



# Writing Scientific Papers

Scientific Soft Skill Seminar

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# Writing Scientific Papers

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- Why bother?
- Publish or perish
- Publication
  - Invention security
  - Research success measure
  - Academic (tenure-track) ranking
  - Knowledge dissemination

# Presentation Outline

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- Writing procedure
- Scientific writing
- Tips

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- **Writing procedure**
- Scientific writing
- Tips

# Writing Procedure

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1. Pick venue
2. Learn requirements
3. Choose contribution and style
4. Write
5. Prepare additional materials (video)
6. Submit
7. Evaluate reviews
8. Send camera-ready version
9. Bask :-)

# 1. Venue

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- Choice criteria
  - Topic match
  - Impact (prestige, ISI, ...)
  - Publication type (journal?)
  - Deadline
- Where to choose
  - Ask supervisor :-)
  - Conference calendars
    - VRVis, CGC@wikidot, Iris; ACM, EG, IEEE; ...

## 2. Venue Requirements

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- Single-blind vs. double-blind
- Page count
  - Full paper: 6-10 pages, usually 8
  - Short paper: 3-5 pages, usually 4
  - Journal: no hard limits, usually 10-20
  - Poster
- Colour, colour plates
- Additional material size & format

# Writing Software

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- LaTeX
  - Most common, most supported
  - Venue-specific styles available
  - Easiest solution
- Microsoft Office Word
  - Macro packages, available rarely
- Other
  - No support

## 3. Contribution and Style

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- **What** do I present?
  - Match conference topic
  - Keep focused
- **How** do I present it?
  - Compilation, incremental, break-through, critique
- **Output:**
  - Weighted paper structure
  - What to include, what to reference

# 4. Write

- Later ...

# 5. Additional Materials

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- Graphics-specific
  - Very rare in image processing
- **Video**
  - “Sells” the paper
  - Artistic effect important
    - Quality models, script, professional score, ...
  - Include in application design
    - Scriptable camera
- Images, screenshots

## 6. Submission

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- Electronic uploading systems
  - PDF, PostScript
  - Sometimes LaTeX as well
  - Additional materials
- Metadata
  - Contribution, reader benefit, keywords, ...
- Abstract submission
  - Some conferences only
  - 1-2 weeks before paper submission

# 7. Reviews

- 2-3 reviewers' comments
- Scoring part, textual part
  - Usually broad questionnaire w/comments
- Suggestions, but *strong* suggestions
  - Only disregard for well-founded reasons
  - Explain disregarding, if possible
  - Do not overfit
    - Reviewers are subjective, too

# Presentation Outline

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- Writing procedure
- **Scientific writing**
- Tips

# Writing Style

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- Formal style
  - Avoid contractions and colloquialisms
  - Use phrases & idioms sparingly and wisely
- There's no "I" in "paper"
  - Use "we", even in one-author case
- Neither is there a "U"
  - Imperatives are OK ("see", "refer", "consult")
  - Use "the reader" otherwise

# Typical Paper Structure

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- Cover
  - Title, authors, abstract, classification, keywords
- Preface
  - Introduction, related work
- Core
  - Theory, application, implementation
- Wrap-up
  - Results, conclusion, future work, acknowledgements, bibliography, appendices

# Cover

- Title
  - Include important keywords
  - Do not be overly general/overly specific
  - Keep it short
- Authors
  - First author most important
  - Last author ~ general supervisor
  - Mind paper length

# Abstract

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- Around 200 words
  - Problem description
  - Contribution summary
  - Stress on novel parts
- Written first or last
- ACM classification: I.3 through I.5
- 3-5 keywords
  - Do not repeat title or ACM class

# Introduction

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- Problem description
  - Why problem is important
  - What's difficult about it
- Contribution summary
  - What's new
  - What its benefits are
- Paper outline
  - Throwback to tradition

# Related work

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- Ultra-brief summary of existing methods
  - 0.5 - 2 sentences each
- Include latest work
- Include ideas' original authors
- State negatives calmly and mildly
- Use names or “the author(s)”, if necessary
  - Avoid “they”, “(s)he”
  - Keep it de-personalized

# Results

- **Pictures**
  - Include comparisons
- **Framerates, timings**
  - Use tables
  - Describe HW used
- **Real-world scenarios, user studies**
  - If applicable
- **State parameters**

# Wrap-up

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- Conclusion
  - Summarize your contribution
  - Including evaluation
- Future work
  - 2-3 possible extensions/improvements
  - What could be done
    - Not just what you plan to do
    - Can include your plans

# Wrap-up (cont.)

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- Acknowledgements
  - Grants, advisors, data sharers, ...
  - Reviewers, if comments were helpful
- Bibliography
  - Style dictated by venue
- Appendices
  - Derivations, intermediary formulae, big diagrams
  - Parameter values
  - Special cases

# Presentation Outline

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- Writing procedure
- Scientific writing
- **Tips**

# Readability

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- Employ eye candy
  - Use teaser images
  - Sneak an image to the early pages
- Keep it legible and readable
  - Minimize footnote use
  - Avoid overlong paragraphs
  - Refer to figures and equations
  - Use traditional notations

# Formal Aspects

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- Capitalize internal references
  - “see Figure 1; by Algorithm 2; refer to Section 3.1”
  - Do not refer to “Subsection 3.1” or “3.1”
- Max. 2 levels of numbering
  - Lesser headings possible, but without numbers
- Avoid [] citations as sentence subjects
- Use formal linking words
  - Therefore, whereas, however, hereinafter, ...

# Shortening

- Every author's nightmare
- Typical candidates:
  1. Related work
  2. Introduction
  3. Bibliography entries
  4. Theory description
  5. Referencable parts
- Three-phase shortening

# 1. Rational Phase

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- High-level approach
- Remove superfluous text
  - Probably no information
- Reformulate wordy phrases

## 2. Lossless Phase

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- Low-level
- Shorten bibliography entries
  - Pages, months, editors; abbreviations
- Short paragraph-ending lines
  - Language-based shortening
- Can save up to  $\frac{1}{2}$  page

## 3. Lossy Phase

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- If all else fails...
  - Remove headings
  - Join paragraphs
  - Cut down on explanation
  - Reference non-vital parts
  - Remove references
  - Remove data
  - Shrink figures
  - Inline simple equations

# Thank you

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## Questions & discussion