Writing a Paper

Michalis Faloutsos

Publishing a paper

- Having a good idea is not enough
- You need good and clear writing
- You need to make clear claims
- Work needs to be bullet-proof

Typical Conceptual Problems

- Missing previous work: deadly
- Not compare with "competition"
- Not explain: scope, novelty and importance
- Not thorough:
  - Arbitrary assumptions, unexplained choices
- Weak claims vs strong claims
  - We propose an algorithm vs
  - We develop the optimal algorithm that solves everything
  - We develop the best algorithm to date (45% better)

You need help from supervisor

- **You** need to solicit the help
  - Especially for first papers
- Ask early: have things planned out
- Persist: keep asking until you get the help
  - Be polite but relentless

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Writing the paper

- Let us assume you have done the work
- Think first what you want to write
  - Make clear:
    - Problem
    - Contributions
    - Results
  - Each should be explainable in 3 lines or 3 bullets in your draft
- Then write the paper

Practical Advice

- **TRY IT!**
- Write on a piece of paper a skeleton
  - Paragraph level: approx one line per paragraph
- Having a plan makes writing easier!

Practical Advice

- Found also at:
- http://www.cs.ucr.edu/~michalis/TECHWRITING/structure.html

Some rules

- Recursiveness
- Top Down
- Warning the reader

Recursiveness

- Recursiveness 1: In every section, the first paragraph should be a summary/overview of the section.
  - Start by: "In this section, we present..."
- Recursiveness 2: In every paragraph, the first (or second line) should correspond to summary of the paragraph.
  - I.e. Adding caches can improve performance…
  - The problem we address here is the placement of caches to improve performance…

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Top Down

- Start from high level add details slowly.
- Readers should not have to read the whole paper
  - Abstract: key novelty (1 paragraph summary)
  - Introduction: 1-2 page summary

Guiding the Reader

- Prepare the reader:
  - Reports are not suspense thrillers.
- Provide context:
  - put the stress in a statement
  - "We **study** a **distributed** algo for the **weighted BUBA** problem on **weird** graphs that runs in **subatomic** time"
- Say what you want the reader to remember

The Structure of a Systems Paper

- Assume 15 pages in total
- Intro 1-2 pages
- Background/Model 1-2 pages
- The Idea 2-3 pages
- Analysis 2-3 pages
- Simulations/Experiments 4-5 pages
- Discussion 1-2 pages

In more detail…

- Abstract and Introduction are the most important sections

Abstract

- 1 paragraph 200-300 word.
- This is the ad and trailer for the paper:
- Think of how you would explain the work to your office mate

Structure of Abstract

- 1-2 lines: problem addressed
- 1-2 lines: novelty of solution
  - Not been done before
- 1-2 lines: motivation and importance
- 1-2 lines: per result or contribution [quantify claims if possible: 50% faster]

Introduction

Each part is one-two paragraphs

- Set the stage: problem, motivation, importance, main contribution
- Background info: if necessary
- The problem: high level definition, significance
- Previous work [usually one line per effort, 1-2 lines why your work is needed/diff.]
- Contribution:
  - what you do and its properties
  - list of quotable achievements and results
- "The rest of this paper is structured as follows. In section 2,....."

More in my webpage

- ❑ http://www.cs.ucr.edu/~michalis/TECHWRITING/structure.html