forum”, “TVCG”, “C&G”, ...
- ◆ No hard deadlines
- ◆ Peer reviewing (single blind)
- ◆ Publishing process takes  $\frac{1}{2}$  up to 2 years

## ■ Technical report

- ◆ Internal in institution, put online
- ◆ Should avoid stealing of ideas..(?)



- Knowledge dissemination
- Performance evaluation for scientists
  - ◆ Number and quality of papers per year
  - ◆ H-Index, publish or perish
- Performance evaluation for Universities/institutions/etc.
  - ◆ Increase visibility
  - ◆ Get more money through project proposals
  - ◆ Invitations to talks, STAR reports, etc.
  - ◆ Invitations to program committees, scientific societies, etc.

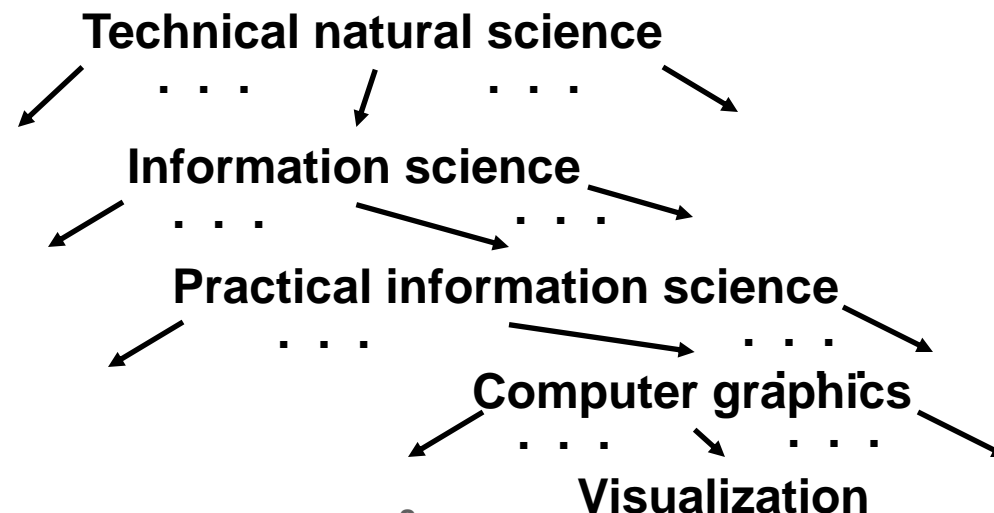


- Guide for writing a paper





- **Content: scientific knowledge/insights/results**
  - ◆ New techniques/algorithms/interactions
  - ◆ Originality is important
  - ◆ NO documentation of software systems, very small improvements, etc.
  - ◆ Very strong diversification:



- Target audience: researcher
  - ◆ Reader not necessarily insider
    - ➔ generally understandable style
  - ◆ Easy extraction of relevant information
  - ◆ Main points accurate, but compact (!)



- Motivation
- Contribution
  - ◆ Tell it in the
    - Abstract
    - Introduction
    - Conclusion
- Story



## ■ Structure:

- ◆ Heading, authors (+ affiliations)
- ◆ Abstract
  - Problem description and main solution idea
  - NO background knowledge, details, etc.
  - 100-300 words (1-3 paragraphs)
- ◆ Introduction
  - Problem statement and importance
  - Assumptions / limitations and rough solution
  - Advantages compared to previous solutions
  - ◆ Raise interest in your work (contribution)



- Structure (cont):
  - ◆ Related work
    - Scope of own idea and difference to existing work
    - Solid literature review!
      - ◆ Did not cite ➔ “not read” or “not recognized”
      - ◆ Paper quality determined by no. of references
  - ◆ Description of actual work
    - Conceptual view (solution idea)
    - Implementation (concrete example)
    - Results



- Structure (cont):
  - ◆ Summary and conclusion
    - Repeat problem, solution idea and results
    - Discuss limitations, unanswered / new questions
    - Future work (improvements, extensions)
  - ◆ Acknowledgements
  - ◆ Bibliography



## ■ Style:

### ◆ English! (by far most common)

- Leo Dictionary: <http://dict.leo.org/?lang=de>
- Use a spellchecker
- Grammar slammer (hyphens, capitalization, that/which/commas, ...)
- Give colleagues for proof reading

### ◆ Objectivity

- No humorous descriptions, exaggerations, excessively long texts, etc.



- Style (cont):
  - ◆ Introduce abbreviations on first use
  - ◆ Short, simple sentences
    - Complexity in content, not in style!
    - No-go: “if X and Y or Z, then P or Q”
  - ◆ Consistency
    - Time
      - Don't use 10 words for the same thing
  - ◆ No deep hierarchies
  - ◆ No single-sentence paragraphs





- Style (cont):
  - ◆ Figures and tables
    - Continuous enumeration
    - Each has to be referenced in text
    - Useful captions (more than 1-2 words)
  - ◆ Formatting
    - Typically given by conference/journal template
    - Latex helps



- **Style (cont):**
  - ◆ Citations and bibliography
    - Only cite most relevant parts
    - Verbal citing very uncommon in CG
    - Avoid citing websites
      - ◆ Not very reliable information
      - ◆ Useful to find technical reports
    - Many different citation and bibliography styles
      - ◆ Typically given by templates
    - Citation is not a noun!



- Writing a paper = using Latex!!!
- Great tools for windows:
  - ◆ Miktex
  - ◆ Texniccenter (others are available)
    - Create a project file
  - ◆ Idea: use an svn for Latex
  - ◆ Sumatrapdf: supports forward search!
    - Google „sumatrapdf forward“



- Images
  - ◆ Use .png or .jpg directly
- Vector graphics
  - ◆ Use .pdf files
- But figures in separate directory
  - ◆ `\graphicspath{{./figures}}`



- There are 3 ways how to find papers:
  1. Google
  2. Google
  3. Google



# Where to find papers?

- Problem 1: finding the reference
- Problem 2: finding the full text



- Start with an existing paper and look at refs
- Google keywords
- Google keywords together with „eurographics“, „siggraph“ etc.
- Bibliography engines
  - ◆ → important forward citations!
  - ◆ ACM Digital library
  - ◆ Citeseer
  - ◆ Google Scholar



- Google
- Google Scholar (scholar.google.com)
- MS Academic Search  
(academic.research.microsoft.com)
- Author homepages
- Citeseer (caches many pdfs)
- Hardcopy in library!
  - ◆ [www.cg.tuwien.ac.at/library](http://www.cg.tuwien.ac.at/library)
- Via Hauptbibliothek (electronic journals)





- Directly from Publisher:
  - ◆ ACM Digital library ([www.acm.org/dl](http://www.acm.org/dl))
    - Access with IP at TU Wien (use VPN)
  - ◆ EUROGRAPHICS digital library ([www.eg.org](http://www.eg.org))
    - Access with IP from Institute (come here 😊 )
  - ◆ IEEE ([www.ieeexplore.org](http://www.ieeexplore.org))
    - Access with IP at TU Wien
    - Important: use ieeexplore for search



- Introduction
  - ◆ What is a “paper”?
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  - ◆ Where are they published?
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- Thank you for your attention!
- Are there any questions?



- Show actual material:
  - ◆ Siggraph/Eurographics webpage
  - ◆ Siggraph review form
  - ◆ A paper (e.g.: Imperfect Shadow Maps)
    - Demonstrate everything on this paper

