

Computer Vision
and Geometry Lab

How to Read and Present Scientific Papers

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Scientific papers

Original research, before it is being interpreted
and re-written by other media!

Motivations: Why to read scientific papers?

Academic World

1. [Content] Looking for new ideas or new proof techniques to write a new paper;
2. [Topic] What are the new directions in my field or learning a new topic?
3. [Authors] Looking for valuable colleagues to work with or new comers.

Modified from Jiri Srba's Slides


Motivations: Why to read scientific papers?

Industry World

1. [Content] Looking for the most efficient algorithm or new techniques for my product;
2. [Topic] Can I get a new product out of these crazy scientists' work?
3. [Authors] Who are the valuable persons to hire or collaborate with?

Modified from Jiri Srba's Slides

Initial assessment: Type of publication

- Peer-reviewed?
- High-impact journal / conference?
- Importance of these criteria is decreasing in ML field
 - "Self-publication" on  arXiv.org
 - Distribution via twitter etc.

- Highly cited?

[Imagenet classification with deep convolutional neural networks](#)

[A Krizhevsky, I Sutskever, GE Hinton - Advances in neural ..., 2012 - papers.nips.cc](#)

We trained a large, deep convolutional neural network to classify the 1.3 million high-resolution images in the LSVRC-2010 ImageNet training set into the 1000 different classes.

On the test data, we achieved top-1 and top-5 error rates of 39.7% and 18.9% which is ...

☆   **Cited by 56790** [Related articles](#) [All 133 versions](#) [Web of Science: 14943](#) 

Structure of scientific paper

1. Abstract
2. Introduction
 - Context and motivation
 - Related work
 - Main contributions
3. Method
4. Experiments
5. Conclusion
6. References

How to read a paper

1. Quick assessment (publication type, authors ...)
2. First reading (skim)

First reading

Can I get what I need from this paper?
(Should I spend time on it?)

- Abstract, introduction
- Conclusion (if you want a specific question answered)
- Glance over methods (if you're familiar with the field)
- Glance over results (if you're looking for results)

Should be able to identify main contributions
and potential significance

How to read a paper

1. Quick assessment (publication type, citations, authors ...)
2. First reading (skim)
3. Second reading (in depth)

In depth study

- Read everything closely
- Check out references
- Familiarize with mathematical notation (if applicable) and technique details
- Overcoming challenges (e.g. equations):
 - Try to understand
 - If not: understand if it's relevant to understand it
 - Find answers online – normally not possible!
 - Discuss with tutor

In depth study: Strengths and weaknesses

- Does the paper deliver what it sets out to do?
- Experimental setup
- Mathematical rigour
- Novelty / importance of contributions

In depth study: Additional material

You might check out

- Appendix
- Project website for supplementary material
 - Videos, slides, etc
 - Code

In depth study: Significance of paper

- Identify from paper itself

- Citations (<http://scholar.google.com>) 

- Web search



Example of CVPR reviews

How to present a paper: Content

- Roughly follow the structure of the paper (except abstract)
 - Introduction
 - Motivation / problem setting / status quo
 - Main contributions and their significance
 - Body
 - Overview of method and relevant results (+interpretation)
 - Discussion
 - Include impact of the work on the research field
 - You may include your own opinion of the paper

How to present a paper: Tips

- Present to your audience
 - Some knowledge of machine learning, no specialised knowledge in the area of your paper
- Intuitive explanation, not too many details
 - Use equations sparingly (but do so if necessary)
- Distill and emphasise the key elements of the paper
- Do not crowd your slides, use illustrations generously

Example of presentation

After the presentation..

Questions and discussion

- Questions about talk content (spontaneous)
- Prepared questions from "critics"
 - Based on their study of the paper
 - "Could this also be applied to.."
 - "What's the difference between this method and .."
 - "I think the experiment setup is flawed because..
What do you think?"

Summary

Use the provided guidelines for studying the papers

Please prepare for the seminar even if you will not be evaluated on that day!