Specification for CMPUT 603 Paper # 1

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Abstract

This document specifies the paper to be produced in the first assignment for CMPUT 603 Teaching and Research Methods. This first assignment focuses on the formal aspects of composing a research paper. It is designed to offer the students an opportunity to experiment with many aspects of composing a technical paper. Examples include the integration of figures, tables, graphs, and bibliographic references into the final paper.

The paper is divided into two major components. The first component is centered on a research paper choosen by the student. It asks the student do (1) summarize that research paper; (2) provide an up-to-date literature review on the research topic; (3) present a novel research proposal to extend the work described on the research paper. The second component is a standalone presentation and analysis of data collected on an experiment conducted by the student. The focus of this second component is on the presentation of experimental data results and on the analysis of that data.

1 Introduction

The typographic construction of a document is a complex task that is often taken for granted by readers. Over the past three decades several tools were developed to facilitate the communication of research results through technical papers. A diversity of tools for typographic composition are available, *e.g.,* Adobe[TM] Framemaker [5]. In the Science and Engineering communities, the most frequently used tools are Microsoft[TM] Word and LaTeX [7]. The goal of this assignment is to create an opportunity for CMPUT 603 students to experiment with the typographic composition of a research paper. CMPUT 603 favors the use of LaTeX because it is a powerful tool for the needs of the Computing Science community. However students are free to use any tools that they want, as long as their papers comply with the formatting and typesetting standards required for the paper.

This document contains the instructions for the paper that each student will produce for the first assignment for

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Title
Author and affiliation
Abstract
1. Introduction
2. Summary of Research Paper
3. Related Work
4. Research Proposal
5. Experimental Study
Conclusion
Acknowlegments
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Figure 1. Organization for Paper #1.

CMPUT 603. Henceforth this paper will be referred to as *paper #1*. Paper #1 will have the organization shown in Figure 1. The title, abstract, and sections 1-4 are related to a research paper choosen by the student. This research paper must have been published, or accepted for publication, in a reputable refereed conference or journal. The student cannot be one of the authors of the research paper.

The introduction is the most important section of any research paper, and often it is the last section to be written. The role of the introduction is to bring the reader into the subject, to argue for the importance of the topic studied in the paper, and to discuss the relevance of the topic. The introduction often highlights the contributions made in the paper. The introduction should be written in a way that makes the reader want to continue reading the paper.

In the introduction for paper #1, you should introduce the field that your selected research paper is from. Furthermore, you should identify the significant contributions of the research, and identify why these contributions are important to the field. While the introduction of the research paper will address many of these issues, do not copy material from the paper. Express the contributions of the work in your own words. If the paper was not recently published, contributions of the work may have divereged from the authors expectations. You do not need to agree with the authors about what thier contributions are, or the significance of those contributions. However, if you do disagree with the authors, your related work section should provide support-

ing evidence for your position.

The remainder of this document discusses the role of sections 2-4 of paper #1. The peer-based evaluation process for paper #1 is discussed in Section A. Section B presents examples of displayed material in a LATEX document. Finally Section C provides the formating guidelines.

2 Summary of Research Paper

The importance of the topic studied in the research paper has already been discussed in the introduction. The introduction has also convinced the reader of the relevance of the problem. The role of this section is to summarize the contribution of the research paper. This summary section is descriptive and focuses on the results obtained in the research paper. A good research paper changes the state of the art on the problem that it addresses. This section should state what is the change that the research paper caused.

3 Related Work

A related work section is a comparative analysis of the work done by other researchers in relation to the research results being presented. In this case paper #1 will do a comparative analysis of the work done by other researchers with the work presented in the research paper. Typically when a new research paper is being written, all related work has been done either in the past, or concurrently with the work presented in the paper. In the case of paper #1, it is possible that some related work was done after the publication of the research paper. Paper #1 should also compare these newer results with the results presented in the research paper.

This section should provide a succinct description of the "state of the art" of the field where the original research was done and where the research proposed in Section 4 will be done. For example, a network topology problem could lead to future work in the field of graph theory to characterize the problem and prove the complexity of solving it optimal. However, more likely both the original work and future work will occur in the same field of research.

