Publishing Your Research Results

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Outline

- The basics of a good research paper
- Tips on writing well
- The paper reviewing process
- Building your publication portfolio
- Some ethical concerns
Outline

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• Tips on writing well
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Pick a Good Research Problem

• Why is the problem important?
  • What are the benefits of solving this problem?
  • Why should anyone care?

• Are there new fundamentals/principles/insights involved?

• Is this a problem area with “legs”
  • Once you are done, is the story over, or is this fundamental work leading to lots of other future work?
  • Are you setting a foundation?
  • Making a significant step forward on a known problem?
Every Paper Should Tell a Story

• What is the “elevator pitch” of your paper?
  
elevator pitch = summary short enough to give during an elevator ride

• Story is *not* what you did, but rather
  • what you will show, new ideas, new insights
  • why interesting, important

• Why is the story of interest to others?
  • universal truths, hot topic, surprises or unexpected results

• Know your story!
High-level Outline I

- Title
  - On topic
  - Catchy title doesn’t hurt
- Abstract
  - Short and informative
- Introduction
- Related work
- Proposed solution
- Evaluation
- Conclusion
High-level Outline II

- Title
  - On topic
  - Catchy title doesn’t hurt
- Abstract
  - Short and informative
- Introduction
- Related work
- Proposed solution
- Evaluation
- Conclusion
Introduction: crucial, formulaic

- If reviewer/reader not excited or intrigued by intro, paper is lost
- Recipe:
  - par 1: motivation: broadly, what is problem area, why important?
  - par 2: narrow down: what is problem you specifically consider
  - par 3: “In this paper, we ....”
    - most crucial paragraph, tell your elevator pitch
  - par 4: how different/better/relates to other work, at high level
  - par 5: summarize contributions at high level, long-term 10K ft view of contribution: change the world!
    - Perhaps, bulleted list of major contributions
  - par 6: roadmap:
    “The remainder of this paper is structured as follows”
Related Work Section

• Be specific about past related work, how proposed research differs
  • What is the value added of proposed work (not just difference)
  • Be honest, everything you did does not have to be better than prior work
  • Depending on target venue, can sometimes assume reviewers are knowledgeable and describe related work accordingly
Proposed Approach Section

- Sometimes start or precede approach with an overview or background section

- **Overview section/subsection**
  - Provides a high-level description of the approach
  - Major components and how they fit together
    - Provides the structure for the more detailed approach section/subsection that follows

- **Background section/subsection**
  - Describes past work that is going to be built upon
  - Needed to understand your contributions

- Often these sections introduce the primary terminology
Proposed Approach Section

• Pick your terminology carefully
  • Consistently use that terminology
    (this is not creative writing)

• Pick your notation carefully
  • As complicated as needed, but no more so

• Simplicity is elegant!
  • Most well understood solutions have a straightforward beauty
Proposed Approach Section

• Provide a concrete and compelling example
  • Single running example or set of well selected examples
  • Need to help the reader clearly understand via example(s)
    • Thus, need to present at least some example(s) early in the paper

• Can be difficult to find a good example
  • Not too long or difficult so it can be easily explained and understood
  • Not too easy so that the interesting and difficult points are not lost on the reader
Proposed Approach Section

• **Not** an historical account of what you did
  • Although you can provide a summary of what you tried that did not work and why
    • In earlier work, we approached this problem...
    • We originally tried to..., but this did not work because...
Evaluation Section

- Maturity is measured by evaluation, not effort
  - A prototype is not an evaluation
  - An example is not an evaluation
  - A case study is not an experiment
- Expected level of evaluation depends on the status of related work
  - Body of similar work, then must experimentally or analytically evaluate your approach
  - New, innovative idea perhaps can be validated with a compelling example or small case study
- Evaluation in some areas (e.g. where time, space, throughput are not the issues) can be very difficult
**Conclusion Section**

- Summarize approach
- Summarize benefits and limitations
- Discuss future work
  - Interesting ways to build on this work and address the limitations
- **Thrice told**
  - Intro describes what is going to be presented
  - Approach provides the details
  - Conclusion describes what was presented
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Put Yourself in the Place of the Reader

• Page upon page of dense text is no fun to read
  • Avoid cramped feeling of tiny fonts, small margins
  • Create openness with white space: figures, lists

• Provide enough context/information for reader to understand what you write
  • No one has as much background/content as you
  • No one can read your mind
  • Define all terms/notation
  • Use examples to illustrate
Put Yourself in the Place of the Reader

