



THE UNIVERSITY OF MANITOBA  
**COMP 7840 – Operating Systems Design and Implementation**  
**Survey Paper**

## **Purpose**

The purpose of having you write a survey paper is to give you the opportunity to become closely familiar with the current work being done in a particular area of Operating Systems Design and Implementation so that you both have an appreciation of why the area is of interest and what work remains to be done in that area. This is the most focused part of COMP7840.

## **Paper Content**

Each student will write an individual survey paper on a topic of interest to the operating systems community. This may be a topic that is also relevant to pervasive computing but need not be, if you so choose. The topic must be distinct from those chosen for your in-class presentations.

A survey paper, as the name suggests surveys the current research work done in a particular area and provides a **critical** assessment of the work that has been done. (That is, the strengths and weaknesses of the existing work are presented as well as the work itself.) Brief comparisons between the presented research papers are normally also provided. The source for descriptions of existing research work is normally a collection of research papers presented at respected international conferences and in well known international journals. Access to these sources (primarily online) is provided through the University of Manitoba library system. If you are taking COMP7220 (“Research Methodologies”) you should have already been introduced to the library system. If not, you can ask another student in the class or your instructor for assistance in using the library facilities. In addition to reviewing the existing work, a survey paper normally concludes with a “value-added” discussion of potential future work in the area. If you have not seen a survey paper before, you can use the library system to access the journal “ACM Computing Surveys”. This is a journal dedicated to publishing survey papers. Please note that the majority of the papers presented will be larger in scope than the survey paper you are expected to write. Nevertheless, the structure and content of the surveys will be similar to what you should be doing.

A good survey paper provides a concise but broad review of an area that is accessible to a wide range of readers who will not be researchers **directly** in the presented area. This introduces two primary challenges to writing such a paper. The first challenge is to pick representative papers from within the research area and summarize them concisely. There may be hundreds or thousands of papers available and you have only a few pages to capture the key work in the field. You will need to read the abstracts and conclusions for a relatively large number of papers and select a subset that covers your selected topic area for detailed reading and presentation in your survey. Picking heavily cited papers and those from key conferences and journals is often a good approach. Note that it is easy to tell when a more or less random set of papers has been selected and this will be reflected in your mark for this component of the course. The second challenge is to ensure that your survey paper is easily understandable. The first step to ensuring this is making sure that you, the writer, understand the papers you are surveying. It is very common to have to read a paper two or three times before you fully understand what it is saying. Allocate sufficient time for the reading of the papers not just for the writing of your survey. Also, bear in mind that your audience (those who will read the survey paper) are non-experts in the field. They will typically have general knowledge in operating systems and related areas but not much more. Therefore it is very important to be sure to define/explain all terms used and to present information in a logical order (commonly chronologically by paper publication date). Additionally, the use of diagrams with in-text explanations is very important.



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## **Paper Presentation**

Much of the success of a survey paper is related to its presentation in addition to its content. Readers of survey papers are typically looking to quickly learn about a new area with which they are only partially familiar. To be able to support this, a survey paper needs to be well focused and clearly presented. First, and foremost, the paper must have an appropriate structure. A survey paper should consist of the following parts:

1. a descriptive title (“Survey of ...”) and your name and student number on a separate title page,
2. an abstract (written last) which briefly describes the entire paper,
3. an introduction (written second last) that summarizes what the paper presents without expecting the reader to have already read the paper – this can be tricky,
4. a problem description which explains the problem and motivates interest in it,
5. the actual survey with critical analysis of each paper presented and the liberal use of figures to aid in the exposition,
6. a conclusion which summarizes the paper (now assuming the reader has read it) and which describes possible directions for future research, and
7. a detailed bibliography presented in an easy to read and consistent format

In your survey paper, I will accept the use of figures taken from other research papers as long as appropriate credit is given (e.g. “Figure taken from [28].”). Note that, in general, this is not an acceptable practice and it is always better to create your own examples, etc. for use in figures. Diagrams reproduced from other papers must still be presented clearly. Hard to read bitmap images will result in lost marks. Re-draw the figures if necessary. Appropriate credit must, of course, also be given when quoting passages of text from other papers.

I strongly recommend that you use LaTeX and BibTeX for writing your survey paper. It handles virtually all of the formatting issues and will guarantee a consistent, easy to read, presentation style. Additionally, if you pay attention to the warning messages generated, BibTeX will help to ensure that your bibliographic entries are each complete. If you must cite online references (in most cases you should not), please use a LaTeX formatting package designed for the purpose.

## **Paper Approval Process**

Each topic must be approved by the instructor. Once you have a potential topic, you should send a brief description of the topic to your instructor via e-mail so that he can approve it. Be sure that your topic is not too broad (e.g. “distributed file systems” would likely not be approved whereas “consistency management in distributed file systems” likely would be). The purpose of the approval process is to ensure that a reasonable topic is chosen where you can effectively show appropriate mastery of the area within the constraints of the survey paper.

## **Paper Evaluation**

The survey paper will be worth 40% of your final mark with equal weight placed on content and presentation. It will be due on the official last day of classes (April 11th, 2007) and should be handed in to your instructor in PDF format via e-mail before midnight that day.