CE7451: Research Methods in Computer Science & Engineering

Technical Writing: Papers

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Today's Focus

Writing a technical paper: How to go about this very important process in your PhD

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Open Discussion

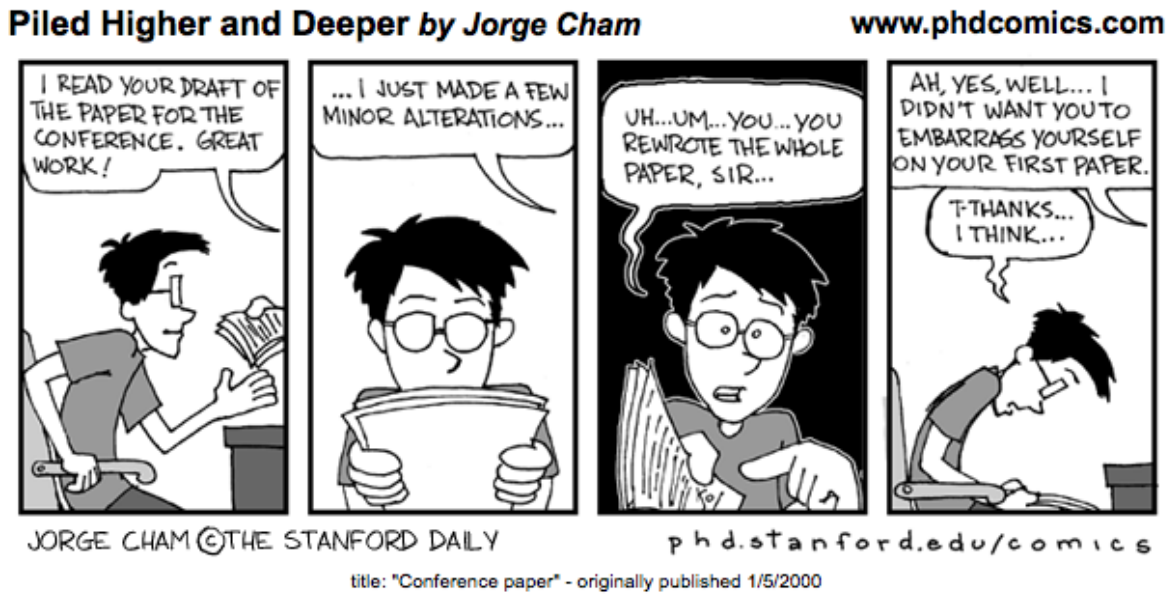
Why do we write papers?

Open Discussion

Why do we write papers?

Do you think there are better ways to achieve the same objectives?

Why today's session: The real answer



title: "Conference paper" - originally published 1/5/2000

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Abstract & Introduction

Introduction and abstract are as important as technical content

- Often the neglected pieces
- A good abstract will attract reviewers, and later readers, to at least look at your paper
- A poorly written introduction sets the tone for the rest of the article, and can turn off the reviewer/reader
- Worse, it can misplace the reader's expectations, only dashing them later on

Introduction must contain . . .

Motivation

- What is the problem being addressed
- Why is it important to address it
- Go beyond saying “it is technically challenging/interesting"

Contributions

- Clearly identify all the contributions
- State all assumptions being made

Perspective

- How do the contributions compare with the state-of-art

Related Work: The make or break section

Here you get to give opinions about your reviewers' work!

