LECTURE 9:

Writing Up

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Don't let people make fun of your effort! Select the right words.

Overview

- Getting Started
  - –Writing Tips
  - –Paper Scope
  - –External Sorting
  - –Paper Organization
- Publishing
  - –First Draft
  - –Submission
  - –Thesis
- Parting Words

- Start writing early to organize your thoughts
- Know your audience
  –What is common knowledge?
  –What needs more details?

Write down everything that motivated you to start the research:

- What did you want to achieve?
- Why is it interesting to report?
- How would it help others?
- what makes the problems interesting?

Question you should ask before you write a research paper:

- which results are the most surprising?
- what is the one result that other researchers might adopt in their work?
- are the other outcomes independent enough to be published separately later on?
- what is the key background work that has to be discussed?
- who are the target audience?

Organization of a research paper:

- start with background results or new results.
- audience determines amount of background materials.

- a research paper is a sequence of concepts, building from a foundation of knowledge assumed to be common to all readers up to new ideas and results

- the narrative told by a paper is a walk through the ideas and outcomes.

- it is NOT about a story of day-to-day activities.

Chain

State the Problem $\rightarrow$ Background $\rightarrow$ Improvement

Specificity

- good for results that can be divided in several stages.
- first outline the general terms and then progressively fill in the details.
- good for highly technical papers.

Complexity

Simple cases $\rightarrow$ Complex cases

Example

- begin with explanation how the idea or result can be applied to some domains.
- the next step is to provide more formal framework about the implementation of the idea/result.

Organization of Research Paper

Common Sections:

- Title & Author
- Abstract
  - –50 to 200 words
  - –Summary of the paper
- Introduction
  - –Extended abstract
  - –Motivation & results
  - –Avoid jargon & notation

Avoid Jargon!...Technical writing is straight forward

Organization of Research Paper

Common Sections:

- Body
  - – Background & terminology
  - – Detailed proofs & results
- Literature Review
  - –discuss and compare existing studies
  - –extensions of or corrections to previous research
  - –good to represent comparison of existing studies in a table
- Conclusions
  - –include a concise statement of the paper's important results and an explanation of their significance.
  - –state the limitations of the work
  - –state the future enhancement

Paper Organization Examples

- 21st Century Computer Architecture, A community white paper, May 2012. [PDF] 15 10/23

- Challenges and Opportunities with Big Data, A community white paper. [PDF]

- Shi-Kuo Chang, Yao Sun, and Yingze Wang: Component-based Slow Intelligence System, Journal of Internet Technology, 2012. [PDF]

- Wang, J., Zhai, S., Canny, J., Camera Phone Based Motion Sensing: Interaction Techniques, Applications and Performance Study, In Proc of ACM UIST 2006. [PDF]

- Mark Harman, S. Afshin Mansouri, Yuanyuan Zhang Search-based software engineering: Trends, techniques and applications, ACM Computing Surveys (CSUR), Volume 45 Issue 1, November 2012.

- Qi X., Davison B. , Web page classification: features and algorithms , ACM Computing Surveys 41(2): 1-31, 2009

- First Draft
  - –Use simple sentences to avoid writer's block
  - –Brainstorm ideas with advisor
  - –Outline ideas
- When you get stuck:
  - –Try different angles
  - –Talk with advisor
  - –Go <do your favorite activity>(I go jogging)

- Anticipate objections
- Make conservative claims, don't make unnecessary claims.
- Be thorough with evidence
- Keep a log book(Ideas, proofs, & hypotheses)
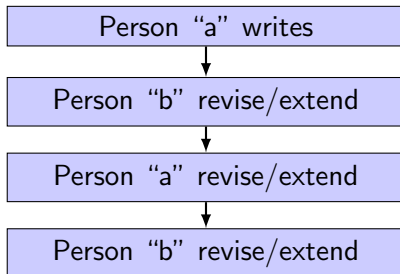
Make sure you identify the right co-author(s)! Avoid the
following...

"I know nothing about the subject,
but I'm happy to give you my expert opinion."

- Each author writes different sections Disadvantages:
  - –Disjoint styles
  - –Inconsistent tables & figures
  - –Repetition & omission
- Taking Turns $\oplus$ Exclusive locks

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┌─────────────────────────────┐
│      Person "a" writes       │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Person "b" revise/extend   │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Person "a" revise/extend   │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Person "b" revise/extend   │
└─────────────────────────────┘
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- Technical Reports
  –a report that is published before official publication by a publisher
  –"Stake claim" to your ideas. A way to quickly publish your idea and claim it.

- Demonstrate original & meaningful research
- critique your own results:
  – Why is this algorithm better? →fewer CPU cycle? Less memory usage?
- show the importance of a topic
- show the results are useful to others.

A Writing-Up Checklist

☑ have you identified your aims and scope?

☑ are you maintaining a log and notebook?

☑ does the paper follow a narrative?

☑ in what forum, or kind of forum, do you plan to publish?

☑ are you writing a well-defined structure and organization?

☑ have you chosen a form for the argument and results?

☑ are the requirements of journal/conference/thesis met?

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