How to Give a Good Research Talk*

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*Adapted from Sally Goldman’s slides.
Why Are We Here?

• For your work to have significant impact, it is essential that you can convey results to your community

• Your technical reputation depends on colleagues’ reaction to your talk

• When on the job market this skill will be crucial in getting a research position in academics or industry

• Giving a good talk is a skill you can learn

• I will give you guidance and tips on giving a good talk
Goals of a Talk

• Goals:
  – keep audience’s interest (and attention)
  – convey technical material
  – communicate a key idea of work
  – provide intuition
  – convince audience to read your paper

• Non-Goals:
  – show people how smart you are
  – expect audience to understand most key details of your work

• Note that this meta-talk focuses on giving a conference presentation or job talk; other scenarios, such as teaching, can have different contexts, goals, and approaches
Outline

• Goals of a talk

• Planning stages

• Structuring your talk

• Slide preparation
  – What to do
  – What to avoid

• At the talk
  – What to do
  – What to avoid

• Concluding remarks
Planning Stages

• Know your audience:
  – What is their background?
    * general CS (or math, or EE)
    * somewhat specialized audience
    * highly specialized audience

• If someone has spoken before you:
  – Look at paper/abstract of relevant talks that preceded yours
  – Prepare to use context provided
Scheduling (if you can)

• If possible, schedule your talk at 10:00
  – most people are awake
  – few have gone back to sleep

• Bad times to schedule talk:
  – right before lunch since the audience is thinking about food
  – after lunch since the audience is more likely to be sleepy
  – late afternoon since people will be running out of steam

• Best to have room that will be comfortably crowded
Structuring Your Talk

• Use a top-down approach:

  1. Introduction: define problem, present a “carrot”, put in context, and give outline at end of introduction

  2. Body: high-level summary of key results

  3. Technicalities: more depth into a key result

  4. Conclusion: review key results, wrap up, give future work
The Introduction

• Define the Problem
  – *minimize use of terminology*
  – *use pictures/examples/props if possible*

• Motivate the audience (give a “carrot”)
  – why is problem important?
  – how does it fit into larger picture?
  – what are applications?

• Discuss related work
  – table useful (mention authors and dates)

• Succinctly state contributions of your work

• Provide a road-map (outline) *at the end of the introduction*
Concept Class of One-Dimensional Patterns

- The instance space $\mathcal{X}_n$ consists of all configurations of $n$ points on the real line.

- A concept is set of all configs. from $\mathcal{X}_n$ within unit distance under Hausdorff metric of some “ideal” configuration of $k$ points, where Hausdorff distance between configs. $P$ and $Q$ is

$$H(P, Q) = \max \left\{ \max_{p \in P} \left\{ \min_{q \in Q} \{d(p, q)\} \right\}, \max_{q \in Q} \left\{ \min_{p \in P} \{d(p, q)\} \right\} \right\}$$

and $d(p, q)$ is distance between $p$ and $q$.

- If $P$ is any configuration of points on $\mathbb{R}$, then concept corresponding to $P$ is

$$C_P = \{ X \in \mathcal{X}_n : H(P, X) \leq 1 \}$$

- $X$ is a positive example of $C_P$ if $X \in C_P$ and is a negative example otherwise.

- Concept class of one-dimensional patterns is

$$\mathcal{C}_{k,n} = \{ C_P : P \text{ is a configuration of } \leq k \text{ points from } \mathbb{R} \}$$
Concept Class of One-Dimensional Patterns

- Each concept $c$ is a set of fixed-width intervals on real line

- Each example $X$ is a set of points on real line

- Example $X$ is positive if and only if:
  1. each of $X$’s points lies in an interval from $c$
  2. each interval of $c$ contains a point from $X$
The Body

• Abstract the key results
  – focus on a central, exciting concept

• Explain significance of your work

• Sketch methodology of key ideas
  – keep it high-level, emphasizing structure
  – use pictures/diagrams if possible
  – provide intuition (helpful when someone later reads your paper)
  – gloss over technical details
The Technicalities

• Take key result (or part of it) and go into some depth

• Guide audience through difficult ideas
  – give overview
  – state result
  – show an example
  – review

• It is this portion of your talk that typically grows when you give a 50 minute talk
The Conclusion

• Provide a coherent synopsis

• Review key contributions and why they are important

• Discuss open problems/future work

• Indicate your talk is over (for example, “Thank you. Are there any questions?”)

