

What I Wish I Had Known about Giving Technical Presentations and Doing Technical Writing

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Outline

- technical presentations
- technical writing
- why I like being a professor



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Motivation – Why Important

- technical presentations
 - ▲ informative, interesting
 - ▲ hold attention of audience
 - ▲ give a good impression of yourself
- technical writing
 - ▲ understandable, contributions clear
 - ▲ increase chance of getting paper accepted
 - ▲ build your reputation
- *sources*
 - ▲ *mentors, colleagues, students, books, websites, courses*
- why I like being a professor
 - ▲ a path doctoral students should consider

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Delivery

- stand next to the screen, use a pointer, do not block the screen
- use remote slide advancer, bring spare batteries
- face the audience, eye contact, gets attention, feedback to you
- talk with feeling and excitement, no monotone
- talk clearly, slowly, audibly: multilingual audience
- no “um” or “ah” - a silent pause is much better
- when answering questions from the audience,
if you do not know, say you will contact the person later
- if your hand is shaking, keep the laser pointer moving

Video a Rehearsal

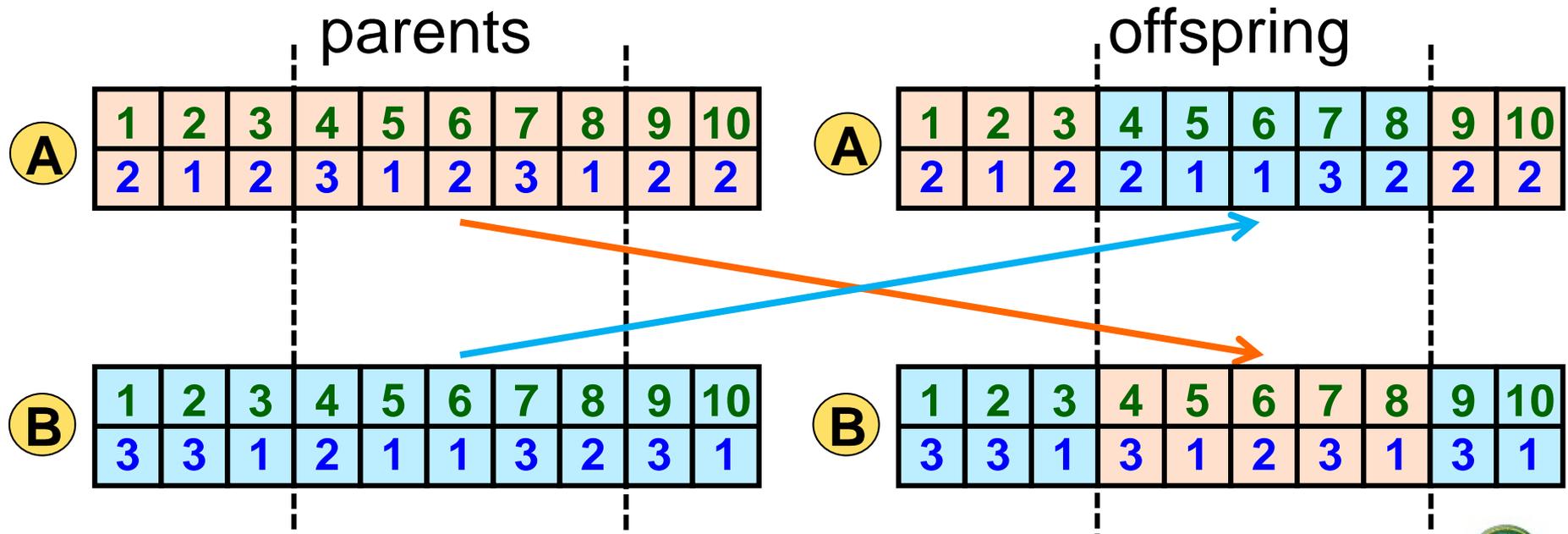
- video a rehearsal and evaluate how you look and sound
- what are your strengths?
- what can you improve?
- watch the whole presentation with no sound
 - ▲ what do your actions convey non-verbally?
 - ▲ hands? body? head? where are you looking?
- listen to the presentation without looking at the screen
 - ▲ do you sound confident?
 - ▲ does the tone of your voice sound interesting?
 - ▲ do you sound interested?
 - ▲ any “um”s or “ah”s?

