

How To Write A Good Technical Research Paper

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Abstract

Research is “gathering the information one needs to answer a question and thereby help solve the problem”. Technical research papers are meant to disseminate knowledge and understanding of the specific research output of the work carried by the author(s), to the readers in a neat, systematic and efficient way. This document is in fact to the point and tries to give this information in a concise and precise way to help researchers and students planning to pursue a career in research.

Keywords : Technical Paper, Writing, Structure, Research

1 Introduction

Technical papers have been standardised for the sake of publishing research output for easy and efficient understanding of the reader. The structure of a technical paper should have the title, abstract, keywords, introduction, system model, numerical results, conclusions, references and the appendix. The paper tries to explain in simple style, what essentially should be included in each of these sections.

2 The Structure of a Technical Paper

The different components of a technical paper are explained in simple and lucid language for easy understanding.

1. Title

The title should be concise and in most cases not more than ten words long.

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2. Author details

This will include the Name and Institution / Dept to which the author is attached. Additionally, the email address of the author(s) can be provided if the reader would like to contact the author.

3. Abstract

The abstract gives the summary of the paper, brief description of the problem, solution and conclusions in not more than 80 to 120 words.

4. Keywords

These are provided to facilitate a computerised search, six to eight words is enough.

5. Introduction

The introduction should explain the background of the problem, the importance of the problem, other important work in the area which is properly referenced. Proposed solution should be briefly described, and explained to show how it is different and superior to the existing solutions. It should also have a summary of the remaining sections in the paper.

6. System Model / Experimentation setup

A detailed description of the model/experimentation setup is presented here. All the assumptions are stated here (of course, they have to be realistic..) Figures can be liberally used to explain the model.

7. Numerical results

The numerical results are based on the work and they should facilitate the readers' understanding of the model and its solution. Figures and Tables should be used to describe the results. The parameter values used in the model should be realistic or compare with known published values of the parameters from literature. All the results should be interpreted. Why the curves look the way they are? (is it due to assumptions or the system behaviour ?)

In simulation results, which are done to validate the results, show the average values of simulation results and their confidence intervals. Details of simulation time, computer used and language used for coding should be provided.

8. Conclusions

What has been concluded based on the results? A description of the future research should also be included. At times it adds value to the paper if the major limitations of the work is highlighted.

9. References

List of papers referenced in the work is included here. Easily available versions of the papers should be included. Research reports / memos / working papers etc. need to be avoided.

10. Appendix

Material not essential to the understanding of the paper, but needed to ensure the completeness of the paper is included in this section. Mathematical proofs etc. are included here.

11. Figures

Figures should be placed where they are referenced to in the model. They should be readable independently without relying on the description. A brief description of the figure / graphs / tables etc. is necessary in the text of the paper in the system description / results section as the case may be. Symbols should be explained with proper and legible legends. Figures and legends should not be too small, they should be easily readable.

12. Acknowledgement

If you wish to thank your Supervisor, colleagues or referees for their comments in making the paper richer, be liberal in your words.

3 Conclusion

If the above standard format is used, it is surprising how efficiently it is able to gather knowledge from other sources and disseminate knowledge to others in an equally efficient and convenient way. It is indeed a very valuable acquired skill one will never regret for in life and can use throughout one's research life and career.

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