Research Methods Assignment 5

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1 Abstract

This paper attempts to analyze the importance of reading research papers, and various methods to make reading more beneficial for the novice researcher.

2 Introduction

Reading has always been a useful tool to build on our understanding of the world. While taking academic courses, reading can help supplement the student's understanding of the material. This is why professors will assign reading assignments. Perhaps some students will neglect their book, but at least the information is out there for the students who desire it.

When you shift focus to academic research, reading becomes the primary tool in which you gain new knowledge. You can no longer expect to be handed the information via lecture, instead you must seek out new information as it becomes available.

3 Why Read Papers?

As outlined in the introduction, reading is the primary tool for a researcher to gain new knowledge. When a researcher is first starting out, they will have very little knowledge compared to those who have been in the field for many years. The only way that they can catch up to these experts, is to read literature. Once a young researcher has read a significant amount of research papers, they will be able to see what areas in their field that are still open.

Besides the benefits of gaining new knowledge in a field, a researcher can also see ideas from different perspectives. Perhaps a problem that has been plaguing a research project can benefit from analyzing different approaches that other researchers take to solve their problems. This can be true even if the problems are not exactly the same.

A researcher can also become inspired by reading. If a researcher takes great interest in a paper, they may be able to find new ideas by reading a future works section of the paper.

4 Types of Papers

In computer science there are three types of papers: theoretical papers, engineering papers, and empirical papers. Theoretical papers will involve a mathematical proof or description of an algorithms of some kind. An Engineering paper will be an implementation of an algorithm. Lastly an empirical paper will be a description of the design of an experiment.

5 How to Read Papers

When reading papers, a researcher should take into account that every year thousands of CS articles are published every year. [2] It would be impossible to deeply read through all the articles that are published. To avoid this, steps must be taken to sift through the articles and find the ones that benefit the researcher the most.

5.1 First Read

When a researcher first finds an article, the first step is to skim the article to determine if the article is valuable to them. This is not to say that the paper is not valuable, by all account it may be groundbreaking, but if is groundbreaking to someone solving problems in a different field, why waste time deeply analyzing it?

   To skim, the researcher should first read the abstract very closely, then skim the intro, then read the titles to the various sections, and then finally read the conclusion very closely. The goal here is to not understand the details of the paper, but rather, to understand what question or problem the research paper is attempting to address. After the first skim a researcher should also be able to identify what type of paper it is (theoretical, engineering, or empirical), and the overall structure of the paper.

5.2 Deeper Read(s)

After a researcher finishes skimming the article, they can then make the decision as to whether it is worth their time reading again. If it is, the researcher needs to take a much different approach to reading the article. This approach includes analyzing the author's problem, determine if the contribution is significant, and decide if the claims the author make are valid [1]

   Also at this time you can begin to take note of areas that you think could be improved upon. (i.e. a future research project)

6 What to Take Away

Once you read an article fully the best thing to do is to write up a paper review. This will allow you to cement the ideas presented in the paper, and allow you

to put in writing any ideas that you may have thought of while reading.

To write a review, a researcher should split the review into three sections: first a summary, second an evaluation of the work itself, third areas you think can be improved upon or ideas that you may have. (possible future works)

7   Misc Tips

Don't let a paper's grammar or awkward phrasing throw you off. Many times a researcher that is writing a paper did not learn English as a first language. So if you encounter such a paper, take a second to understand the phrasing of the author as opposed to just discarding it. This can help you discover very valuable research done by someone who simply doesn't have an expert writing ability.

Keep a bibliography of papers that you found to be significant. With every bib entry that you make, write a brief summary of what the paper was about. This is so in the future if you need to cite someones work you can refer to your bibliography instead of searching databases.

8   Conclusion

Reading has a very significant role in research. Without it research would not be able to proceed in an organized manner. Through reading we are able to determine what others are working on, and what questions still remain in the field. Simply knowing how to be an efficient reader will not make a researcher good, but not knowing how to read papers could potentially make a researcher's research bad. Think about these things as you become a researcher in Computer Science.

References

[1] Philip W. L. Fong. How to read a cs research paper, 2013.

[2] Amanda Stent. How to read a computer science research paper.