Authoring a Scientific Paper in Computer Graphics

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Outline

- 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

Who is writing papers?

- 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.

Where are papers published?

- 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

Where are papers published?

- 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 ½ up to 2 years
- Technical report
  - Internal in institution, put online
  - Should avoid stealing of ideas..(?)

What are papers good for?

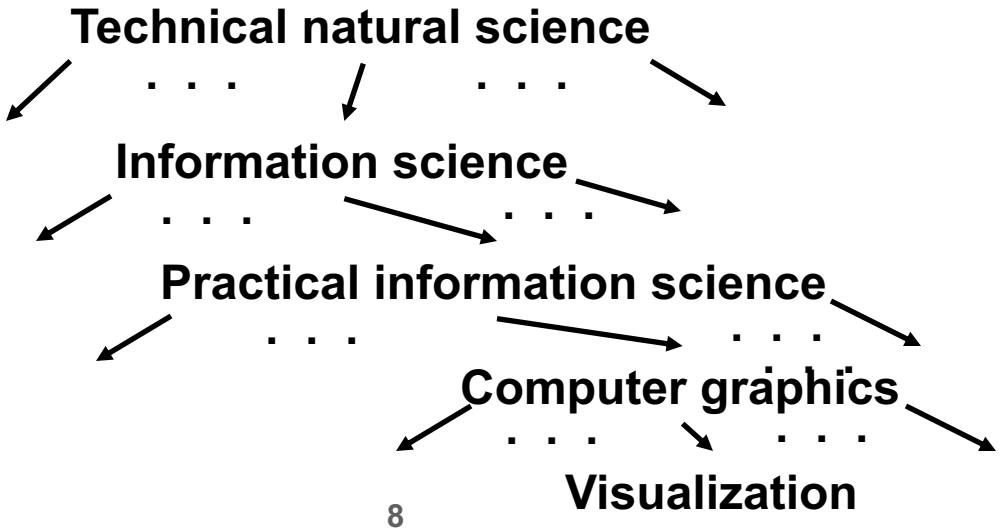
- Knowledge dissemination
- Performance evaluation for scientists
  - Number and quality of papers per year
  - H-Index, publish or perish
- Performance evaluation for Universities/institutions/etc.
  - Increase visibility
  - Get more money through project proposals
  - Invitations to talks, STAR reports,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

Guide for writing a paper

- Guide for writing a paper
  - https://www.cs.dartmouth.edu/~wjarosz/writing.html

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:



Guide for writing a paper

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

Key Ingredients of a Good Paper

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

Guide for writing a paper

- 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)

Guide for writing a paper

- 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

Guide for writing a paper

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

Guide for writing a paper

- 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.

Guide for writing a paper

- 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

Guide for writing a paper

- 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

Guide for writing a paper

- 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!

Latex

- 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“

Latex

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

Where to find papers?

- 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

Finding the Reference

- 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

Finding the Full Text

- 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
- Via Hauptbibliothek (electronic journals)

Finding the Full Text

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

Plagiarism

- Citing other people‘s work
- Citing your own work
- Figures

Summary

- Introduction
  - What is a “paper”?
  - Who writes papers?
  - Where are they published?
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  - Content
  - Structure
  - Style

Authoring a scientific paper in CG

- Thank you for your attention!
- Are there any questions?

Presentation Notes

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