

# Writing a Research Paper: some collected advices

Premek Brada  
2023-2024

# Anatomy of a Research Paper

- Title
  - Authors and affiliations
  - Abstract (and keywords)
  - Introduction
  - [Background]
  - Related work
  - “Method part”
  - “Findings (Results) part”
  - Discussion (and Threats to Validity)
  - Conclusion
  - [Appendices]
- 
- Cultures differ between disciplines

paper in one paragraph; see next

why we did this

basic facts in the problem domain

what is already there

how and why this way

data, numbers, graphs, tables

why it worked out the way it did, why it should not

contribution

detailed material on method/findings

Shaw, M. (2003). [Writing Good Software Engineering Research Papers](#).  
In *Proceedings of the 25th International Conference on Software Engineering (ICSE 2003)* (pp. 726–736). IEEE Computer Society.

# Abstract

- One paragraph summarizing whole work contained in this paper

## Scheme 1

- what is the problem
- why is that a problem
- how did we solve it
- what did we find and contribute

## Scheme 2

- context
- objective
- method
- results
- conclusion

- Scheme 3: <https://www.scribbr.com/dissertation/abstract/>

# Introduction

- Context
  - incl. references to general/background works
- Focus of this research
  - incl. gaps or shortcomings of current state of the art
- Concrete idea / **research questions** (RQs) pursued
- Structure of the paper

# Method, Results

- Explanation how you worked to answer the questions
  - believable
  - correct
  - repeatable (independently verifiable)
- Description of what you arrived at
  - relation to RQs
  - complete
  - clear and concise
- Be detailed, precise, unambiguous
- Just list the facts, do not evaluate (yet)

# Discussion

- What are the implications of your results / findings
- Evaluate: assumptions, shortcomings (no shortcomings? really?)
- Threats to Validity
  - external – results validity
  - internal – construct validity

# Conclusion

- Concise summary of goals and contribution
  - Refers back to original RQ set in the Introduction
- Ideas for future research/work
  
- Do not: summarize complete content of paper
  
- Consider “Thanks to” (student helpers, colleagues helping develop the idea, anonymous reviewers)

# When to Write What

1. Abstract
2. Method
3. Results
4. Discussion
5. Conclusion
6. Introduction
7. Related work
8. Abstract

(This is not when to *do* what.)

# Language of Research Papers

- “We”
- Paper != advertisement
  - (“excellent”, “always”, “really”, ...)
- A paragraph is a short self-contained story
- Concise, to the point, clear, DRY
  
- Grammarly, LLMs
  
- [Taboo words](#)

# Techniques to learn academic writing

- Read
- Read more
- Read and try to use
  
- Remove stuff
- Remove even more. Be merciless
  
- Collaborate, get feedback
- Rework

# Some sources of help and information

- Short intro –  
<https://psychology.ucsd.edu/undergraduate-program/undergraduate-resources/academic-writing-resources/writing-research-papers/research-paper-structure.html>
- Structure & Content –  
<https://blog.wordvice.com/seminar-how-to-write-an-effective-research-paper/>
- The process of writing –  
<https://www.scribbr.com/category/research-paper/>