Visual Style

- minimum of 20 point font, I like Arial
 - ▲ NOT: 8 point font
- number the slides so audience can ask questions at end
- use color, use animation, use figures
 - ▲ help clarify and emphasis points
- limit number of bullets per slide

EXAMPLE: Crossover in Genetic Algorithm

- selection of parents is done probabilistically
- crossover points are randomly selected
- exchange elements between crossover points
- generates two offspring



Timing

- know the amount of time allowed for your presentation
- always rehearse the talk out loud and time yourself
- if allocation time not given, ask program chair by email
- cannot present all details in paper, just motivate to read
- do not rush the talk, make it shorter if necessary
- if running out of time
 - ▲ do not speed through remaining slides
 - lose everyone
 - gives bad impression
 - better summarize remaining slides, skip to conclusions

Content

- consider who the audience for your talk is and their background
 - ▲ your presentation is for the audience, not you
- first slide
 - ▲ title, authors and affiliations, talk outline
- near the beginning of the talk
 - ▲ motivation – what will be useful to audience
 - ▲ indicate the focus of your presentation
 - ▲ describe the contributions of the research
- last slide: why it was worth listening to the talk
- use technical writing guidelines

Projector

- best to project from your own computer
 - ▲ fonts, colors
- be careful about background colors in figures being too dark
 - ▲ example of background too dark
- be careful about text colors in figures being too light
 - ▲ text too light
- avoid the bottom of the screen/slide if possible
- set up in advance to avoid delays caused by unexpected technical problems

Bullets

- short bullet items - not full sentences
- do not “read” bullets, talk about them
- “balance” multiple line bullets and have breaks in logical places
 - ▲ NOT:
balance multiple line bullets and have breaks in logical places
- no period at end of bullet

Special Characters

- use \rightarrow and NOT $-->$
- use \leq and NOT $=<$
- use \geq and NOT $=>$
- basic rule:
 - ▲ do not be lazy

General Rules

- bring backup of presentation on USB drive
- dress better than your audience to show respect for them
- show up early to
 - ▲ meet session chair or host
 - ▲ test computer connection and how presentation looks
- if you start to feel nervous
 - ▲ pause and deep breathes and then continue
- refine slides and rehearse presentation; repeat
- what do you like and dislike about talks you have seen?
 - ▲ what makes you lose interest when attending a talk?
- see books and websites on giving presentations

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Abstract

- capture the interest of a potential reader of the paper
 - ▲ person may use abstract to decide to read
- explain what paper is about and why worth reading
- make a clear statement of the topic of paper and research problem to be solved
- what research methods are used, e.g., analytical, simulation
- describe the work to be discussed in the paper
- give a concise summary of results and value
- typically limit to 300 words

Introduction Section

- write the “Introduction” section as if the “Abstract” did not exist
 - ▲ “Introduction” is self-contained and include abstract points
- clearly state the problem and motivate why it should be solved
- devote a few sentences to the relationship to prior work
- clearly list the contributions of paper
 - ▲ convince reader that it will be worth the time to read paper
- end with a section-by-section overview of the entire paper
 - ▲ e.g., “Section 2 describes ...”
- think about who will be the audience for your paper

Related Work Section

- it is “Related Work” NOT “Related Works”
- explain how your work builds on and/or differs from earlier work
- near beginning of paper if reader will understand enough to comprehend the comparison
 - ▲ can wait until near end if reader needs details in paper to understand contrast
- do not insult work of others – they may be reviewers – use tact
 - ▲ e.g., say “In that study, the focus is execution time, and energy usage is not considered.”
 - ▲ NOT: “That study is not important because it ignores the energy needed.”

“Sell” Your Paper

- use “Abstract,” “Introduction,” and “Conclusions” sections to *sell* your paper
 - ▲ do not claim more than you provide
 - ▲ e.g., NOT “our technique is also fault tolerant” unless shown
- indicate the contributions of the paper at the end of “Abstract,” “Introduction,” and “Conclusions” sections
- make it clear to the reviewer
 - ▲ focus of paper
 - ▲ contributions
 - ▲ why others would want to read this paper (why it should be accepted)

Wording

- avoid non-technical phrases
 - ▲ e.g., “cost increases rapidly” NOT “cost sky rockets”
- do not use contractions, e.g., “do not” NOT “don’t”
- the phrase “in order” is usually not needed
 - ▲ “...do this [in order] to accomplish...”
- “cannot” is one word and NOT two
- only use “since” for an interval of time (e.g., since yesterday)
 - ▲ “since” does NOT mean “because”
- use “between” for two objects and “among” for three or more
- use of “etc.” in an “e.g.” is redundant
 - ▲ NOT “e.g., house, car, etc.”

Terminology

- define terminology, variables, etc., *before* they are used
 - ▲ Let y be ... and z be ... Then $x = 2y + 4z$.
 - ▲ NOT “ $x = 2y + 4z$, where y is ..., z is ...”
- use variable names that intuitively match the entities that the variables represent
 - ▲ e.g., use m machines, NOT r machines
- do NOT use names just to match variable names in your programs
 - ▲ e.g., do NOT use “psqrt_post_v_loop”
- use commas in numbers
 - ▲ e.g., “200,000” NOT “200000”

Figures, Tables, Equations

- “Figure i ” should be the i^{th} figure that is referred to in the text
- figure should appear after (not before) it is referenced in text
- label sub-figures with lower case letters, (a), (b)
- “**Figure 2:** Results of simulation studies: (a) with Cholesky approximation, and (b) with Barnes approximation.”
- capitalization of figure label should be the same as in text
 - ▲ “interconnection network” NOT “Interconnection Network”
- for tables, same rules as for figures, except place caption above
- for equation placement, same ordering rules as for figure
- equation numbers right justified on same line
 - ▲ e.g., “ $X = Y + Z$ (5)”