A related work section is not simply a list of the authors that also worked in the field with a one-line summary of their papers.[1] Instead, a good related work section offers a critical comparative analysis between the approaches taken by other authors to the same problem. Sometimes a paper may be related not because it is addressing the same problem, but because it is using the same technique/methodology. Paper #1 should discuss at least four research papers that are related to the paper summarized.

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[1] It is not uncommon for lazy writers to simply copy this one-line summary from the abstract of those papers.

4 Research Proposal

This section presents a research proposal. This research proposal describes the research that could be done as a result of the publication of the research paper. This proposal would be the equivalent of the "future work" section of a thesis. It may focus on questions that were not answered in the research paper. Alternatively it may focus on extensions to the research described in the research paper. If the research paper has a "future work" section it may be used as a starting point, however this section should not simply re-state the ideas discussed there. This section must introduce new questions and ideas that were not contemplated by the authors of the research paper. A good research proposal should include a measure of success, *i.e.,* it should discuss how the sponsors of the research will be able to decide if their money was invested wisely.

5 Experimental Study

This section is a standalone experimental study that is not related in anyway with the previous sections of paper #1. The purpose of this section is to afford an opportunity for students to organize data for presentation and demonstrate their ability to do data analysis.

Experiments will be performed using the Weka [2] data mining tool. Detailed instructions for setting up and using Weka are provided in our tutorial at:

http://www.cs.ualberta.ca/~c603/weka/

Each student is required to select at least 4 datasets from the provided collection to use in their experiments. Furthermore, each student must select at least 4 classifiers from the list provided in the tutorial to run on the selected datasets. The experiment should be presented in paper #1as if it were the feature experiment in a publication. Therefore, minimum requirements for this section include:

- A description of the experimental setup, including all the tools used, the experimental methodology, and identification of datasets and classifiers used in the experiment.

- A flowchart illustrating the experimental process. Use a tools such as xfig [3] or dia [1] to prepare the figure. Both these tools are installed on the system. Save/export the figure in eps format if you are using latex to prepare paper #1.

- At least one table presenting raw and/or processed data in a meaningful way. This table should be an actual table (*e.g.,*, built using LATEX commands), and not an image of a table.

Evaluation Category	Score
Reviewer Confidence How confident are you on your knowledge in the topic?	
Topic Relevance Are you convinced that the topic is relevant and worthwhile?	
Technical Quality Is the paper sound? Is the writer knowledgeable on the topic?	
Related Work Is the related work a proper comparative analysis?	
Originality of Proposal Is the research proposal original and worth pursuing?	
Experimental Section Is the analysis clear? Do the results make sense?	
Presentation Are figures, graphs, tables, references integrated properly?	
Readability Is the paper easy to read? Does it read like a technical paper?	
Overall Quality Rate the overall quality of the paper	

Recommendation	Accept	Weak Accept	Neutral	Weak Reject	Reject

Table 1. Peer-based referee report for paper #1.

- At least one chart (graph) that facilitates comparisons of experimental results. This chart should be created from a (possibly pre-processed) data file and a script for a graphing program such as gnuplot [11] or matlab [9]. Gnuplot is availible on the system, but Matlab requires a licence and is only availible on selected machines.

All figures and tables must be properly captioned and numbered, and must be discussed and referenced in the text. Finally, your saved experiment file (.exp), the experimental results output file (.ARFF), data files, and any scripts used to process data or generate graphs should be included when you submit paper #1.

Conclusion

This document provided the specification for CMPUT 603 paper #1. It also serves as an example of a typographic composition for a research paper. Students are encouraged to use the source files for this and other LaTeXdocuments as examples when composing their own papers.

Acknowledgements

A Peer-base Evaluation

The evaluation of paper #1 will use a peer-review process. Referees will bid for papers based on their interest. The assignment of papers to referees will be based on the information collected during this bidding process. Each paper will be refereed by three students. As a consequence each student will referee three papers. The referee will assign grades to the aspects listed in Table 1. Each score should be in the 1-10 range, with 1 representing the lowest score and 10 the highest score.

