

# Beginner's Guide to Writing a Good Technical Article (in the Field of Electronic Design & Test)

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Writing papers should follow the same principles as the art of storytelling! You need to have a clear, cohesive flow with a clear message, easy to follow, and (preferably) fun to read.

- A good article will carefully combine solid technical content and meticulous easy-to-comprehend presentation!
- Begin with good organization by first dividing the content into clear, logical sections and subsections.
- Based on the target audience of your article, provide adequate background on the topic and describe related work. It will help readers to better understand your contribution while helping them distinguish your contributions from others.
- Clearly mention the nature of your contribution at the beginning (in the abstract and/or introduction), especially if it is a survey or review paper.

Here are some suggestions on writing different parts of the article:

1. **Title:** The title is a very important part of the paper. *It should clearly.....*
2. **Keywords:**
  - Provide keywords that represent and encompass the content of the article.
  - Keep in mind that keywords are used to search articles on a specific topic; therefore, you should choose keywords judiciously such that readers are likely to find your article when searching on a relevant topic.

***Flow of the entire paper and the introduction should be nearly the same.***

3. **Abstract**
  - Should have a similar flow as the introduction except that it should highlight the relevance of the problem and the novel contributions.
  - It should also add a sentence or two on results (i.e., a quantitative evaluation of the proposed approach in comparison with existing ones.)
4. **Introduction**
  - The introduction should have the following flow: The Problem, Existing Solutions, Limitation of Existing Solutions, Motivation for a New Solution, Proposed Solution, [Itemized Contributions], [Summary of Results], Paper Structure.

## 5. Body

- In the body of the paper, the general flow after the Introduction should be:
- **Background [& Motivation]:** Problem, Related Work and Motivation
  - **[Contribution]** (Itemized list of contributions if not already provided in the Introduction). Also, clearly acknowledge any background work you have built your work on or taken inspiration from.
  - **[Motivational Example]** (If you have a simple, easy-to-understand example to illustrate the key ideas, include it before going into details of the approach or proposed solution.
- **Technical Approach:**
  - You can break this up into multiple sections or sub-sections.
  - This is the central part of your contribution, so make sure you explain your solution in enough details and with enough clarity to ensure your readers understand.
  - Use illustrative figures to help explain the key aspects of your approach.
  - Judiciously use mathematical analysis, proofs, lemmas, etc. to make certain claims convincing.
- **Results and Analysis:** Simulation/Experimental Setup, Results
  - For each result shown as a table or plot, describe (1) the objective of the specific study; (2) the test setup and benchmarks used; (3) what you expect to observe; and (4) what you actually observe.
  - Include an analysis of the observed trend, and provide explanations on how and why you observed the trend. Make sure to describe the comparison points (i.e. competitive approach) and describe the merit of the proposed approach compared to the best existing ones.
  - It will be better to mention the overall trend and summarize the observed benefits/issues at the end of the results section.
- **Discussion**
  - Here, discuss any extension of the approach, any shortcomings
  - **Future Directions:** Describe possible extensions of the approach or application of the approach to other areas
- **Conclusion:** do **not** repeat the abstract or introduction. Conclusion should have the following flow:
  - One sentence to describe the context of the work
  - The presented solution
  - Summary of important observations (e.g. the proposed solution can improve the energy efficiency ....)
  - Challenges faced and the ways they are addressed
  - Potential pitfalls (limitations of the proposed solution e.g. in terms of the scope AND possible cost/overhead)
  - The ways to combine the proposed approach with existing approaches (e.g. this is complementary to voltage scaling and can be combined with those approaches to improve energy saving.)

### Miscellaneous General Comments:

- Sentences should be short and clear.
- The text should have a LOGICAL flow. Make sure you do not use fluffy repetitive text, instead try to reasonably condense the text.
- **Readability is key:** make sure your text is readable, and ensure that the major points describing your contributions are highlighted.
- Feel free to italicize or boldface the important terms.
- Sometimes abbreviating a new term you're introducing is helpful in avoiding too much repetition of the same set of words, as well as reducing the size of the text.
- **The illustrations and plots must be clear and crisp.** (Some people read the paper through figures/plots - so they should be self-explanatory.) Be METICULOUS with the figures and plots. DO NOT clutter them - but make sure to provide important details in the figures. Make sure the figures are "illustrative" – i.e. they help in explaining a key concept or a trend.
- **Proof-read multiple times** before you submit your article. Remember, iterations with careful effort to improve the readability makes it perfect!
- It may help to proof-read the printed hardcopy (at least) once before submission! Note that many reviewers like to read printed version instead of a soft copy.
- The tables should have foot notes to explain some important points. For example, if you leave an entry blank, you can explain why it is blank.
- Feel free to put footnotes in the paper to explain a keyword or idea which is not directly related but is still in context.
- Take special care of Figure & Table captions - they should not be too vague or too short. Try to include a brief description on the key point the figure/table is illustrating.
- Sometimes, adding an Appendix to provide more details on an approach or its foundation (e.g. proof of an algorithm, hardware implementation details of a chip, or experiment/simulation process) would be helpful. Check if the target journal/conference proceeding allows adding an appendix to your article.