



Research Methodology

Writing papers: Why and how

Writing tiny papers: Abstracts

Lecture, 27. August 2007



The Big Picture

- How to do research in Computer Science
 1. Pick a relevant research question
 2. Work on it and make some progress
 3. Make sure your work is solid and well supported
 4. Write scientific paper about work
 5. Submit paper to conference, workshop, journal,...
 6. If paper is accepted
 - Update CV, Present Paper, goto Step 1 or 2
 7. Else Go To Step 1, 2, 3, 4 or 5



What is a Scientific Paper

- Published Report of Original Results
 - Published means it is accessible
 - Original means it is new
- Primary Publication
 - First publication of new research results
 - Presented so that it can be confirmed
 - Readily available to science community



Various Types of Reports

- Journal Article
 - Complete reviewed description of work and results
 - Primary publication in many fields
- Conference Papers
 - Short reviewed description of work and results
 - Primary publication in some fields
- Technical Reports
 - Description of work, but not reviewed
- Workshop/meeting notes
 - Typically “half baked” ideas or research questions
- Textbooks, Bookchapters, Research notes, etc.



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Motivation for papers

- Ideal motivation
 - This furthers scientific knowledge and community must know about it
- Real motivation
 - Currency of scientific standing
 - Impact on career
 - Impact on standing in community



Writing scientific paper

- Key abilities of author
 - Organization
 - Logic, Clarity and Precision
- “The preparation of a scientific paper has almost nothing to do with literary skill. It is a question of organization.”
 - Robert A. Day, How to Write and Publish a Scientific Paper



Structure of a Scientific Paper

- Title: “Catchy summary of paper content”
- Abstract: “Why should you read our paper”
- Introduction: “What we will tell you”
- Contribution (Main Part): “What we did”
 - Hypothesis, method, evaluation, results
- Related Work: “The context and why new”
- Conclusion: “What we told you”
 - Sometimes also: Discussion, future work
- References: “Where to find context, etc”



Alternative Rule of Thumb

- Introduction
- Methods
- Results And
- Discussion

- **IMRAD**



Considerations

- Audience
 - Who will read the paper
 - What can we assume is known
- Motivation
 - Why was the work done
 - Why should anyone read about it
- Presentation
 - How should the paper read



Presentation – writing style

- Writing styles differ
 - Pick yours, but keep improving it
 - Maintain same style throughout each paper
- Fewer and shorter is better
 - Avoid extra words
 - Keep sentences and paragraphs short
- Self reference
 - We vs I vs “Magic”
 - “We did X” vs “X was done”



Presentation - Arguments

- Paper is about convincing someone
 - Work is relevant to science
 - Work is important to science
 - Work is correct
 - Work is original
- Context and definitions
 - Easier to argue when using standard notation
 - If additional definitions needed, be clear



Mapping of arguments

- Why relevant
 - Motivation in Abstract and Introduction
- Why original
 - Contribution in Abstract, Introduction, Main part
 - Context in Introduction and Related Work
- Why important
 - Importance in Abstract
 - Contribution in Main part, Conclusions, Related Work
- Why correct
 - Evaluation and Results in Main Part



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Common Mistakes

- Oh so many,...



What to expect from Reviewer

- Check your work is relevant
- Check your work is original
- Check your work is correct
- Check you put it in right context
- Check your work fits into publication



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About the Title

- Informative
- Concise
- Memorable
- Original

- Funny?



Abstract

- Lead-in to set up context
 - Often includes motivation
- Problem being addressed
- What was done
 - Key elements of contribution
- What came out
 - Results and impact



Things to keep in mind

- Abstract should be concise
- Abstract should be simple to read
- Abstract should not be cryptic
- Abstract should not leave things out



Project 1: Pick Topic

- Pick a topic to write about
 - Something you are working on
 - Something you will get results from
 - Something to argue about (scientifically)
- Submission
 - Send outline of topic via email to ari@ru.is
 - Not final – can be iterated and modified



Project 2: Good/bad abstracts

- Find one good abstract
 - Decide why it is good
- Find one bad abstract
 - Decide why it is bad
- Submission
 - Both abstracts, with arguments for good/bad
 - Submit via email to ari@ru.is
- <http://citeseer.ittc.ku.edu/>