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
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

Parents:

```
A: 1 2 3 4 5 6 7 8 9 10
 2 1 2 3 1 2 3 1 2 2
B: 1 2 3 4 5 6 7 8 9 10
 3 3 1 2 1 1 3 2 3 1
```

Offspring:

```
A: 1 2 3 4 5 6 7 8 9 10
 2 1 2 2 1 1 3 2 2 2
B: 1 2 3 4 5 6 7 8 9 10
 3 3 1 3 1 2 3 1 3 1
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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
• 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 overview
• 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 $\rightarrow$
- use $\leq$ and NOT $\leq$
- use $\geq$ and NOT $\Rightarrow$
- 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)
• 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?
“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 it 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

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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
• Journal Article -

• Conference Paper -
What to Reference

• if same material appears in multiple sources, use order
• 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
Outline

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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