

## How to Give a Good Research Talk\*

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\*Adapted from Sally Goldman's slides.

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### 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

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### 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

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### 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

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### Goals of a Talk

- Meta-Goal:
  - 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

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### 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

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## 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

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## Concept Class of One-Dimensional Patterns

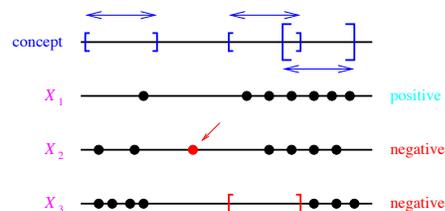
- The instance space  $\mathcal{X}_n$  consists of all configurations of  $n$  points on the real line
- A concept is set of all configs. from  $\mathcal{X}_n$  within unit distance under Hausdorff metric of some "ideal" configuration of  $k$  points, where Hausdorff distance between configs.  $P$  and  $Q$  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
 
$$C_{k,n} = \{C_P : P \text{ is a configuration of } \leq k \text{ points from } \mathbb{R}\}$$

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## 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  $X$



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## 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

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## 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

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## 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 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)

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## Slide Preparation—Do

- Decide what you want to say and say less!
- Allow an average of 1.5–2 minutes for each slides
- 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

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## Slide Prep—Do (cont'd)

- Use a large font (at least 20 pt)
- Make neat/orderly slides (computer-generated preferable)
- Use overlays or other “scaffolding”
- Use color/animation (in a meaningful way)
- You need not use full sentences
- Number your slides
- Write reminders, key phrases, etc. on paper

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## 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
  - make sure it does not take too much time  
(Beware PowerPoint's timer!)

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## 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

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## 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

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### 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

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### 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](#)
- **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

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### At the Talk—Do (cont'd)

- Point to the screen, not slide/computer monitor
  - Use a pointer, not hand/pen
- Bring props
- 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!

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### 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

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### 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

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