The peer-reviewing of CMPUT 603 paper will be double-blind, which means that the authors of the papers should ommit their names from the papers submitted. The authors should also refrain to make any reference to themselves or to their own work. If they need to reference papers that they have published in the past they should refer to these papers in the third person, *i.e.,* in the same manner that they would refer to work done by someone else. Likewise, the referees will not identify themselves in their comments
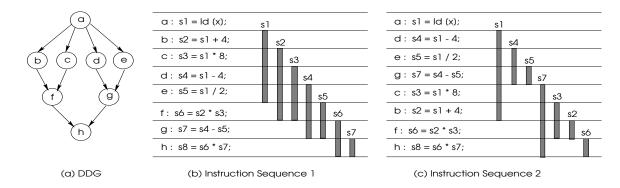
Figure 2. Motivating Example.

and the authors should not know who has refereed their papers

B Examples of Displayed Material

This section presents examples of displayed material in a technical paper. The purpose is to provide instances of the use of graphs, tables, and figures in a technical paper composed using LaTeX. All the examples are extracted from published, or soon to be published, papers.
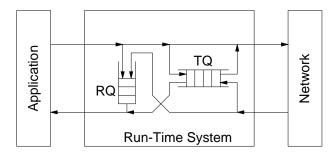

Figure 3. Internal Queues in the EARTH Runtime System.

Figure 2 is an example of a figure that spams two colums. This figure is the motivating example for the local register allocation problem solved by Govindarajan *et al.* in [4].

Figure 3 presents the internal queues in a multi-threading runtime system. RQ stands for Ready Queue and TQ stands for Token Queue [6]. This figure was produced with the `xfig` software available on Linux systems. It was then exported to the Encapsulated Postscript format, thus the suffix `.eps` in the name of the file containing the figure.

The description of the iterative refinement algorithm shown in Figure 4 appeared in [10]. Notice that the CLAS-SICREFINEMENT algorithm is typeset in a way that facilitates references to the steps of the algorithm in the text. For instance, aftert the initialization the algorithm tests if a path

between s^{n-1} and g^{n-1}, if no such path exists, the algorithm returns $NULL$ (steps B-B).

Sometimes it is useful to create a figure that is formed with subfigures. In this case each subfigure may have its own caption, and the collection of subfigures may have an overall caption. For instance, Figure 5 is used by Zhao *et al.* to contrast the effects on different levels of the memory hierarchy of array reshaping transformations described in [12]. Figure 5(a) shows the changes at the level 3 cache while Figure 5(b) displays the changes in the operation of the Translation Lookaside Buffer (TLB). The graphs presented in Figure 5 were produced using MATLAB [9].

C Formating Instructions

The formatting instructions provided in this page are the same ones, except for the lenght of the paper, that are used for the International Parallel and Distributed Processing Symposium. The detailed instructions are provided for authors that decide to use typesetting systems other than LaTeX. Authors that use LaTeX to typeset their papers may simply use the latex style file provided and should not worry with margins and spacing.[2]

C.1 Number of pages

Paper #1 should be no longer than six printed pages. These six pages include text, graphs, figures, tables, and bibliographic references.

C.2 Margins and page numbering

All printed material, including text, illustrations, and charts, must be kept within a print area 6-7/8 inches (17.5 cm) wide by 8-7/8 inches (22.54 cm) high. Do not write or print anything outside the print area.

