Scientific Writing, Integrity and Ethics II

Scientific Writing in CS

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References

Norman Ramsey. Learn technical writing in two hours per week.
http://www.cs.tufts.edu/~nr/pubs/two.pdf

Simon Peyton Jones. How to write a great research paper.
https://www.microsoft.com/en-us/research/academic-program/write-great-research-paper/

Derek Dreyer. How to write papers so people can read them. PLMW@POPL 2016

A Question

How many people do you think will read your paper?

A Survey as well as a Structure

Title

Title (1000 readers)

Title (1000 readers)

Abstract

A Survey as well as a Structure

Title (1000 readers)

Abstract (1-2 paragraphs, 200 readers)

A Survey as well as a Structure

Title (1000 readers)

Abstract (1-2 paragraphs, 200 readers)

Introduction

A Survey as well as a Structure

Title (1000 readers)

Abstract (1-2 paragraphs, 200 readers)

Introduction (1-2 pages, 100 readers)

A Survey as well as a Structure

Title (1000 readers)

Abstract (1-2 paragraphs, 200 readers)

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The problem/My ideas

A Survey as well as a Structure

Title (1000 readers)

Abstract (1-2 paragraphs, 200 readers)

Introduction (1-2 pages, 100 readers)

The problem/My ideas (2-3 pages, 20 readers)

A Survey as well as a Structure

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Abstract (1-2 paragraphs, 200 readers)

Introduction (1-2 pages, 100 readers)

The problem/My ideas (2-3 pages, 20 readers)

Technical details

A Survey as well as a Structure

Title (1000 readers)

Abstract (1-2 paragraphs, 200 readers)

Introduction (1-2 pages, 100 readers)

The problem/My ideas (2-3 pages, 20 readers)

Technical details (4-6 pages, 5 readers)

A Survey as well as a Structure

Title (1000 readers)

Abstract (1-2 paragraphs, 200 readers)

Introduction (1-2 pages, 100 readers)

The problem/My ideas (2-3 pages, 20 readers)

Technical details (4-6 pages, 5 readers)

Related work

A Survey as well as a Structure

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Abstract (1-2 paragraphs, 200 readers)

Introduction (1-2 pages, 100 readers)

The problem/My ideas (2-3 pages, 20 readers)

Technical details (4-6 pages, 5 readers)

Related work (1-2 pages, 100 readers)

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Introduction (1-2 pages, 100 readers)

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Technical details (4-6 pages, 5 readers)

Related work (1-2 pages, 100 readers)

Conclusions and further work

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Introduction (1-2 pages, 100 readers)

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Related work (1-2 pages, 100 readers)

Conclusions and further work (0.5 pages, 0 readers)

Before we go into the details, we have...

Three Suggestions

1. Don't Wait, Just Write

Usually,

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Your idea $\Longrightarrow$ Do research $\Longrightarrow$ Write paper

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Your idea $\Longrightarrow$ Do research $\Longrightarrow$ Write paper

Suggested,

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Usually,

Your idea $\Longrightarrow$ Do research $\Longrightarrow$ Write paper

Suggested,

Your idea $\Longrightarrow$ Write paper $\Longrightarrow$ Do research

Scientific Writing is a part of research!

Advantages

Forces us to be clear, focused

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Crystallises what we don't understand

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Writing papers is a primary mechanism for doing research (not just for reporting it)

2. Identify Your Key Idea

Convey an Idea

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Your goal: to convey a useful and re-usable idea.

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The greatest ideas are (literally) worthless if you keep them to yourself.

You need to have a fantastic idea...

Firstly...

You need to have a fantastic idea...

Write a paper, and give a talk, about any idea, no matter how weedy and insignificant it may seem to you.

Your paper should have just one “ping”:

About the Idea

Your paper should have just one "ping": one clear, sharp idea.

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You may not know exactly what the ping is when you start writing; but you must know when you finish.

