How to Read and Present a Scientific Paper

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Thanks to Emmanuel Fleury for providing his slides.

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Motivations

Why to Read Scientific Papers?

[Academic World]

I read papers because of:

- **The Content:**
  Looking for new ideas or new techniques to write a new paper

- **The Topic:**
  What are the new directions in my field or learning a new topic

- **The Authors:**
  Looking for valuable colleagues to work with or new comers
Motivations

Why to Read Scientific Papers?

[Company World]

I read papers because of:

- **The Content:**
  
  I need the most efficient algorithm or new techniques for my product

- **The Topic:**
  
  Can I get a new product out of these crazy scientists work?

- **The Authors:**
  
  Who are the valuable persons to hire or collaborate with?
Motivations

What should I learn?
I already know how to read English!

It is cryptic
(notations, terminology, math formulas, information dense, references to other papers, ...)

It is hidden
(where to find good papers?)

It is complex
(theorems, proofs, algorithms, experiments, ...
Plan

1. Taxonomy of Scientific Papers
2. Structure of Scientific Papers
3. First Read Through
4. In Depth Reading
5. Looking at References
6. Evaluating Scientific Papers
Taxonomy of Scientific Papers

- Trust

- Research Reports
  - Workshop Papers
  - Conference Papers
  - Journal Papers
Taxonomy of Scientific Papers

Research Reports

Review: None
Goal: Stamp an idea before publishing
Size: Depends
Freshness: Instantaneous

Workshop Papers

Review: Yes, but low threshold
Goal: Either submit “in progress” work and hoping for feedback,
or the paper has been rejected to a conference
Size: Few pages (from 5 to 15)
Freshness: From few weeks to few months
Taxonomy of Scientific Papers

Conference Papers

Review: Yes, the threshold depends on the conference
Goal: Publish a finished work with possible forthcoming research
Size: More than 8 pages and less than 20
Freshness: Few months

Journal Papers

Review: Yes, the threshold depends on the journal (international experts are reviewing)
Goal: Survey or complete work on a topic (in depth paper)
Size: From 15 pages up to 70 (or more)
Freshness: Few months to few years

Ranking of outlets: by acceptance rate, by citation rate, by reputation
Structure of Scientific Papers

- Abstract (2.5%)
- Related Work (2.5%)
- Introduction (10%)
- Preliminaries (20%)
- Body (50%)
- Conclusion (5%)
- References (10%)
First Read Through (Step 1)

1. Read:
   - Abstract
   - Introduction
   - Related Work
   - Conclusion
   - References (Only the one pointed in one of the previous sections)

2. Reply to the following questions:
   - For which community is the paper written? [Introduction, Related Work]
   - What contributions are in this paper (according to the authors)? [Abstract, Introduction, Conclusion]
   - What possible consequences can the contributions have? (direct applications, new techniques, new fields, . . .) [Introduction]
First Read Through (Step 2)

1. Read:
   - Preliminaries (Identify the notations, theories or analysis methods)
   - Body (Warning! Do NOT read the proofs or experiment settings)

2. Reply to the following questions:
   - If I assume the proofs correct or the experimental setting and the analysis method relevant, does the authors meet the list of contribution? [Preliminaries, Body]
     - Yes: Go to “In Depth Reading”
     - No: Try again or ask for advice by your supervisor
In Depth Reading

1. Read:
   - **Body** (Everything)
   - **References** (Quick glance to external theorems/experiments)

2. Last Tips:
   - A proof/experiment is too technical, I do not understand it!
     - Is it relevant to understand it?
       - **Yes**: Try harder, read background material, or contact your advisor
       - **No**: Skip it

   - I found an error!
     - Are you sure?
       - Double check
       - Triple check
       - Ask your advisor

     - Are the contributions of the paper still valid?
       - **Yes**: Then, it is not so important
       - **No**: Write a paper!
Looking at References

A paper is just one link in a chain!
Don’t stop once you have read it, it’s only the beginning!

Looking at references allows you to:
• Discover the community around it
• Understand the context
• Put the paper in perspective
• Link it with other fields/topics
Testing real-time embedded software using UPPAAL-TRON: an industrial case study - all 2 versions
ABSTRACT UPPAAL-TRON is a new tool for model based online black-box conformance testing of real-time embedded systems specified as timed automata.
In this paper we present our experiences in applying our tool and ...
Cited by 3 - Related Articles - Web Search - Import into BibTeX

Online Testing of Real-time Systems using Upgoa: Status and Future Work - all 2 versions
K Larsen, M Mikucionis, B Nielsen - Dagstuhl Seminar Proceedings - drop.dagstuhl.de
Abstract. We present the development of TU UPPAAL — a new tool for online black-box testing of real-time embedded systems from non-deterministic timed automata specifications. It is based on a sound and complete randomized ...
Cited by 2 - Related Articles - View as HTML - Web Search - Import into BibTeX