Graphs

- label x-axis and y-axis including units of measure
- captions give all relevant parameter values
- labels large enough to read if printed
- make use of color
- capitalization of graph labels should be the same as in text
 - ▲ “interconnection network” NOT “Interconnection Network”

Punctuation

- periods and commas go inside a closing quotation mark
 - ▲ e.g., this is the “power metric.”
- follow “i.e.” (that is) and “e.g.” (for example) by commas
 - ▲ for example: “one of my students, e.g., Mark, will”
- “et al.” is abbreviation for Latin phrase “et alia” = “and others”
 - ▲ e.g., “Hansen et al. originated this technique [2].”
- “A, B, and C”: list of three or more, comma before “and”
 - ▲ “A, B, or C”: comma before “or”
 - ▲ “Prof. Smith, a computer scientist, and a mathematician”
 - this is clearly three people
 - ▲ “Prof. Smith, a computer scientist and a mathematician”
 - this is ambiguous – one person or three people?

\$5 Million Comma

- “Comma Dispute Is Settled as Maine Drivers Get \$5 Million”
 - ▲ NY Times Feb. 9, 2018
- law exempted “The canning, processing, preserving, packing for shipment or distribution ...”
 - ▲ “The court ruled **i** was not clear whether the law exempted the distribution ... or if it exempted packing for the shipment or distribution ...”
 - ▲ “Had there been a comma after 'shipment' the meaning would have been clear”



Acknowledgments

- place acknowledgments section before references section
- use the preferred spelling for the word “Acknowledgment”
 - ▲ do NOT put an “e” between the “g” and the “m”
- unnumbered section heading
- thank people who helped, e.g., proofreaders
- if a journal paper based on conference/workshop paper, indicate
- list any supporting research grant/contract

Acknowledgments: The authors thank J. Jones and M. Chin for their valuable comments. A preliminary version of portions of this material was presented at the 4th Cloud Computing Workshop [5]. This research was supported by NSF grant number CCF-123.

References Section

- references section heading is not numbered
- list references in order cited or alphabetical by last name of first author
- if you use abbreviations to save space, use them consistently
 - ▲ e.g., J., Conf., Trans., Int.
- “pp. 43-50” or “7 pp.” (pp. Latin for pages)
 - ▲ “pp. 1-7” → “7 pp.” unless really first paper in proceedings
- do not propagate errors or inconsistencies of others
- use **consistent** reference format
- do not use “et al.” in list of references – hurts co-authors

Example Reference Format: Journal, Conference

- Journal Article -

W. G. Nation and H. J. Siegel, “Disjoint path properties of the data manipulator network,” *Journal of Parallel and Distributed Computing*, Vol. 9, No. 4, Aug. 1990, pp. 419-423.

- Conference Paper -

M. Maheswaran and K. J. Webb, “Reducing the synchronization overhead in parallel non-symmetric Krylov algorithms,” *International Conference on Parallel Processing (ICPP '98)*, Aug. 1998, pp. 405-413.

What to Reference

- if same material appears in multiple sources, use order
 - ▲ journal, conference, book, book chapter, technical report, web page
- try to reference your own papers if possible
 - ▲ it helps to establish your credibility
 - ▲ maximum of 1/3 references to coauthors of current paper
- cite relevant work from conference series or journal where you are submitting
 - ▲ helps to show your paper is appropriate topic

Proofread

- proofread your paper very carefully for content, style, English
- proofread final pdf version including references
- read your paper as if you were a reviewer trying to find reasons to reject your paper
- have two other students read your paper to make sure it is understandable to someone other than yourself
 - ▲ acknowledgment; do not put them as coauthors
 - ▲ you should return the favor, read a paper by the other students
- all of this should be done before your advisor reads the paper

General Rules

- what do you like and dislike about papers you read?
- explain the significance of results in a figure or table
 - ▲ do NOT just state what is there to observe
- when describing studies, include all information on parameters and procedures so another person can reproduce studies
- spell-check your paper
- what did past reviewers say and why
 - ▲ learn from “perceived” past mistakes
- use figures with colors
- see books, websites, and courses on technical writing

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Top 10 Reasons Why I Like being a Professor

- #10. **hours**: flexible - you decide which hours you work (lots)
- #9. **dress**: however you want
- #8. **teaching**: to teach material you must really learn it
- #7. **research topics**: you pick (publishable and fundable)
- #6. **invited seminars**: get to visit colleges and companies
- #5. **conferences**: travel all over the country and world
- #4. **friends**: international set of friends
- #3. **students**: you pick (but try to get funding support)
- #2. **colleagues**: you decide what professors to work with
- #1. **tenure**: cannot be laid off!

Key Points to Remember

- pay attention to details
- proofread – fine tune – repeat
- think about who your paper/talk audience is
- checklist of “do”s and “don’t”s
- treat your paper/talk audience like you want to be treated when reading or listening
 - ▲ worth the time invested

Concluding Remarks

- conduct excellent research
 - present your research clearly
 - document your research in well-written publications
 - thank you for listening
- ▲ **The End**