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Your paper should have just one "ping": one clear, sharp idea.

You may not know exactly what the ping is when you start writing; but you must know when you finish.

If you have lots of ideas, write lots of papers.

Many papers contain good ideas, but do not distil what they are.

Many papers contain good ideas, but do not distil what they are.

Make certain that the reader is in no doubt what the idea is. Be 100% explicit:

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- "The main idea of this paper is..."

Many papers contain good ideas, but do not distil what they are.

Make certain that the reader is in no doubt what the idea is. Be 100% explicit:

- "The main idea of this paper is..."
- "In this section we present the main contributions of the paper."

3. Tell a Story

The Flow

Imagine you are explaining at a whiteboard

Imagine you are explaining at a whiteboard

- Here is a problem

Imagine you are explaining at a whiteboard

- Here is a problem
- It's an interesting problem

Imagine you are explaining at a whiteboard

- Here is a problem
- It's an interesting problem
- It's an unsolved problem

Imagine you are explaining at a whiteboard

- Here is a problem
- It's an interesting problem
- It's an unsolved problem
- Here is my idea

Imagine you are explaining at a whiteboard

- Here is a problem
- It's an interesting problem
- It's an unsolved problem
- Here is my idea
- My idea works (details, data)

The Flow

Imagine you are explaining at a whiteboard

- Here is a problem
- It's an interesting problem
- It's an unsolved problem
- Here is my idea
- My idea works (details, data)
- Here's how my idea compares to another people's approaches

Repeat the Story from Time to Time

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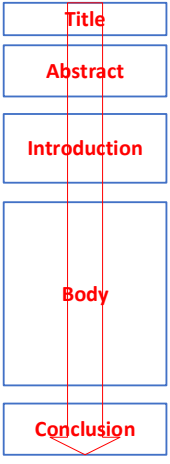
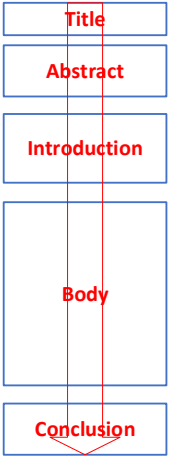
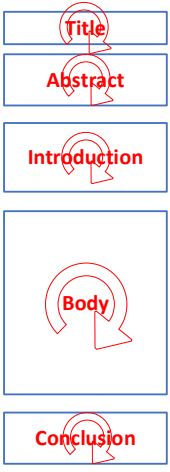


Repeat the Story from Time to Time





Kick off for Academic Writing

Now, we begin to organize an academic paper...

The Structure, Revisited

Title

Abstract (1-2 paragraphs)

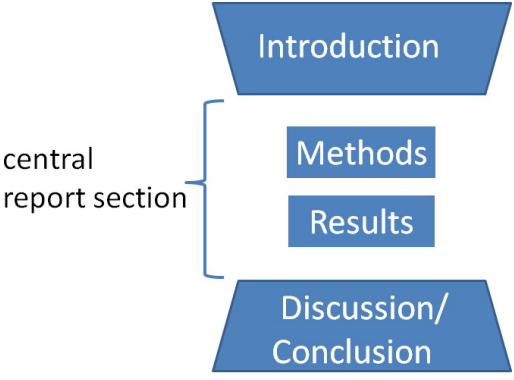
Introduction (1-2 pages)

The problem/My ideas (2-3 pages)

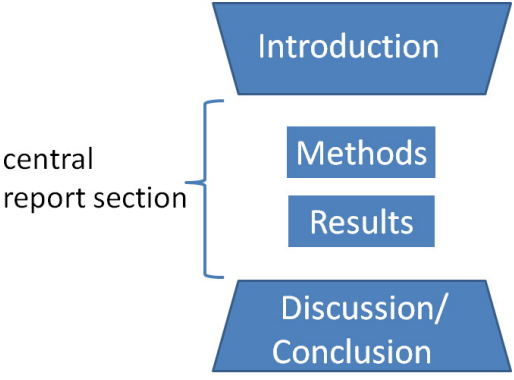
Technical details (4-6 pages)

Related work (1-2 pages)

Conclusions and further work (0.5 pages)



https://en.wikipedia.org/wiki/IMRAD



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by *Louis Pasteur (1822-1895)*

Introduction:

- Why was the study undertaken?
- What was the research question, the tested hypothesis or the purpose of the research?

