

# Publishing Your Research

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# Quick show of hands...

- 1) Have you read a paper in your field?



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- 4) Have you co-authored an accepted paper?



# The Publishing Process:

## *The Why of Writing Papers*



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# The “Writing Bug”

It feels good:

- to share what you’ve done
- for others to be interested in your work
- to show how you’ve advanced state of the art!



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# Types of Publications

- Poster
- Position / vision paper
- Implementation paper
  - Source code
- Research paper
- Experiences paper





# Where and What Depend on Why

- Research prestige
- Practitioner engagement
- Feedback
- Visibility
- Community engagement (so your work is used and benefits others)



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# Where and What Depend on Why

## Examples from Computer Systems

- Research prestige:
  - Flagship conferences for your special interest group like: Symposium on Operating Systems Principles (SOSP), Operating Systems Design and Implementation (OSDI), Architectural Support for Programming Languages and Operating Systems (ASPLOS), SIGCOMM
  - More specialized topics: Network Systems Design and Implementation (NSDI), File and Storage Technologies (FAST), Dependable Systems and Networks (DSN)
  - Archival journals: ACM Transactions on Computer Systems, Transactions on Storage
- Practitioner engagement
  - USENIX Annual Technical Conference (ATC), SRE Con, OpenSHMEM and Related Technologies
- Feedback
  - Arxiv.org
  - Poster sessions at conferences and workshops
  - EuroSys Doctoral Workshop
  - Special topic workshops: Workshop on Resource Disaggregation and Serverless (WORDS), MLSys
  - Hot Topics Workshops: HotOS, HotStorage, HotDep
- Visibility (e.g., for interdisciplinary work that straddles communities)
  - Arxiv.org
  - Special topic workshops: Non-Volatile Memories Workshop



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# Where and What Depend on Why

## Examples from Other Areas

- Research prestige:
  - Algorithms gold star: FOCS, STOC, SODA, ICALP
  - Even more competitive specialized conferences in hot areas: SIGGRAPH, NIPS
  - Flagship conferences in a more specialized area: SPAA, PODC, LICS, ALENEX, INFOCOM, MOBICOM; including new areas: International Conference on Neuromorphic Systems, quantum information systems
- Practitioner engagement
  - SIAM ACDA (part of its content), INFORMS (usually non-competitive), ALENEX (algorithm engineering)
- Feedback
  - Other non-competitive events: SIAM CSE, Civil Engineering conferences like EWRI
  - Satellite workshops with many conferences like IPDPS and Supercomputing
- Community engagement
  - Open source release
  - Open data sets: SNAP, Sparse Matrix sets



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# The Writing Process:

## *The How of Writing a Paper*



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# Know Your Audience

- Read lots of papers from the target venue
- Attend the venue (if a conference or workshop)
- Learn the conventions of the community – style, emphasis, “look” (e.g., theory papers have displayed definitions, theorems)
- Review for the venue if possible
  - Provide an expert opinion for papers your advisor is reviewing for a program committee and/or ask your advisor to recommend you as a reviewer
- Program Committees
  - Some conferences offer “shadow PCs” for senior students and young PhDs
  - Senior students may serve as volunteers if their advisor is the PC Chair

# A Recipe

- Prepare the raw ingredients
  - Figure out your paper's story
  - Do (another) literature search
  - Write an outline
- Repeat until fully baked:
  - Fill in more of your outline
  - Get feedback from non-author colleagues
  - Revise based on the feedback
- Communicate with co-authors
  - Agree on division of labor
  - Be explicit about authorship (who & in what order)
    - Different communities have different customs
  - Set internal deadlines (for outline, drafts of sections, full draft, feedback, etc.)
    - Note: non-academic co-authors may have additional deadlines for institutional review



# The Paper's "Story"

- What is the major accomplishment of the paper? Algorithms? Theory/proofs? Systems? High-performance codes? New understanding?
- What is the advance over the state of the art?
- Why should the reader care? What do you want them to take away from the paper?
- The story should convey why this is an appropriate venue.
- Start by talking this out. It should sound like a story that can be told in just a few minutes.



