SSE MASTER'S PROJECT AND THESIS GUIDELINES

APPENDIX 2

Preparing a Technical Paper for Possible Publication in a Journal

by

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Abstract – Every journal requires that authors submit an abstract of their manuscript. As in this paper you should always include a separate page with the title and manuscript abstract. The abstract is a concise discussion about the paper. In general terms, an abstract should address the following five points:

1. Clearly introduce the problem that the manuscript is discussing/addressing,
2. Discuss the problem background. That is, discuss the research that has been previously conducted by you or others in the field (or related fields) to solve/address the same or similar problem,
3. Develop a succinct argument for the methods or ideas proposed in your manuscript,
4. Present a clear and understandable justification of why the proposed methods or ideas contribute to a superior or different solution to the problem. A clear statement of your contributions is often crucial to reviewers. Clear specify this when possible. And finally,
5. Discuss the likely future directions of the research being conducted by you (your group).

[*] Contributing author: include Fax # and E-mail address

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Abstract – Same as the previous page.

1. Introduction

This section presents a general guide for preparing a technical manuscript. As a pre-requisite, you must define the correct editing format. Instructions on manuscript editing and formatting can usually be found in the "information for contributors" section on the back cover of any issue of the journal being targeted for submission or on the information for authors' link at the web page of the journal. If the journal is Systems Engineering, the authors can consult the back cover of any issue or the URL http://www.interscience.wiley.com/jpages/1098-1241/authors.html for the required editing and formatting information. If you are not certain of your target journal, we recommend that you use the Systems Engineering Journal guidelines as your default guidelines. It is important to strictly follow the journal guidelines or the manuscript may be returned without consideration. While each journal has a different set of editing and formatting guidelines, all manuscripts should follow a set of established conventions.

1.1 Text and Indenting

Text is usually set in one justified column with top, bottom left and right margins of at least 1". All text should be in the same font (usually Times New Roman), 11pt and double spaced except for the manuscript title (14 pt) and text in tables, figures and comments (10pt). Never add any lines space between lines or paragraphs. Finally, first lines of paragraphs are usually indented.

1.2 Equations

Equations are not indented. They should be numbered consecutively and the corresponding number should be placed at the end of the line between parentheses. Equations are called by these numbers within the manuscript. It is important to remember that only equations that are called should have a number. As an example of equation editing and formatting consider Equation (1):

$$R = 1 - P\left(\bigcup_{h=1}^{l} C_h\right) = 1 - \sum_{h=1}^{l} P\left(C_h\right) + \sum_{h<k} P\left(C_h \bigcap C_k\right) - \ldots (-1)^{l} P\left(C_1 \bigcap C_2 \bigcap \ldots \bigcap C_l\right) \qquad (1)$$

where l = number of minimal cut sets and C_h = minimal cut set h .

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1.3 Tables

Tables should be located close to their referring text. They should be numbered consecutively and centered within the text column. All text contained in the tables should be typed in 10pt. Explanations regarding table data should be placed at the foot of the table. The table number and corresponding caption should be typed above the table in 11pt. As an illustration of these guidelines consider Table 1.

Table1.1: Example of table formatting

Successor Matrix*						
u_{ij}	a_1	a_2	a_3	a_4	a_5	a_6
a_1	0	1	1	0	0	0
a_2	0	0	0	0	0	0
a_3	0	0	0	0	0	1
a_4	0	1	0	0	0	0
a_5	0	0	0	1	0	1
a_6	0	0	0	0	0	0

*See note on cycle handling Section 4.1.1

1.4 Figures

Similar to the tables' guidelines, figures should be placed centered within the column text, consecutively numbered and close to their referring text. However, the figure number and the corresponding caption must be typed below the figure in 11pt. As an illustration of these guidelines consider Figure 1.

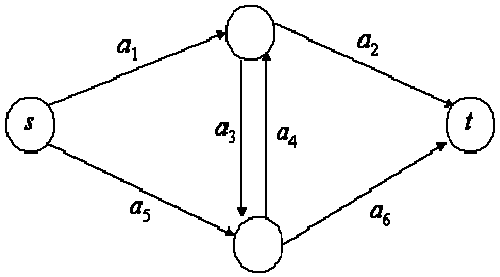

Figure 1.1: Example of figure formatting

2. Technical Content

This section presents a general structure and organization. Although it is not a convention, most technical manuscripts are structured around six sections: Introduction, Background, Body of Work, Results, Conclusions & Future Research and References.

2.1 Introduction

In this section the author should clearly communicate the motivation of the work to be presented in Section 2.3 Body of Work. This section is often the most important from a reviewer's perspective. A

good introduction can provide a good context for the reviewer, allowing better understanding of your research contributions.

2.1.1 Problem Statement

The first paragraph of the introductory section should discuss the problem being addressed. This paragraph should be concise. Usually, it provides a general explanation of the problem.

2.1.2 Problem Motivation

In this paragraph the problem being analyzed should be put in context. The discussion should be focused on why the problem is important. If possible it should explain how solving the problem is likely to have a beneficial impact. In general, this paragraph of the manuscript should make a case for the technical material to follow.