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Methods:

- When, where, and how was the study done?
- What materials were used or who was included in the study groups (patients, etc.)?

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- What answer was found to the research question; what did the study find?
- Was the tested hypothesis true?

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Methods:

- When, where, and how was the study done?
- What materials were used or who was included in the study groups (patients, etc.)?

Discussion:

- What might the answer imply and why does it matter?
- How does it fit in with what other researchers have found?
- What are the perspectives for future research?

The Structure

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Related work (1-2 pages)

Conclusions and further work (0.5 pages)

Criterion for Title

The title should accurately, clearly, and concisely reflect the emphasis and content of the paper.

The title must be brief and grammatically correct.

The Structure

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Abstract (1-2 paragraphs)

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Context

- Set the stage, motivate the general topic

Gap

- Explain your specific problem and why existing work does not adequately solve it

Innovation

- State what you've done that is new, and explain how it helps fill the gap

An Abstract: Context

Learning to write well is an essential part of becoming a successful researcher.

An Abstract: Gap

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Unfortunately, many researchers find it very hard to write well because they do not know how to view their text from the perspective of the reader.

An Abstract: Innovation

Learning to write well is an essential part of becoming a successful researcher. Unfortunately, many researchers find it very hard to write well because they do not know how to view their text from the perspective of the reader. In this talk, we present a simple set of principles for good writing, based on an understanding of how readers process information. Unlike such platitudes as "Be clear" or "Omit needless words", our principles are constructive: one can easily check whether a piece of text satisfies them, and if it does not, the principles suggest concrete ways to improve it.

Like an expanded version of the abstract.

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Alternative approach: Eliminate Context

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- Start with a concrete example, e.g. “Consider this Haskell code. . . ”

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Alternative approach: Eliminate Context

- Start with a concrete example, e.g. "Consider this Haskell code..."
- If this works, it can be effective, but I find it often doesn't work.

Like an expanded version of the abstract.

Alternative approach: Eliminate Context

- Start with a concrete example, e.g. "Consider this Haskell code..."
- If this works, it can be effective, but I find it often doesn't work.
- It assumes reader already knows context.

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My Ideas as Illustration

Use concrete illustrative examples and high-level intuition.

Do not have to show the general solution.

Why This Section

Forces you to have a “takeaway”.

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Many readers only care about the takeaway, not the technical details.

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For those who want the technical details, the main ideas are still useful as "scaffolding".

The Structure

- Title
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- Introduction (1-2 pages)
- The problem/My ideas (2-3 pages)
- Technical details (4-6 pages)
- Related work (1-2 pages)
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It goes at the end of the paper.

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Give real comparisons, not a "laundry list"!

- Explain in detail how your work fills the Gap in a way that related work doesn't.

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Give real comparisons, not a "laundry list"!

- Explain in detail how your work fills the Gap in a way that related work doesn't.

It may be prepared at the very first stage of your research.

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Related work (1-2 pages)

Conclusions and further work (0.5 pages 0 readers)

When get to a start, we have...

Three Suggestions

1. Make Sentences and Paragraphs Flow

It should be clear how each sentence and paragraph relates to the adjacent ones.

Does this text flow?

Security proofs of cryptographic protocols are crucial for the security of everyday electronic communication. However, these proofs tend to be complex and difficult to get right. The game-playing technique, originally proposed by Jones et al., follows a code-based approach where the security properties are formulated in terms of probabilistic programs, called games. This is a general design principle for cryptographic proofs to ease their management.