# Related Work

- Do another literature search before you write
  - You probably did a literature search before you started the research
  - Time has passed and your research has evolved
  - You may fear finding closely related research, but if you can find it, so can the reviewers
  - You need to know the state of the art NOW to tell the story of your contribution





# Start from an Outline

- Iterate and agree on the outline with your co-authors before you start writing
  - Easier to revise an outline than carefully crafted prose
- You don't need to fill in the sections in order
  - Sections I find easier to write first: Related Work, Methods, Results
  - Sections I often save until later: Introduction, Discussion
  - Writing the Abstract first can help frame the paper (and support the submission process)
- Nail down terminology (use macros if necessary)
- Create figures to be included



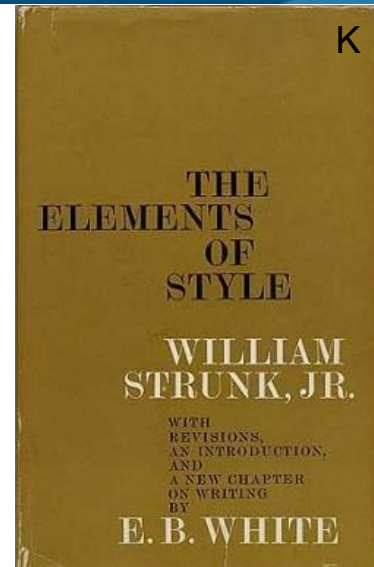
# Revise, Revise, Revise

- The paper will (and should) evolve
- Writing a paper can help you see the work in a new light
  - Need to be explicit about underlying assumptions
  - Often, need to explain work to non-experts in this area
  - Need to flesh out details that “seemed” clear
- Feedback from peers may suggest a new way to frame the problem you’re solving or identify new contributions
  - Don’t forget to get comments from people who may be skeptical of your approach
- Feedback may lead to changes in the outline, the figures, even the authorship



# Writing Resources

- Writing courses at your university
- Reference books (Strunk & White)
- Professional or pro bono proofreaders
- Tips on technical writing:
  - Hints for Technical Paper Writing, Armando Fox, [https://people.eecs.berkeley.edu/~fox/paper\\_writing.html#hints](https://people.eecs.berkeley.edu/~fox/paper_writing.html#hints)
  - How and How Not to Write a Good Systems Paper, by SOSF-9 chairs Roy Levin and Dave Redell, [https://www.usenix.org/legacy/publications/library/proceedings/dsl97/good\\_paper.html](https://www.usenix.org/legacy/publications/library/proceedings/dsl97/good_paper.html)
  - How to Get a Paper Accepted at OOPSLA, panel at OOPSLA 1993, <https://dl.acm.org/doi/pdf/10.1145/165854.165934>



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# ChatGPT

- ICML (International Conference on Machine Learning) allows ChatGPT-like tools “for editing or polishing author-written text”
  - Benefits both authors and reviewers
- They ban “text `produced entirely’ by AI.”
- Check the rules of the conference
- Safer to not use unless explicitly allowed
- If you use it to help with literature review, **check its output**. Look at the papers yourself.



# Obeying Double-Blind Rules

- Many conferences use double-blind reviewing
- Do include references to your previous related work, but use 3<sup>rd</sup> person (“Smith showed...”)
- If you have used a special resource from your school, lab, industry, don’t call it by name. Just give the relevant capabilities for experiments.
- If you are giving code, scripts, etc., to reviewers, place at anonymous location (github, dropbox) and remove anything in the code or copyrights that identify you.



# The Submission Process:

*Your paper's journey*



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# When to submit?

