

Computer Vision  
and Geometry Lab

# How to Read and Present Scientific Papers

Zhaopeng Cui

18 February 2018

For slides credits we thank Lisa Koch.

# 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 latter 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 35695 Related articles All 101 versions 

# Structure of scientific paper

1. Abstract

2. Introduction

- Context and motivation
- Related work
- Main contributions

3. Method

4. Experiments

5. Conclusions

6. References

# How to read a paper

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

# 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



# In depth study

- Read everything closely
- Check out references
  
- Familiarise with mathematical notation (if applicable)
- 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
- Author website for supplemental material
  - Videos, slides, etc
  - Code

# In depth study: Significance of paper

- Identify from paper itself

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



- Web search



# 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

# 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!