How to Give a Good Research Talk*

Stephen D. Scott

*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

- 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

Outline

- Goals of a Talk
- Planning Stages
- Structuring Your Talk
- Slide Preparation
  - The Do’s
  - The Don’ts
- At the Talk
  - The Do’s
  - The Don’ts
- Concluding Remarks

Planning Stages

- Know your audience:
  - What is their background?
    - general CS (or EE)
    - somewhat specialized audience
    - highly specialized audience
- If someone has spoken before you:
  - Look at paper/abstract of relevant talks that preceeded 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

    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)

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

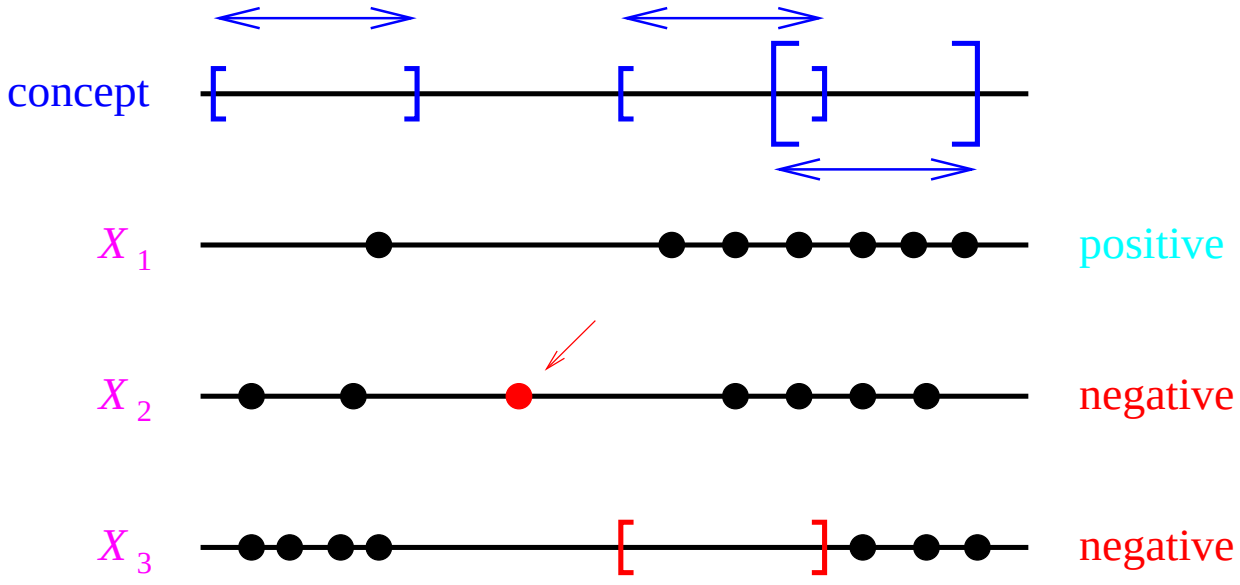
- Each concept c is a set of fixed-width intervals on real line

- 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's

- 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

Slide Prep—Do's (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

Slide Prep—Do's (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!)

Slide Preparation—Don’ts

- 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’ts (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's

- 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's (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

At the Talk—Do's (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!

At the Talk—Don’ts

- 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
- 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