2.1.3 Problem Background

From a very general perspective, these paragraphs present the related research in the permanent literature, and its contributions to the problem area defined in the manuscript. Furthermore, you should also address any drawbacks or restrictions of previously proposed approaches in this "body of knowledge". Similarly, it should communicate how your proposal is unique or different.

2.1.4 Technical Introduction

The last paragraphs should briefly and clearly illustrate the technical material that the manuscript contains. Mathematical content should be avoided within this section. The author should remember that this part of the manuscript can be regarded be as an introduction on how the problem was solved and improvements obtained. Finally, within these paragraphs the remaining sections must be introduced.

Assumptions

Immediately after the last paragraph of the introductory section the manuscript must state all relevant assumptions that you made while conducting your research.

Notation

After all assumptions have been stated the manuscript should introduce the important notations used throughout the paper.

2.2 Background

In this section the manuscript should discuss the most relevant research in the permanent literature related to the problem being analyzed/addressed in the manuscript. As a general rule each area related to the problem should have a separate subsection. Previous work reviewed should be relatively recent and relevant. You should be able to summarize other research efforts targeting the problem space defined by you, illustrate the methods used by other authors, their results and contributions. This is an important section that reflects your familiarity with the research area. Literature review is not only intended to provide a collection of previous research relating to your research area, but also to shed light

on key links and motivations of the current research and this manuscript. The last section of this manuscript presents general reference guidelines.

2.3 Body of Work

This section should describe the research conducted by you. The section can be divided into two interrelated subsections.

2.3.1 Discussion of Proposed Methods

This subsection should elaborate on what and how the methods or techniques proposed contribute to the general area of research. Moreover, the discussion should include a description of how the existing research or "body of knowledge" is complemented by your research. Finally, a paragraph justifying the proposed approach should be included.

2.3.2 Proposed Methods

The subsection should start with a detailed description of how the method was developed. Immediately following the methods, techniques or approaches developed should be presented. This section should contain all mathematical expressions and models developed. Usually, this section can be complemented with diagrams that help illustrate the analysis techniques.

2.4 Results

Results and examples are usually used to provide the reviewers with evidence about the effectiveness of the methods presented in Section 2.3. A detailed description of the example must be given followed by the results or findings obtained from the proposed method. If the manuscript builds upon previous work, the results or findings obtained should be compared with these other methods. Each example should be followed by comments regarding the implications of the results.

3. Conclusions and Future Research

This section allows reviewers to understand implications of proposed methods. In general, this part of the manuscript should communicate improvements accomplished and future directions of this research.

3.1 Conclusions

The conclusion of a manuscript usually initiates with a paragraph discussing the problem that has been solved. Then, it should discuss what the proposed method accomplishes and a general discussion about the results.

3.2 Future Research

Manuscripts are usually concluded with future directives that the work proposed may take. The discussion should be centered on how the current methods could be used to solve more difficult problems.

3.3 References

Guidelines on how to reference previous work can usually be found in the "information for contributors" section in the back cover of any issue of the journal being targeted for submission or on the information for authors' link at the web page of the journal. However, at the end of the manuscript references usually appear in the order they were refer underneath the heading REFERENCES. An Example on the typography for references is given in [1] while examples of actual references [2-3] have been obtained from Ramirez-Marquez *et al* [4].

3.4 On the Importance of References

The main purpose of references is to show that the authors are up-to-date with the latest research central to the manuscript subject, and aware of the relevance of any related research. Also, it shows that the authors have an understanding of any existing drawbacks in the research, and aware of possible avenues of advancing the body of knowledge in this regard.

The manuscript should include articles that contribute to the contextual setting, understanding, and advancement of the manuscript topic.

From an editorial perspective, it is better to have an excess of references rather than having a shortage of references. However, if a manuscript has a small set of references it must make a strong case regarding the lack of research on the proposed topic. If more references related to the manuscript's topic are available and reviewers know it, they will get the impression that the author is not familiar with the topic. The manuscript may be rejected if important references are omitted.

3.5 Acknowledgements

In this section, you can briefly acknowledge any support or suggestions that you might have received from someone who is not one of the co-authors of this technical paper. This is a graceful way to show gratitude for "informal" help and suggestions that you might have received a clarifying data or viewpoint shared by someone, or any editorial support received from someone.

References

1. Last name, First name or Initials. (year) "Title of article" Title of Journal Volume number, Issue Number and Page numbers.

2. Ramirez-Marquez, J.E. and Coit, D. (2004) "A Heuristic for Solving the Redundancy Allocation Problem for Multistate Series-¬Parallel Systems." Reliability Engineering & System Safety, Vol. 83, No.3, pp 341-349.

3. Ramirez-Marquez, J.E. and Coit, D. (2004) "A Monte-Carlo Simulation Approach for Approximating Multi-state Two-Terminal Reliability." Reliability Engineering & System Safety (in print).

4. Ramirez-Marquez, J.E., Coit, D. and Tortorella, M. (2004) "Multi-state Two-Terminal Reliability- A Generalized Path Set Approach." Stevens Institute of Technology Working Paper SEEM R-104, (under review, *IIE Transactions*).