Random testing of interrupt-driven software - all 4 versions
ABSTRACT Interrupt-driven embedded software is hard to thoroughly test since it usually contains a very large number of executable paths. Developers can test more of these paths using random interrupt testing—fire random ...
Cited by 2 - Related Articles - Web Search - Import into BibTeX

Interface Input/Output Automata Splitting Assumptions from Guarantees - all 4 versions
RG Larsen, U Nyman, A Wojtowicz, Hermanns et al [8] - von anu.dk
There are two main contributions of the work. First, we explicitly separate assumptions from guarantees, increasing the modeling power of the specification lan- guage and demonstrating an interesting relation between blocking and ...
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Automated test generation from timed automata

Journal
International Journal on Software Tools for Technology Transfer (STTT)

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Special section on trends in verification and validation

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55-77

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Computer Science

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Search Results

1. Automated test generation from timed automata

Title
Automated test generation from timed automata

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Abstract
Testing is the most dominant validation activity used by industry today, and there is an urgent need for improving its effectiveness, both with respect to the time and resources for test generation and execution, and

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Evaluating Scientific Papers

Ok, I have:

- Read the paper,
- Understood it,
- Browsed the references.

What’s next?

- List the strength/weakness of the paper (be critical!)
- Define the contributions of the paper (look at the papers quoting it)
- Put the paper in perspective (impact on the community)
- Make your own opinion! (very important)
Summary: How to Read a Paper?

1. **First Read Through**
   (Abstract, Introduction, Related Work, Conclusion, References)
   Extract the context and the intended contributions

2. **In Depth Reading**
   (Preliminaries, Body, References)
   Grab the details

3. **Looking at References**
   (References, Google Scholar)
   Make the link with other papers, look at the real impact

4. **Evaluate the Paper**
   (Everything)
   Make your own opinion

5. **Start to Prepare your Presentation**
Part II:
Presenting a Scientific Paper
Plan

1. Before You Start
2. Organize your Ideas
   - Introduction
   - Preliminaries
   - Body
   - Technicalities
   - Conclusion
3. Slides
4. Speaking
5. The “Show”
6. Last Tips
Before You Start

Know your Topic
(Be sure you have understood the paper)

Know Your Audience
(Your talk must take the audience into account)

Know Your Goals
(What are the expectations of the audience?)

Know Your Limits
(how much time will be needed?)
Organize Your Ideas (1/3)

- **Identify the Key Ideas**
  (Make sure that all the key ideas of the paper are in your talk)

- **Do not Go into too Many Details**
  (Ignore the superfluous and focus on the essentials, *use examples!*)

- **Use A Top-Down Approach**
  (starting wide, finishing narrow)

- **Structure Your Talk**
  Introduction, Preliminaries, Body, Technicalities, Conclusion)
Organize Your Ideas (2/3)

Introduction

- Define the Problem
- Motivate the Audience
- Discuss Earlier/Posterior Work (briefly)
- Emphasize the Contribution of the Paper
- Provide a Road-map

Preliminaries

- Introduce Terminology and Notations or the Setting of the Experiment (but only the absolutely necessary ones)
- If Needed, Redefine the Problem more Technically
Body

Organize Your Ideas (3/3)

Conclusion

Indicate that Your Talk is Over
Explain Your Opinions on the Paper
Remind the Main Results

Technicailites

Give some Examples
Explain the Meaning of the Results
List Major Results

Proof sketch, algorithm, implementation details, experimental results

List Major Results
Slides

- Use them: computerized, printed or handwritten slides
- The Simpler, the Better!
  (do not put the whole sentences you want to say on slides)
- Use Colors!
  (but don’t exaggerate !)
- Use Pictures
  (one picture is worth thousands of words)
- One Slide = 1–3 minutes (average)
  (think about timing)
Speaking

- **Speak Slowly, Steadily and Loud**
  (do not speak mentally, something to drink, avoid bubbles)

- **Find the Right Words**
  (prepare some full sentences to say during the talk)

- **Transitions are the Keys**
  (prepare transition between slides)

- **Improvisation is Needed**
  (whatever you do, you will have to improvise)

- **Humour is OK but not Recommended**
  (do not try to be funny!)
The Show

- **Do not be monotonous**  
  (try to make your voice vary slightly)

- **Make the Audience Participate**  
  (depends on the type of talk)

- **Maintain Eye Contact**  
  (don’t show them your back)

- **Control Your Position**  
  (don’t hide the slides)

- **Control Your Timing**  
  (do not forget the time)

- **I made a Mitsake... The Show Must Go On**
Last Tips

Practice!

Practice!

Practice!

Practice!