• Less is more:
  • “I would have sent you less if I had had time” Mark Twain
  • Take the time to write less
• Readers shouldn’t have to work more than necessary
  • Won’t “dig” to get story, understand context, results
  • Need textual signposts to know where ‘story’ is going, context to know where they are
    • good: “e.g., Having seen that ... let us next develop a model
    • bad: “Let Z be”
• Intuitively motivate any formalism, before presenting the formalism
• What does the reader know/not know, want/not want?
  • Write for reader, not for yourself

Put Yourself in the *ZONE*
Master the Basics of Organized Writing

• Paragraph = ordered set of topically-related sentences

• Lead sentence
  • sets context for paragraph
  • usually transitions from previous paragraph

• Sentences in paragraph should have logical narrative flow, relating to theme/topic

• Don’t mix tenses in descriptive text

• Read Strunk and White: *Elements of Style*
Write Top Down

• Computer scientists (and most human beings) think this way!

• State broad themes/ideas/questions first, then go into detail
  • context, context, context

• Even when going into detail ... write top down!
Abbreviations

• Introduce abbreviations sparingly
• Intended to make the text easier to read
  • Only use abbreviations that actually shorten the name/expression
  • Only use abbreviations for names/expressions that you are going to be using a lot (>6)
  • If there is a well accepted abbreviation, then use it
  • Try to have cognitive distance between the abbreviations
    • StartI, Start1
• If you introduce an abbreviation, then use it!
**Good Writing Takes Time**

- Give yourself time to reflect, write, review, refine
- Give others a chance to read/review and provide feedback
  - Get a reader’s point of view
  - Find a good writer/editor to critique your writing
- Starting a paper two weeks before the deadline, while ideas/results are still being generated, is a non-starter
- Face-to-face meetings with co-authors to thrash out questions, focus, organization, order of authorship
Writing is Part of the Research

- Must figure out how to explain your work and its contributions
  - Usually learn more about the work in the process of describing it
How to Get Started

• Decide on the major thrust/contribution of the paper
• Decide on the terminology/notation
• Create an outline
  • Then create a more detailed outline
  • Could be a powerpoint presentation, where diagrams will be the figures in the paper
• Start in the middle and work outward
  • Usually write the introduction and conclusions last
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What happens after you submit your paper?

- Building your publication portfolio
- Some ethical concerns
The CONFERENCE Peer Review Process

- **Paper submission**
- **Paper to reviewers**
- **Reviews collected**
- **Decision made**

Each reviewer has 15-25 papers to read.

Face to face meeting or online discussion.

Accept or Reject.
Program Committee Process

• Program Chair selects the program committee members
  • Depends on the number of expected submissions

• Program committee members bid on the papers they would like to review
  • Avoid papers without sufficient expertise
  • Avoid conflicts of interest
    • E.g., same institution, co-author last 5 years, advisee or advisor, or the appearance of a conflict

• Each paper read by 3 reviewers
  • Must read the paper and write a review
  • Reviewers may ask others to do additional reviews
Program Committee Process

- Reviewers may read 15-25 papers (lots of work!)
  - Well written papers have an advantage
    - “It is a rather small contribution, but it was such a pleasure to read and summarized past work very well”
- Rank papers:
  - A: Must accept
  - B: Could accept
  - C: Should reject
  - D: Must reject
- Evaluate technical contribution (significance/originality, soundness, evaluation)
- Program committee discusses all papers above a threshold
- Come to a group consensus about what is an acceptance
The JOURNAL Peer Review Process

- Paper submission
- 3-4 reviewers
- Paper to reviewers
- Reviews collected
- Decision made
- Accept
- Reject
- Revised paper
A number of variations

• Single or double blind reviewing
  • Most often, reviews are singularly blind
    • Reviewers know the authors, but authors do not know the reviews (unless a reviewer decides to reveal their identity)
  • Double blind reviews, reviewers and authors not known

• Some conferences allow time for an author response before the final decision
  • Pro: authors can correct misunderstandings if they feel that their work was misread
  • Con: most authors feel obligated to respond, although reviewers rarely change their mind
What to do after a !REJECTION!