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What does this game-playing technique have to do with what came before?

From Old to New

Begin sentences with old info

- Creates link to earlier text

From Old to New

Begin sentences with old info

- Creates link to earlier text

End sentences with new info

- Creates link to the text that follows
- Also places new info in position of emphasis

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Application

Security proofs of cryptographic protocols are crucial for the security of everyday electronic communication. However, these proofs tend to be complex and difficult to get right. To make it easier to manage such proofs, Jones et al. have proposed a new design principle, called the game-playing technique. This technique follows a code-based approach where the security properties are formulated in terms of probabilistic programs, called games.

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2. Make Sentences and Paragraphs Coherent

It should be clear how each sentence and paragraph relates to the big picture.

Lions and tigers are some of the most dramatic and awe-inspiring species of cats. Most of these large cats, however, are currently facing extinction. A smaller cat that has been more evolutionarily successful is the house cat. Although house cats are currently the most popular pet in the world, they are in many ways anti-social. It would therefore be interesting to study whether house cats can be trained to be more sociable.

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One Paragraph, One Point

A paragraph should have one main point, expressed in a single point sentence.

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Typically the point sentence should appear at or near the beginning of the paragraph.

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Lions and tigers are some of the most dramatic and awe-inspiring species of cats. Most of these large cats, however, are currently facing extinction. A smaller cat that has been more evolutionarily successful is the house cat. Although house cats are currently the most popular pet in the world, they are in many ways anti-social. It would therefore be interesting to study whether house cats can be trained to be more sociable.

There appears to be a negative correlation between the charisma of a species and its ability to survive. Lions and tigers, for instance, are among the most majestic creatures in the animal kingdom, yet they are currently facing extinction. In contrast, the house cat is evolutionarily quite successful, even though it is mostly known for stupid pet tricks.

3. Name Your Baby

Principle

Give unique names to things and use them consistently.

Abstract. This paper proposes a new timed model named *nested timed automata (NeTAs)*. A NeTA is a pushdown system whose stack symbols are *timed automata (TAs)*. It either behaves as the top TA in the stack,

Abstract. Nowadays, data provenance is widely used to increase the accuracy of machine learning models. However, facing the difficulties in information heredity, these models produce data association. Most of the studies in the field of data provenance are focused on specific domains. And there are only a few studies on a *machine learning (ML)* framework with distinct emphasis on the accurate partition of coherent and physical activities with implementation of ML pipelines for provenance. This paper presents a novel approach to usage of data provenance which is also called *data provenance based system for classification and linear regression in distributed machine learning (DPMLR)*. To develop the

BID: An Effective Blind Image Deblurring Scheme to Estimate the Blur Kernel for Various Scenarios

Chinese Scientific Writings VS. English Ones

Difference Reasons

Volunteer Policy VS. Employee Policy

Difference Reasons

Volunteer Policy VS. Employee Policy

Welfare VS. Revenue

Difference Reasons

Volunteer Policy VS. Employee Policy

Welfare VS. Revenue

Rare Page Charges VS. All Page Charges

page limitations

page limitations

focus on result, not procedure

page limitations

focus on result, not procedure

discriminate theoretical contribution

page limitations

focus on result, not procedure

discriminate theoretical contribution

easy to be desk rejected

make a wider background (than English one).

make a wider background (than English one).

Not too wide!

make a wider background (than English one).

Not too wide!

give the contribution statement earlier,

make a wider background (than English one).

Not too wide!

give the contribution statement earlier, and bigger.

make a wider background (than English one).

Not too wide!

give the contribution statement earlier, and bigger.

rebuild the paper shorter and more concise,

How to Prepare

make a wider background (than English one).

Not too wide!

give the contribution statement earlier, and bigger.

rebuild the paper shorter and more concise, to satisfy the length and to save the money!

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Care on the Chinese scientific writing on **punctuation**!