- Better to push for a fixed deadline or wait until the work is “ready”?
  - Can be stressful if you don’t feel your work is mature enough by the deadline
  - Deadlines can be great forcing functions for focus and making progress
- Many systems conferences are shifting to a journal-like reviewing model
  - Multiple submission deadlines per year
  - Examples: VLDB, NSDI, ASPLOS, SIGMOD
  - You can choose a deadline when your work is ready
  - Accept-with-revisions outcome enables a round of revisions for work that might otherwise have been rejected



# The Submission Process

- Abstract Pre-Registration
- Keywords = Reviewer Matching
- Conflicts on the PC: exact criteria vary, but include:
  - Your advisor, recent collaborators, folks from the same institution, personal relationships
- You may need to explicitly mark the paper ready to review
- Page limits and formatting rules are typically strictly enforced
- Suggestions:
  - Take advantage of reviewing site format checks on an early draft





# Examples of Guidance to Program Committees

Supercomputing 2022 review form items:

Written feedback items:

- Contribution summary
- Strengths and weaknesses
- Detailed comments
- Issues to address in a revision

Scored items: relevance, technical soundness, originality, quality of presentation, overall rating, expertise



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# Examples of Guidance to Program Committees

IPDPS (International Parallel and Distributed Processing Symposium) attempts to improve reviews

Review form items:

Reasons to accept, Areas for improvement, Detailed feedback

Multiple choice:

Overall first-round merit, nature of suggested improvements (can they be addressed in a revision?), writing quality, reviewer expertise and confidence, self-declared quality of the review



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IPDPS (International Parallel and Distributed Processing Symposium) attempts to improve reviews

PC chairs guidance to reviewers:

- Goal is to improve the submitted papers
- Do not claim a paper is not novel/original without giving citations proving it
- Multiple incremental steps can lead to big progress over time
- With limited space, experimental papers cannot compare to everything and do all sensitivity analysis, etc. Be reasonable in expectations for experimental work. New areas may be inventing experimental evaluation methods.
- Do not penalize a novel idea for being simple or intuitive. Ensure that complex ideas are still accessible and explain why the approach works.
- If you reviewed the paper before (for a conference where it was rejected): if you were positive, ask to review it again; if you were negative and don't believe it could be repaired, don't



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# Examples of Guidance to Program Committees

Architectural Support for Programming Languages and Operating Systems (ASPLOS) 2021

Written feedback items:

- Paper summary: What problem does it address? What are the paper's key insights? What are the paper's key scientific and technical contributions? What are its shortcomings or flaws?
- Comments for authors
- Questions for authors (in author response)

Scored items: paper formatting issues or double-blind reviewing violations, round 1 overall merit, round 2 overall merit, is this paper thought provoking?, is this paper convincing?, reviewer expertise, reviewer confidence



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# Examples of Guidance to Program Committees

Operating Systems Design and Implementation (OSDI) 2020

Written feedback items:

- Paper summary
- Strengths
- Significant weaknesses
- Comments for authors

Scored items: novelty, experimental methodology, writing quality, overall merit, reviewer expertise



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# Author Responses / Rebuttals

- Primary goals:
  - Correct any factual errors or misunderstandings in reviews
  - Answer reviewer questions on which their decision may hinge
  - Convince reviewers that you will incorporate their feedback
- Pro tips:
  - Sleep on it!
  - Prioritize reviewers' comments (e.g., points raised by multiple reviewers) & group by themes
  - As with all writing, start early, get feedback, iterate
  - What if your scores are very low or high?
  - More at [aka.ms/rebuttals](https://aka.ms/rebuttals)



# If Your Paper is Accepted

- Congratulations!
- You may need to work with a shepherd
- Copyright
  - Online web form usually
  - Must complete to get DOI and sometimes footnote content about rights to use
  - Non-academic co-authors are a complication



# If Your Paper isn't Accepted

- Yes, it will sting – give yourself time to process
  - Even established researchers have work rejected
- Reviewer comments are intended to help prepare the next version of your paper
- Rejection may be a good thing in the end





# Things to Avoid

- Plagiarism (including self-plagiarism)
- Dual submissions
- Submitting without knowledge of advisor/co-authors
- Least Publishable Unit (LPU)
- Complaining about reviews on social media
- All-nighters (start early, iterate often!)



# Summary

- Publishing gives you the chance to share the great work you're doing
- Where to publish depends on your goals: feedback, community engagement, research prestige
- Many resources to help with writing and submission process
- Start early, ask for feedback and iterate



# Questions?



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