

How to Read a CS/EE Research Paper?

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What will be covered in this seminar?

- In this seminar, we will discuss the following:
 - ⇒ Structure of a CS/EE Research Paper
 - ⇒ Two-Phase Paper Reading
 - ⇒ What do you need to retain?
 - ⇒ Exercises

Before we begin....

- ❑ How many of you did a Google search on this topic?

Before we begin....

Google [Advanced Search](#) [History](#)

Search: the web pages from Pakistan

Web Results 1 - 10 of about 28,400,000 for [how to read a research paper](#). (0.8

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[How to Read a Scientific Research Paper](#) -
A guide on how to critically read a scientific research paper, one of the key components of the scientific method.
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How to Read an Engineering Research Paper. William G. Griswold CSE, UC San Diego. Reading research papers effectively is challenging....
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Some tips for reading research papers. Read the paper 3 times. First read the abstract, the introduction and the conclusion and look through the references....
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[How to read a paper: Papers that go beyond numbers \(qualitative...\)](#)
How to read a paper: Papers that go beyond numbers (qualitative research). Trisha Greenhalgh, senior lecturer, a Rod Taylor, senior lecturer b...
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The ability to answer the following questions after you have read a research article... either a journal article or a conference paper... is an important...
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CSC18962 Mobile robotics, Spring 2001. How to read a research paper. Research papers tend to follow a certain form; for the uninitiated, this may take...
[www.cs.spl.edu/academics/courses/spring01/mobile-robotics/handouts/reading.ps](#) - [Similar pages](#) - [↵](#)

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read a research paper, for example, the fact that I assign a paper is (probably) a good... When you read a research paper, your goal is to understand...
[www-top.jinliao.plane.le/Amoual.Legout/Documents/Read Paper.ps](#) - [Similar pages](#) - [↵](#)

Before we begin....

- ❑ There are many extremely well-written articles on this topic on the Internet

- ❑ In particular, I found the following articles useful:
 - Gail Murphy and Bill Griswold. How to Read an Engineering Research Paper, <http://www.cs.ubc.ca/~murphy/cpsc507/winter02/documents/reading-eval.htm>
 - Philip W. L. Fong, How to Read a CS Research Paper? <http://www2.cs.uregina.ca/~pwlifong/CS499/reading-paper.pdf>
 - Spencer Rugaber, How to Read a Research Paper, www.cc.gatech.edu/fac/Spencer.Rugaber/txt/research_paper.txt.

- ❑ All the views expressed in this talk have been personally beneficial to me
 - ⇒ This does not necessarily imply that they will also work for you ☹️

Structure of a Typical CS/EE Research Paper

Typical Paper Structure

- ❑ Abstract
- ❑ Introduction
- ❑ Related Work
- ❑ Background
- ❑ System Model
- ❑ Contribution
- ❑ Performance Evaluation
- ❑ Conclusions
- ❑ References

Typical Paper Structure

□ Abstract

⇒ Describing the main idea/proposed solution of the paper in a few words

□ Introduction

⇒ Expands the abstract, also discusses:

- Limitations of existing work
- How the proposed solution has been evaluated

□ Related Work

⇒ What has already taken place in this area? And how is this paper different?

□ Background

⇒ Optional: Used if concepts from a different domain are used

Typical Paper Structure

- ❑ System Model
 - ⇒ The basic system-level model and assumptions

- ❑ Contribution
 - ⇒ One or two sections describing the contributions of the work

- ❑ Performance Evaluation
 - ⇒ Performance comparison with existing work

- ❑ Conclusions
 - ⇒ Salient findings

- ❑ References

Two-Phase Paper Reading

Before reading the paper, ask yourself....

... how much do I already know about this area?

If you know a lot, then skip the next slide and proceed to the two-phase paper reading process

Otherwise:

- ⇒ Read about the area on Wikipedia
- ⇒ Read other less-technical online articles about the area: news websites, ZDNet, CNET, etc. are good resources
- ⇒ Download and **read tutorial/survey/white papers** on the subject: It may or may not be directly relevant to the area that you are interested in
- ⇒ Finally, proceed to reading more advanced technical articles

Before reading the paper, remember....

