How to read a paper

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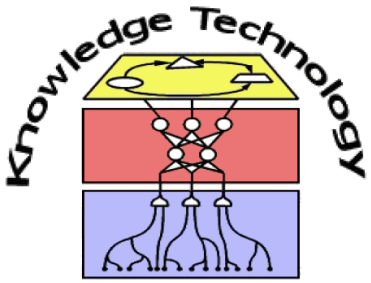

http://www.informatik.uni-hamburg.de/WTM/

Goals of this introduction

- Maximize benefits obtained from reading a scientific paper (or similar document)
  - Organize reading process
  - Set clear goals

- Presentation (very closely) follows:
  - M. J. Hanson, D. J. McNamee,
    “Efficient Reading of Papers in Science and Technology”,
    http://www.cs.columbia.edu/~hgs/netbib/efficientReading.pdf
  - With material of Prof. H. Karl, Universität Paderborn

Why read?

- What is the reason causing you to read a specific document?
  - Need an overview?
  - Need to present it to others?
  - … don't know?
- Why read a specific paper?
  - What did the authors do? Look at title, abstract
  - Read, file for later, drop it

Reading for breadth

If you decide to read the paper, first skim it:

- Read the introduction.
- Read the section headings.
- Look at the tables and graphs to see what they say and read the captions.
- Read the definitions and theorems.
- Read the conclusions.

Reading for breadth (cont.)

- Consider the credibility of the article
  - Who wrote it? Are they well-known? Where do they work?
  - Where was the article published? What is the reputation of the journal? Was the journal refereed?
  - When was it written? Might it be outdated or superseded?
- Skim the bibliography
  - How extensive is it?
  - Are the authors aware of current related work?
  - Does it refer to classic work in this field?
  - Have you read any of the papers that are referred to?

Reading for depth

There's a lot of material published! Try to critically analyze!

- Examine the assumptions
  - Do their results rely on any assumptions about trends or environments?
  - Are these assumptions reasonable?
- Examine the methods
  - Did they measure what they claim?
  - Can they explain what they observed?
  - Did they have adequate controls?
  - Were tests carried out in a standard way?

Reading for depth (cont.)

- Examine the methods
  - Were appropriate methods applied properly?
  - Did they do proper error analysis?

- Examine the conclusions
  - Do the conclusions follow logically from the observations?
  - What other explanations are there for the observed effects?
  - What other conclusions or correlations are there in the data that they did not point out?

Challenge what you read!

Taking Notes

- Make notes as you read
  - Highlight major points
  - Note new terms and definitions
  - Summarize tables
  - Construct your own examples
  - Write a summary – relate it to what you already know
  - Write a short critique – note drawbacks and gaps
- Organize your note taking
  - Put all notes in a consistent place
  - Link your notes with bibliographic information about a paper
    - E.g., put notes into a BibTeX, EndNote, JabRef, Citavi, etc. entry for each paper

Finding out what to read

- Main sources of information: Refereed conferences/journals
- Secondary: Textbooks
- Secondary: Search engines specialized to academic topics

- Useless or severely limited sources: Web, Wikipedia, …
  - Quality is sometimes decent, often appalling

- Which conferences/journals?
  - Depends on the branch of knowledge you are interested in
  - For knowledge technology, see: http://www.informatik.uni-hamburg.de/WTM/links.shtml

Summary

- Prepare the reading
- Decide what to read
- Read for breadth
- Read for depth
- Take notes

The End

Thank you for your attention.

Any question?

Literature:

- M. J. Hanson, D. J. McNamee. *Efficient Reading of Papers in Science and Technology*, 2000, http://www.cs.columbia.edu/~hgs/netbib/efficientReading.pdf.
- G.D. Spache, P.C. Berg. *The art of efficient reading*. Macmillan Coll Div, 1984.

Recommended search engines for scientific publications:

- ACM: http://portal.acm.org/dl.cfm?coll=portal&dl=ACM
- IEEE: http://ieeexplore.ieee.org/Xplore/dynhome.jsp?tag=1
- At least better than Google: http://scholar.google.de/