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[2]Authors that decide to tweek with the default LaTeX settings provided in order to fit more material in their papers are responsible to ensure that their paper adheres to the formatting instructions provided here.
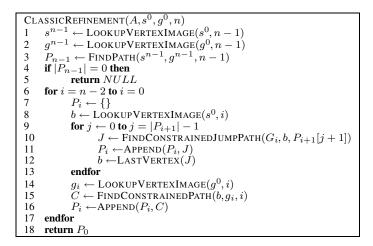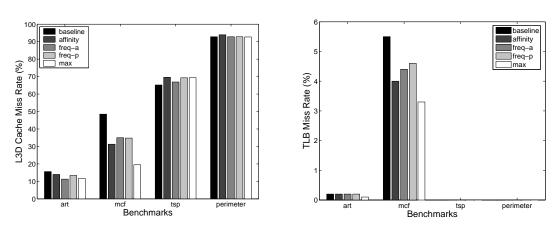
```
CLASSICREFINEMENT(A, s^0, g^0, n)
1    s^{n-1} ← LOOKUPVERTEXIMAGE(s^0, n-1)
2    g^{n-1} ← LOOKUPVERTEXIMAGE(g^0, n-1)
3    P_{n-1} ← FINDPATH(s^{n-1}, g^{n-1}, n-1)
4    if |P_{n-1}| = 0 then
5         return NULL
6    for i = n-2 to i = 0
7         P_i ← {}
8         b ← LOOKUPVERTEXIMAGE(s^0, i)
9         for j ← 0 to j = |P_{i+1}| - 1
10             J ← FINDCONSTRAINEDJUMPPATH(G_i, b, P_{i+1}[j+1])
11             P_i ← APPEND(P_i, J)
12             b ← LASTVERTEX(J)
13        endfor
14        g_i ← LOOKUPVERTEXIMAGE(g^0, i)
15        C ← FINDCONSTRAINEDPATH(b, g_i, i)
16        P_i ← APPEND(P_i, C)
17   endfor
18   return P_0
```

Figure 4. Classic Refinement Algorithm.

(a) L3D Cache Miss Rate on Itanium-II.

(b) TLB Miss Rate on Itanium-II.

Figure 5. Data cache (level 3) and TLB efficiency.

C.3 Formatting your paper

All text must be in a two-column format. The total allowable width of the text area is 6-7/8 inches (17.5 cm) wide by 8-7/8 inches (22.54 cm) high. Columns are to be 3-1/4 inches (8.25 cm) wide, with a 5/16 inch (0.8 cm) space between them. The main title (on the first page) should begin 1.0 inch (2.54 cm) from the top edge of the page. The second and following pages should begin 1.0 inch (2.54 cm) from the top edge. On all pages, the bottom margin should be 1-1/8 inches (2.86 cm) from the bottom edge of the page for 8.5×11-inch paper; for A4 paper, approximately 1-5/8 inches (4.13 cm) from the bottom edge of the page.

C.4 Type-style and fonts

Wherever Times is specified, Times Roman may also be used. If neither is available on your word processor, please use the font closest in appearance to Times that you have access to.

MAIN TITLE. Center the title 1-3/8 inches (3.49 cm) from the top edge of the first page. The title should be in Times 14-point, boldface type. Capitalize the first letter of nouns, pronouns, verbs, adjectives, and adverbs; do not capitalize articles, coordinate conjunctions, or prepositions (unless the title begins with such a word). Leave two blank lines after the title.

AUTHOR NAME(s) and AFFILIATION(s) are to be centered beneath the title and printed in Times 12-point, non-boldface type. This information is to be followed by two blank lines. In the initial submission the authors will ommit their names to allow the double-blind peer refereeing of the papers.

The ABSTRACT and MAIN TEXT are to be in a two-column format.

MAIN TEXT. Type main text in 10-point Times, single-spaced. Do NOT use double-spacing. All paragraphs should be indented 1 pica (approx. 1/6 inch or 0.422 cm). Make sure your text is fully justified—that is, flush left and flush right. Please do not place any additional blank lines between paragraphs. Figure and table captions should be 10-point Helvetica boldface type as in

Figure 6. Example of caption.

Long captions should be set as in
Callouts should be 9-point Helvetica, non-boldface type. Initially capitalize only the first word of section titles and first-, second-, and third-order headings.

FIRST-ORDER HEADINGS. (For example, **1. Introduction**) should be Times 12-point boldface, initially capitalized, flush left, with one blank line before, and one blank line after.

Figure 7. Example of long caption requiring more than one line. It is not typed centered but aligned on both sides and indented with an additional margin on both sides of 1 pica.

SECOND-ORDER HEADINGS. (For example, **1.1. Database elements**) should be Times 11-point boldface, initially capitalized, flush left, with one blank line before, and one after. If you require a third-order heading (we discourage it), use 10-point Times, boldface, initially capitalized, flush left, preceded by one blank line, followed by a period and your text on the same line.

C.5 References

List and number all bibliographical references in 9-point Times, single-spaced, at the end of your paper. When referenced in the text, enclose the citation number in square brackets, for example [8]. Where appropriate, include the name(s) of editors of referenced books.

References

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