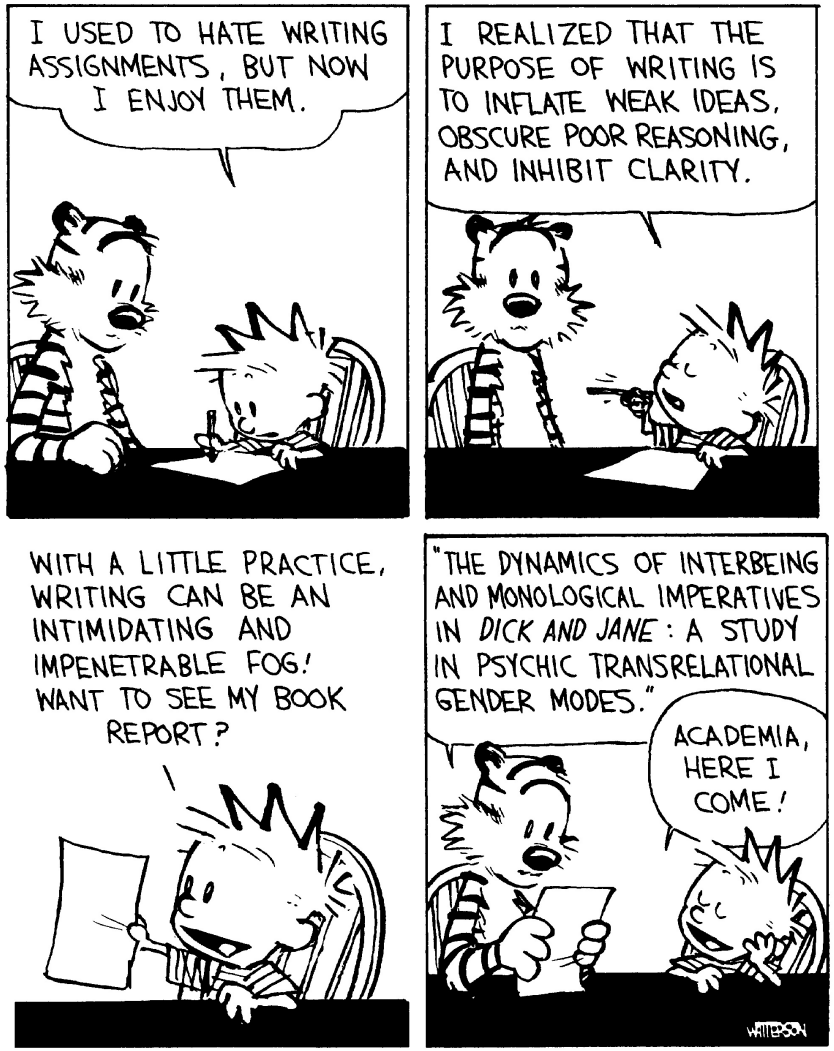
- Choose your words very carefully
- No personal comments please, no matter how much you hate some work/people

Don't just list related work: "In [4], the authors did ... In [5], an alternative approach using ... was demonstrated."

Motivate your contribution (tell your story): What are the gaps/challenges that your work uniquely addresses?

Say something wrong here, and more likely than not your paper will be rejected

About bad writing style



Bad Writing Style Contest

Technical Content: Be precise

If you can say something in one sentence, do it

- Being verbose for the sake of it will not help
- You are not being judged for how many pages you can fill

If you can express something mathematically, do it

- Reduces scope for ambiguity
- Its hard to be precise in English

Technical Content: Be precise

The owner of a pet shop is a retired mathematician. He never lies, and he makes very precise statements. He tells a customer the parrot in the cage is extremely intelligent - in fact, "this bird will repeat every word he hears."

The customer, impressed, buys the parrot. In a few days, the outraged customer returns with the parrot, saying, "I spoke to him for hours every day, but this stupid bird has not repeated a single word I said."

Nevertheless, the pet shop proprietor did not lie. Is this possible?

Technical Content: Be precise

The bird is deaf. This is the most obvious solution.

Since the proprietor did not say when the bird will repeat what he hears, an other answer is that the bird will repeat every word - in a few years.

The customer may be lying. (His wife found out how much the bird cost and forced him to return it.)

And many more . . .

Technical Content: The power of imprecision

Unfortunately, our mind is not tuned to think in equations

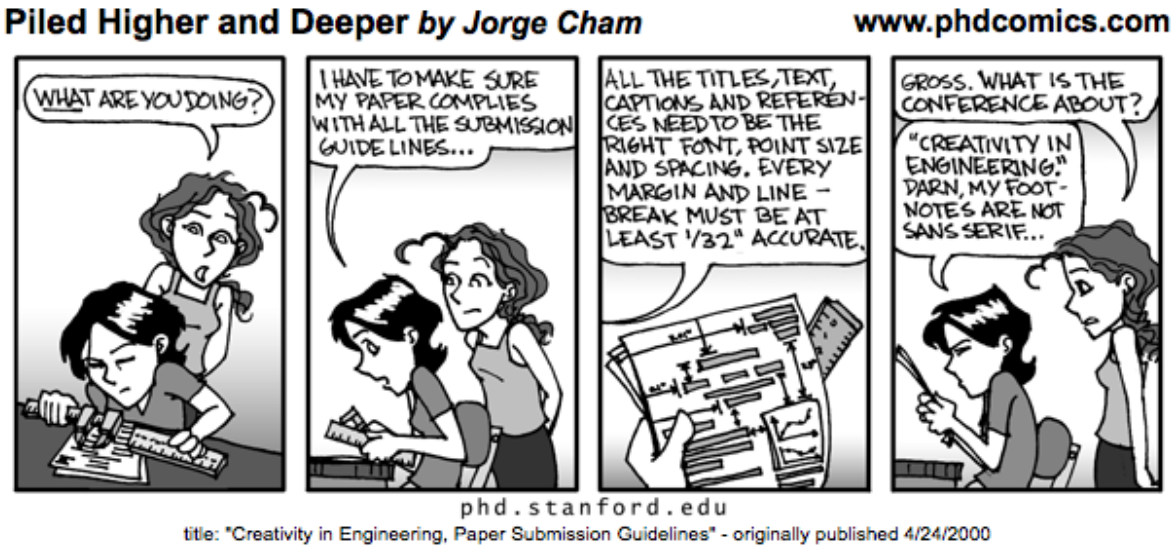
- English, or any other natural language, is the most natural way to communicate
- Use examples extensively – simpler the better
  - Most effective mechanism to communicate complexity
- Equations are simply tools for precisely recording and validating our thoughts
  - Not necessarily for communicating them

