

Scientific Writing

PhD, Ass. Prof. O. I. Bogoiavlenskaia
Dept. of Computer Science, PetrSU

Outline

- Scientific style. Logic. Argument.
- Types of scientific papers.
- Formal style requirements.
- Style requirements via Latex (project).
- Graphs in scientific papers.
- Scientific presentation.
- SW project.

Scientific style. Outline

- Terminology of scientific writing
- General structure of scientific research
- Using formal logic rules for writing scientific text
- Planning
- Composition. Headings, columns.
- Language and style

Terminology

- Analogy
- Topicality
- Hypothesis
- Information (review, relevant, referring, signaling)
- Abstract, concept, key word
- Scientific theory, research, report, research area
- Problem (research, scientific, complex), problem formulation

General structure

1. How topical is the problem under research
2. Precise problem formulation
3. Definition of research subject and object
4. Research method selection
5. Research process description
6. Results discussion
7. Conclusion and evaluation of the research results.

Logic

- Scientific text must be logical. Use formal logic methods for descriptions, arguments and proofs.
- A is A . Ideas, formulations, entities and their verbal expressions do not change and/or mix within the text. Don't use synonyms and homonyms.
- A and not A do not hold same time. Very important!
- A is either B or not B . Exclusion of the third one.

Logic

- Low of sufficient foundation. Every idea is inferred from another one (founded by)
- Examples set as a foundation. Sufficient? (incorrect, irrelevant, too few, how typical, conclusion related)
- Analogies, reasons and consequences
- Formulating definitions

Arguments

- Arguments are logical
- Precise formulation of the thesis defended
- Thesis stays unchanged (do not loose it)
- Arguments are true, sufficiently founded, sufficient, independent from the thesis, internally not contradictive
- Too many arguments
- Conventional arguments

Arguments

- Critics: critics of the thesis, critics of the argument, critics of the demonstration
- Negative proofs
- Disproof of the argument
- Disproof of the arguments sufficiency

Planning

- Working planning of the research, includes headlines, topics etc.
- Working plan develops and extends
- Schedule
- Do writing during research work.
Do it right way!
- Start you paper from outline. Discuss outline with your adviser.

Planning

- Choose topic
- Bibliography
- First Outline
- Research process within the schedule. How flexible?
- Extended outline. Results
- First Draft
- Refining

Composition

1. Title
2. Outline
3. Introduction
4. Main part
5. Conclusion
6. Acknowledgements
7. Bibliography
8. Appendices
9. Indices

Composition

- Headlines divide text into logical parts. Vital for readability and overall impression
- Paragraph is minimal unit.
- Facts within the paragraph are logically connected (chronology, set of features)
- Parts, sections, subsections etc.
- Division by categories, complete and continuous
- Enumeration

Language & Style

- Completeness, integrity, connectivity
- Special syntactic tools, turns of speech
- Pragmatic targeting
- Choose terms and hold them tight
- Hard drive is a computer device. Winchester is a rifle
- No expression. Evaluation fixes features that a term possesses
- Passive forms, imperfect tense
- We instead of I. Impersonal sentence

Language & Style

- Minimal individual style features, no emotional evaluations and impressions
- Brevity, simplicity and precision
- Excess of ‘scientific turn’ does not make the text scientific
- Avoid general characteristic. Use narrow terms. Special device?
- Precision helps to achieve simplicity

Language & Style

- Is brevity your sister?
- Say only what is necessary to say. Cast away everything else (break interval, internal interior)
- Close words follow each other. Choose one
- Acronyms, key words, standard cuts
- Rephrase if you can save several letters or blanks.
- Simple sentences
- Lists

See also

- For Russian
Кузин Ф.А. Магистерская диссертация. Методика написания, правила оформления и процедура защиты. Практическое пособие для студентов магистрантов.
- For English
Strunk W. Style and ... TBA