... everything written and presented in the paper is connected!

Well, at least if it is published in a decent conference/journal

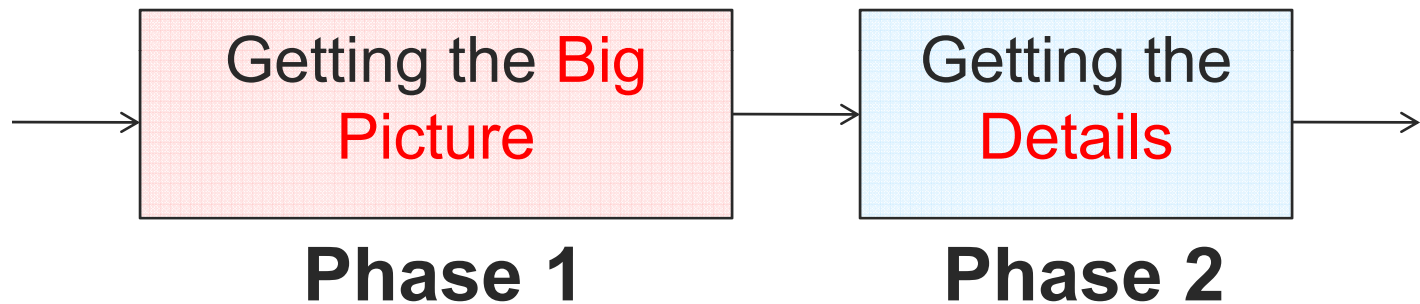
More specifically:

- ⇒ Every sentence leads to another sentence
- ⇒ Every paragraph is connected to the next
- ⇒ Every section flows into another paper
- ⇒ Every figure is there for a reason

But remember:

- ⇒ The authors are generally constrained for space, so everything is condensed
- ⇒ In the start, you will have to refer to other sources (references) for details

Two-Phase Paper Reading



Phase 1: Getting the Big Picture

- ❑ Read the Abstract and Introduction carefully
- ❑ Skim through the rest of the paper
 - ⇒ Pay special attention to results (tables, figures, etc.) and discussions on results

Phase 1: Getting the Big Picture - Abstract

What problem is the paper trying to solve?

- ❑ Highlight a maximum of two to three sentences
- ❑ Never mind the contribution

Phase 1: Getting the Big Picture - Introduction

1. **What problem is the paper trying to solve?**
 - Highlight three to four lines
2. **What are the limitations of prior work?**
 - Highlight maximum two to three lines
3. **How is the problem solved by this paper?**
 - What is the paper's contribution?
 - Highlight three to five lines
4. **How is the proposed solution evaluated?**
 - What kind of data/experiments were conducted?
 - No need to highlight anything; you can highlight two to three words here

Phase 2: Getting the Details – System Model and Contribution

1. What problem is the paper trying to solve?
2. Read the System Model carefully
 - The whole paper is going to be based on this model
3. Understand the gist of the contribution/proposal
 - Does it make sense?
 - Do you think it will work?
 - How will the proposal be evaluated?
4. Don't try to read all the math in one go
 - Read the assumptions and system model
 - Try to work out a solution to the problem

Phase 2: Getting the Details - Evaluation

1. Is the evaluation fair and comprehensive?

- Try to find the next paper you want to read from this section

2. Understand the results

- Do not miss a single figure and table
- Find the corresponding discussions in the paper and read them thoroughly

What do you need to retain?

What to retain?

1. The problem
2. The basic idea of the proposed solution
3. Your personal notes on the paper's mathematics
4. Shortcomings of the proposed approach

Also, ask yourself....

- ❑ What is the message you take away from this paper?

- ❑ Are you convinced that the paper attempted an important problem?
 - ⇒ If your answer is NO, Justify it!

- ❑ Are you convinced that the paper proposed a viable solution?
 - ⇒ If your answer is NO, Justify it!

- ❑ What questions still remain unanswered?

Exercises

Answer these questions:

1. What problem is the paper trying to solve?
2. What are the limitations of prior work?
3. How is the problem solved by this paper?
4. How is the proposed solution evaluated?