Paper writing

Kasper Stoy, 2012
University of Tarapacá, Chile

SCIENTIFIC PUBLICATION IN PRACTICE LECTURE 3

Overview

- Paper writing

Motivation

- You got scientific results, how do you present them to a scientific audience?
- Inspire you to enjoy the art of paper writing!

I don’t write English

- Start today with help of
  - Dictionary and grammar books
  - Colleagues
  - Copy-editor (professional)
  - Proof-reader (professional)
- Never start
  - Technical translator (professional)

How to write a paper?

Paper writing

- An art!
- Easy to learn difficult to master!
- Only guidelines can be given

Title is most important!

- Most people will only read the title!
- Find a good, concrete title and the rest of the paper will write itself!
- Difficult to write:
  - “Study of friction in robots”
- Easy to write:
  - “Friction uses 30% of energy in robots”

The title needs a message!

- Based on your result and existing literature decide on a **message**
- Bad example:
  - “Feasibility of applying active lubrication to dynamically loaded journal bearing”
    - Edgar A. Estupiñan et al.
- What is the message?
- Do you want to read it?!??

Titles with messages

- Aggressive alternative:
  - “Active lubrication reduces friction of dynamically loaded journal bearing”
- Defensive alternative:
  - “Active lubrication may reduce friction of dynamically loaded journal bearing”
- Super defensive alternative:
  - “Active lubrication may reduce friction of dynamically loaded journal bearing, model suggests”

The good title

- Describe topic
- Has message
- Active wording
- Important information first
- Precise
- Short

- Example:
  - “Active lubrication reduces friction of dynamically loaded journal bearing”

Good title?

- Are these good? (Prof. Mendoza et al.)
  - *“A vacuum-based bonding mechanism for modular robotics”*
  - *“On the Efficiency of Local and Global Communication in Modular Robots”*
  - *“Reusable Electronics and Adaptable Communication as Implemented in the Odin Modular Robot”*
- Checklist: describe topic, has message, active wording, Important information first, precise, short

Journalists make good titles!

- Learn from journalists (New York Times):
  - U.S. Economic Growth Slows to 2.2% Rate, Report says
  - U.S. Sees Positive Signs From China on Security Issues
  - Blind Activist Escapes House Arrest in China
- Checklist: describe topic, has message, active wording, Important information first, precise, short

Contents of a paper (Typical)

1. Title
2. Author list
3. Abstract
4. Introduction
5. Related work
   - May work better after methodology
6. Methodology
7. Experiments
8. Discussion
9. Conclusion
10. References

Authors

- Roles in publication
  - Master's students / Ph.D. students perform most of the research work
  - Student writes most papers
  - Professors mostly provide feedback, but sometimes write key articles

Key to understanding author list

- First author did the work and the writing!
- Last person provided feedback and funding.
- The second author helped the first author in some way
- The rest minor roles, but work towards their curriculum vitae

Author list: Transition to independence

- Advantage for both student and professor
- However, as student gain status the professor becomes an obstacle to establish own name - transition

Beginning of the paper

- Same content, different formats:
  - Title
  - Abstract
  - Introduction

Abstract

- Dense text (unfortunately)
- Targeted at a broad audience
  - Example roboticists
- Contains:
  - Introduction (hypothesis)
  - Methodology
  - Experiments
  - Conclusion

Introduction

- Easily accessible text
- Target as broad an audience as possible
  - Some people only read this and the conclusion
- Watch out for technical language!
- Contains:
  - Introduction (hypothesis)
  - Methodology
  - Experiments
  - Conclusion

Related work section

- Goals
  - Tell the reader about relevant work, be a tour guide
  - Differentiate your work from that of others
  - Demonstrate awareness of related work

Awareness

- Imagine a tree of research
  - The description of which began in the introduction
- Guide the reader through the tree
  - Describe main trunk (key papers)
  - Describe alternative branches to yours
  - Describe your branch
- Not defensive or aggressive! You are just providing a map

Differentiation

- Describe what sets your approach apart
  - “Novel”, “Contribution”
- Describe advantages and **disadvantages**
- Be positive describing related work
  - Reviewer may be author

Method/Approach/Theory

- Describe the theory and key methodologies you use!
- Write as easy to understand as possible

Implementation/Experiments

- Easy part!

Discussion

Stay at a high level, avoid “details”

- How does experiments support hypothesis/message of paper
- Alternative explanations of results
- Suggest improvements to experiments

Provide perspective to your work

- Example future work

Conclusion

- Write itself!
- Reiterate message/hypothesis of paper together with supporting results
- Contains
  - Introduction
  - Methodology
  - Experiments
  - Conclusion

References/Literature list

- Make proper citations, may be reviewers papers!
- Conference: J. K. Author, “Title of paper,” in *Unabbreviated Name of Conf., City of Conf., Abbrev. State (if given), year, pp. xxx-xxx.*
- *Journal:* J. K. Author, “Name of paper,” *Abbrev. Title of Periodical, vol. x, no. x, pp. xxx-xxx, Abbrev. Month, year.*
- If unsure:
  - Consult “IEEE Citation Reference” (find by typing into google)
  - The mother source:“Chicago Manual of Style”

Comments and questions

ksty@itu.dk

THANK YOU AND GOOD LUCK!