

CSC 682: Term Paper

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11 January 2018

For this assignment, you will select a computer security topic and conduct a systematic literature review. A literature review attempts to identify, evaluate, select, and synthesize all high quality research relevant to a specific research topic. A systematic literature review follows a well documented procedure to identify and evaluate research papers on a topic. The topic will be selected by the student, but must be approved by the instructor.

A systematic literature review has three main phases:

1. Planning the review
2. Conducting the review
3. Reporting the review

1 Planning the Review

In the first phase, the student identifies the research question or topic to explore based on his or her interests in computer security. As this project can form the basis for a published paper and/or thesis, it is important to choose a topic that is of sufficient interest to put much time into researching it. Students typically iterate over the precise topic several times, performing test searches of keywords for the research question on a variety of bibliographic databases, refining the topic each time to improve search results. The result of the planning phase is a precise topic statement and an initial list of keywords that will be used in searching for literature on that topic.

A one page single-spaced summary of the topic, including keywords used, and a selection of 6 papers on that topic found using those keywords must be submitted via e-mail as an attachment to the instructor by the due date below. The topic summary document must include the topic and student's name at the top of the page. The class number and student name should be included in the subject line of the e-mail message sent to the instructor.

2 Conducting the Review

In the second phase, the student will develop a search strategy, which will specify which bibliographic databases will be searched and how to search them. The search strategy should be specified as a precise, detailed set of steps that another researcher could repeat and must be documented in your paper. Developing an appropriate search strategy, with the right list of sources and effective techniques to apply keywords is also an iterative process. Your search strategy should be a multi-step process that includes examining citations of the papers you found with your initial keywords. These citations may prompt you to include additional keywords in your search.

The list of databases should include the ACM and IEEE Digital Libraries, along with search engines such as Google Scholar. The web pages of specific conferences, such as ACM CCS, IEEE Security and Privacy, or USENIX Security, or of workshops directly related to the student's topic are worth searching directly too. It is typically best to apply search terms to the body of papers instead of just the titles or abstracts.

Your search will almost certainly produce a set of papers that are too large to examine in detail. In the next step of conducting the review, you will need to eliminate papers. Your review strategy must detail the criteria for this elimination. Some criteria will apply in almost in any review, such as:

1. Duplicate papers.
2. Papers that mention your keywords in passing but do not actually focus on your research topic.
3. Papers that use a different research methodology that your topic focuses on: theoretical instead of empirical, for example.
4. Papers that are too old to be relevant.
5. Papers that offer too little detail to analyze according to your topic.

Once you have eliminated inappropriate papers, you can read the papers in detail to analyze their approaches and to search for appropriate techniques for grouping and categorizing them. It is expected that the number of selected papers that match your criteria will be greater than 15 for this assignment.

3 Writing the Review

In the introduction of the review, include your precise topic statement along with a more lengthy description of the topic, point out trends in what has been published about the topic, and also mention gaps in research. Explain the criteria to be used in identifying papers to review and for analyzing and comparing literature. The last paragraph of the introduction should describe the organization for the paper.

In the body, you will need to both describe your search protocol and the literature that you found in your search. Group the literature according to commonalities, such as approaches to the problem, conclusions, or specific purpose or objective. Summarize individual papers with as much or as little detail as each merits according to its comparative importance in the literature.

In the conclusion, summarize major contributions of significant studies to the topic under review, maintaining the focus established in the introduction. Evaluate the current state of the art for the literature reviewed, pointing out major flaws or gaps in the research, inconsistencies in theory or findings, and areas or issues pertinent to future study. Conclude by providing some insight into the relationship between the topic of the literature review and the broader study of computer security.

4 Format Requirements

The paper must be single-spaced 15-25 pages in length with 1-inch margins using a 12-point font. The paper must use a minimum of 16 sources. It should include a title page and list of references in ACM or IEEE format. Neither the title page nor the references are counted for the page length.

The paper must be submitted as hardcopy in class on the due date below. An electronic copy of the paper must be submitted via e-mail for the same due date.

5 Presentation Requirements

The presentation will be an approximately 25-minute presentation with a 5 minute period for questions in front of the class. The presentation must include the use of appropriate presentation software, such as Beamer, PowerPoint, or Prezi, with effective use of visual aids. Students will be responsible for scheduling their presentation with the instructor for April 26th or May 3rd.

6 Key Dates

Mar 1: Topic proposal submitted to instructor.

Mar 8: Topic selection approved by instructor.

Apr 5: Outline and list of references due.

Apr 26: Final papers due. Presentations.

May 3: Presentations.

7 References

UWisc, How to write a review of literature, <http://writing.wisc.edu/Handbook/ReviewofLiterature.html>.

P. Brereton, B.A. Kitchenham, D. Budgen, M. Turner, and M. Khalil, Lessons from applying the systematic literature review process within the software engineering domain, *The Journal of Systems and Software*, vol. 80, pp. 571-583, 2007.

Anders Kofod-Petersen, How to do a Structured Literature Review in computer science, http://www.idi.ntnu.no/emner/it3708/lectures/notes/SLR_HowTo.pdf, April 16, 2012.

Judith Ramney and Priya Guruprakash Rao, The systematic literature review as a research genre, *Professional Communication Conference (IPCC)*, 2011 IEEE International , vol., no., pp.1-7, 17-19 Oct. 2011