• Stay calm
• Ignore the tone
• Concentrate on substance
• If reviewer did not get it, it is your fault (mostly!)
• Resist temptation to play roulette with PCs
• Don’t give up
  • Improve the paper and resubmit
    • Perhaps reconsider the venue
  • Decide that the faults are too significant and move on
• Learn from your mistakes
More on Peer Reviews

- Peer reviews aim at assuring quality
- Quality depends on venue -> different thresholds
  - Carefully read the requirements specified in the journal/conference web site and comply with them
    - Satisfy time constraints/formatting/length...
  - Read several papers on similar topics from the same venue to get a sense of what is expected
More on Peer Reviews

• Reviewers do a voluntary job
  • Help them to help you
    • Don't give them an easy way to reject your work, submit your best (final) version
  • For journals, provide reviewers with useful feedback during the second round
  • Accompanying letter with resubmissions
    • Describe what you did to satisfy the reviewers concerns
    • Explain why you did not satisfy others
      • Although try to find some accommodating actions
      • E.g., We did not extend the example to include... because... We did include more explanation in section n, however, to describe...
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Building Your Publication Portfolio

• Journals
  • Top Journals
    • ACM Transactions on ...
    • IEEE Transactions on ...
  • Other Journals
    • Private publishers
      • Small circulation, costly subscriptions

• Magazines
  • ACM Communications, IEEE Computer
  • Less technical, wider audience
Build Your Publication Portfolio

• Top Conferences
  • Top tier, Flagship conference for the field

• Specialized high-quality conferences
  • Second tier, more specialize audience

• Lower-tiered conferences

• Workshops
  • Sometimes co-located with major conferences
Why Choose One Venue Over Another

• Journals reflect more mature work
  • More evaluation expected
  • Usually a year or two publication cycle
    • Jan. 10 submit
    • June 10 receive reviews, minor/major revisions
    • Jan. 11 resubmit (under your control)
    • June 11 receive second round reviews
    • Jan. 12 paper appears

• Conferences provide an immediate audience
  • Usually a 6-8 month cycle
  • Submit in January, Hear results in April, Conference in August

• Workshops provide an immediate and intimate audience
  • Usually a 2-6 month cycle
  • Small, focused audience
Writing style: audience

• Each venue has a reference audience, and you write for that audience
  • Target themes may differ
    • Emphasis on theory/principles vs. tools/empirical studies
  • Maturity of the work
    • Prototype development
    • Experimental evaluation
    • Real world experience
  • Journal/conference/workshop
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Ethical Code

• The ends don’t justify the means
  • NO double submissions
    • Corollary
      • Do not submit to a journal until the conference paper is presented
        • Ask for permission if you wish to submit prior to presentation
  • NEVER report data/facts that are unsubstantiated
  • NEVER report as yours, work done by others
• Don’t oversell your results or claims
  • Honesty is refreshing
Ethical Code

• Acknowledge the contributions of others
  • There is no justification for ignoring previous work and history of the field
  • Give proper credits to previous and contextual work
    • Remember that we stand on the shoulders of others
      • Acknowledge their contributions
  • But then when you are a referee, don't reject a paper simply because it did not refer to one of your papers...
Ethical Code

- Decide on authorship and author order BEFORE writing the paper
  - Occasionally this needs to change during/after the writing because the focus of the paper has changed
  - Discuss authorship with all the co-authors
  - Intellectual contribution is the major consideration

- Take reviews seriously
  - Peer reviews are fundamental to improving scientific work

- Help the community as a reviewer
  - You may say no, but more often you should say yes
  - When you do review, do a good job
Ethical Code

• Self plagiarism is still plagiarism
  • Conference to Journal fast-tracking
    • Reuse conference reviewers plus at least one other reviewer
    • Journal will indicate how much of the material must be new
      • Add more details
      • Add more evaluation
  • Include a reference when you re-use an example, table, data, etc.
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• Final Comments
Improving Your Chances

• Do good work
• Chose your problems carefully
• Avoid “idea” papers
• Polish, polish, polish
• Get rid of grammatical errors and spelling errors
  • Spell check!!
• Make figures readable
• Comply with font size and page limit requirements
• Know the literature
• Know your audience
• Develop your community
• Avoid the LPU temptation
• Don’t submit just for the feedback (the “throwaway” is your credibility)
Personal Recommendations

- Find your way through the publication jungle
- Favor established venues with good reputations over "easier" targets
  - Choose quality over quantity
- Aim at top journals but get there in a stepwise manner via conferences and workshops
Personal Recommendations

• Don't be frustrated by rejections
  • Good ideas and good work are a necessary but not sufficient precondition for an acceptable paper
  • Always somewhat of a crap shoot
• Strictly adhere to the ethical code
• Enjoy the feeling of accomplishment associated with writing a good paper