• Be ready to answer questions
  – If there are points you glossed over that you expect the audience may be interested in, you may want to prepare some slides (just in case)
Slide Preparation—Do

- Decide what you want to say and say less!

- Allow an average of 1.5–2 minutes for each slide
  - exact amount of time determined by practice

- Use Repetition
  - “Tell them what you’re going to tell them. Tell them. Then tell them what you told them.”
  - realize that 20% of your audience at any given time is thinking about something else

- Use pictures/diagrams whenever you can
Slide Prep—Do (cont’d)

- Use a large font (at least 20 pt)

- Make neat/orderly slides

- Use overlays or other “scaffolding”

- Use color/animation (in a meaningful way; not just to attract attention)

- You need not use full sentences

- Number your slides

- Write reminders, key phrases, etc. on paper or in PowerPoint’s notes
Slide Prep—Do (cont’d)

• Check your spelling

• If you use a slide more than once, duplicate it

• **PRACTICE!**
  
  – give a practice for your colleagues, advisor, friends, pets, etc.
  
  – be ready to redo all your slides
  
  – practice again
  
  – be sure that all your material projects on the screen and contrast is good
  
  – make sure it does not take too much time *(Beware PowerPoint’s timer!)*
Slide Preparation—Don’t

- Overload slides

- Intend to use too many slides

- Put some detail on the slide that you do not want to talk about

- Get bogged down in details

- Try to give a core dump
Slide Preparation—Don’t (cont’d)

• Show complex equations

• Show complex code (even pseudocode)

• Have a slide that introduces a point that you are unsure of (unless you want to give the audience a chance to attack you)

• Present last-minute results (they are probably wrong)

• Have slides that you are not using mixed in with the rest

• Write messy, write (or use a font that is) too small, misspell words
At the Talk—Do

• If you expect the audience to take notes, provide copies of your slides
  – Rarely the case at a conference or colloquium/job talk

• Dress appropriately—this shows respect for your audience

• Have eccentricity (but not too extreme)
  – make it fun/easy for people to remember you
  – extreme eccentricity is bad for younger people
At the Talk—Do (cont’d)

• Be EXCITED about your work!

• Remind; don’t assume
  – If you assume a standard result, provide the audience with a brief reminder
    * The Ignorant Audience Law: someone important in the audience always knows less than you think everyone should know, even if you take the Ignorant Audience Law into account

• Talk with Sufficient Volume

• Make eye contact and “read” the audience
  – Change victims

• Be with the audience
  – Walk toward and away from the people as well as left and right to break down implicit barrier
At the Talk—Do (cont’d)

• Point to the screen, not slide/computer monitor
  – Use a pointer, not hand/pen

• Bring props, if appropriate

• Ask real and rhetorical questions to keep audience engaged

• Deflect obstructionists:
  – tell them you’d like to talk to them after the talk (about the interesting point made) because the point is a detail, tangential, has a long answer, you need to think about it, etc.

• End on time!
At the Talk—Don’t

• Talk too softly, mumble, or speak in a monotone voice, use “um”, “ah”, ...

• Read your slides

• Focus attention on the screen—you’ll end up talking to the screen vs. the audience

• Stand so that you block the projection

• Mention a detail/point you don’t want to talk about

• State a definition or other important concept without also printing it on the slide

• Darken the room (unless necessary to see) since it entices audience to sleep

• Babble on when you have nothing to say

• Run over time
Concluding Remarks

• Follow the guidelines provided here

• Take every opportunity you can to give talks (and thus get practice and feedback)

• Remember that the guidelines for structuring your talk must be adapted to each specific talk

• Preparing a good talk takes time; do not expect to throw it together at the last minute

• Practice for colleagues, etc. to get feedback

• AND: you will give better talks and reap the rewards that follow