Empirical/Experimental Evaluations

Depending on research area, there is more or less significance given to this section

- Describe your experimental setup in enough detail so that it can be accurately reproduced
- Graphs must be legible
- State the objectives and assumptions clearly
- Ensure comparisons with related work are fair
- Explain any biases in your experimental setup

Formatting your paper: Challenges



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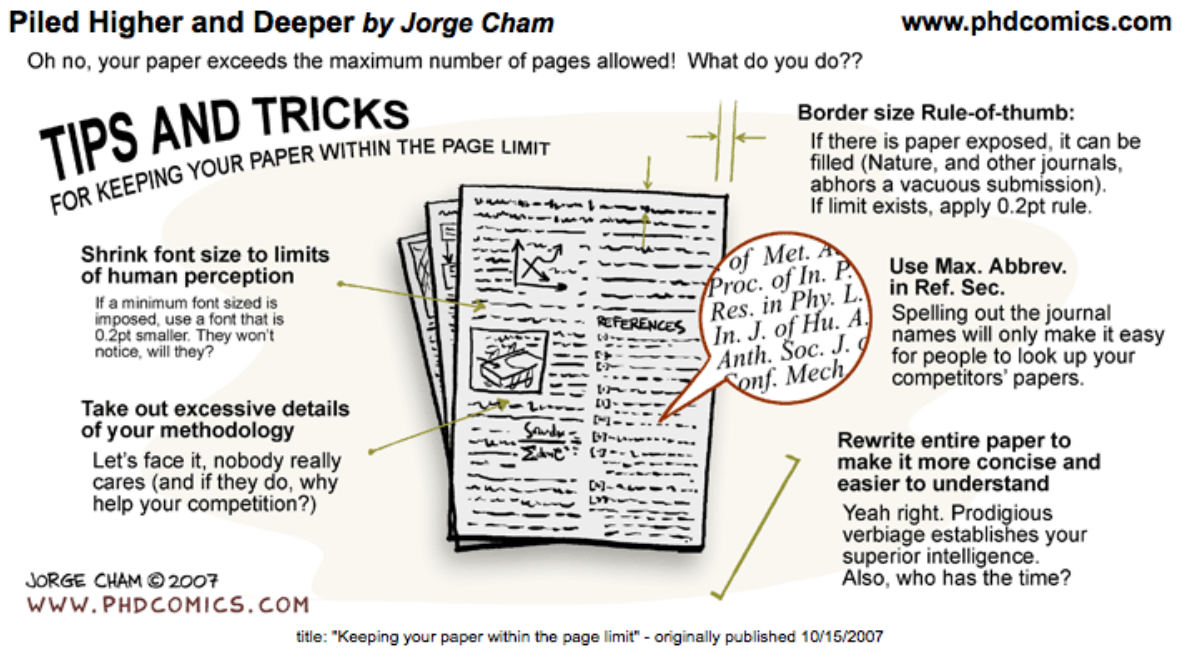
Formatting your paper: Usual way to deal with them



My favorite references for writing

“The Elements of Style" by William Strunk Jr. & E. B. White

“Writing for Computer Science" by Justin Zobel

Writing Assignment

Write a 1-page (A4-sized) article outlining your PhD research

- The format is open for you to decide
- You must use LateX
- The write-up is due at the start of class on October 23
- Each one of you will have 2 minutes to present your write-up on that day
- Think about what you want to say (it should include the writing style you chose, the technical content you chose, etc.)