How to write and review a scientific article

Recommendations to authors

1. Decide on the purpose of the article:

    a) can be written, but not necessary;

    b) clarify the purpose during the work on the article.

2. Choose a title of the article:

    a) clarify the title during the work on the article.

3. Write a plan of 6-10 items, for example:

    a) Introduction

    b) Motivation

    c) State of the Art / Related Work

    d) Problem Statement

    e) General Design / Overview

    f) Implementation

    g) Evaluation

    h) Conclusion

    i) References

4. Write a more detailed plan. Here are some tips:

    a) Introduction

    i. explain the relevance of the study;

    ii. formulate the essence of the problem:

        1. describe expected difficulties to achieve the goal of the study;

    iii. describe the article structure.

    b) **Motivation** contains both an explanation of why the author decided to perform this study and why the reader should read this article; it could be:

    i. solving an important practical problem (e.g., improving the reliability of a certain class of systems that were not previously reliable enough, etc.);

    ii. solving a theoretical problem (proof or refutation of a known hypothesis; finding links between different research areas that previously seemed unrelated and justifying the possibility of mutual enrichment of these areas through the integration of methods, approaches, and tools, etc.).

c) **State of the Art / Related Work** (this section may be placed before Conclusion as a summarizing assessment of the result achieved)

    i. it is necessary not only to list which works consider similar problems, but also to

        1. mention the approaches used in those works;

        2. evaluate the results;

        3. outline the scope of applicability;

        4. indicate what is the advantage of the suggested approach (what the existing works are lacking for);

    ii. review not only other people's work, but also your own (describe how the previous results have been improved);

    iii. when summarizing the survey, lead a reader to the idea that the proposed solution has a scientific novelty.

d) **Problem Statement** is a concise description of what results to obtain and what source data to use.

    i. if there are restrictions on a method for obtaining the results (for example, it should be static code analysis, not dynamic), indicate them;

    ii. formulate a criteria for evaluating the result (how to evaluate its success and completeness).

e) **General Design / Overview**

f) **Implementation**

    i. describe how your tool/process looks in reality (structure/architecture of the system);

    ii. itemize tools and technologies used.

g) **Evaluation**

    i. clarify the evaluation criteria and explain why the selected characteristics are significant (e.g., they are accepted in the scientific community or are directly related to performance, reliability, etc.);

    ii. describe methods for measuring/estimating the characteristics;

    iii. present the results of estimation;

    iv. summarize whether the goal of the work is achieved (which method achieves the goal, if several methods have been considered).

h) **Conclusion**

    i. summarize:

        1. what problem was the subject of the study;

        2. what is the idea of the suggested approach and what is its novelty (in comparison with your own works and the works of other authors);

      3. what results were obtained;

      4. what is the potential impact of the results (new perspectives in the research area and practical applications);

    ii. add acknowledgments (if required).

  i) **References** are an important element of the article:

    i. short list (less than 20 items) demonstrates the scientific narrowness of the author;

    ii. off-topic links and large percentage of self-citations indicate scientific uncleanliness;

    iii. a large number of outdated links (more than 5 years) are alarming (if there are no new works but the topic is still relevant, the author should dwell on this fact and draw a reader's attention to such an oddity);

    iv. if the majority of links are Internet resources, this shows that the author is not familiar with leading scientific works.

5. You can write the article in a random order:

  a) return to the title from time to time and clarify it so as to fit the content of the article;

  b) show the article to your colleagues:

    i. after receiving criticism, be sure to thank your colleague/reviewer;

    ii. do not refuse to review works of your colleagues, then they will not refuse you;

  c) along with writing the article, prepare presentation slides (at least a presentation scenario):

    i. tables and illustrations will be shared.

6. Usually, you are allowed to submit your article to a magazine/conference website several times. Take this opportunity. Once the article has reached a certain level of integrity and completeness, upload it to the site; then you can gradually improve the text without missing a deadline.

  a) analyze how the article is balanced and, possibly, clarify the title again;

  b) check consistency of the title, the abstract, the problem statement, and the conclusion.

7. Verify formatting and other technical requirements.

Recommendations to reviewers

Section	Evaluation Criteria
Title	• The title matches the content • Correct terminology is used • There are no useless acronyms and abbreviations
Introduction	• Relevance is justified • Essence of the problem is formulated • Novelty of the approach is described

Motivation	• The problem is interesting • The problem is not trivial
Related Work	• The survey looks complete • All mentioned works address related problems
Problem Statement	• The problem is clearly formulated
General Design	• General design is clearly described • The approach is original
Implementation	• Implementation is clearly described • There are no unnecessary details • Unobvious solutions are explained
Evaluation	• Evaluation criteria are clearly defined • Criteria are adequate to the problem • There are enough experiments • Estimation seems convincing
Conclusion	• Conclusions follow from the content • The article is original (no improper borrowing)
References	• References are quite new • There are no useless items • The number of domestic and foreign sources is balanced • The total number of sources is at least 20 (preferably)