

How to Give a
Good
Research Talk

Stephen Scott

Introduction

Goals

Planning

Structuring

Slide Prep

At the Talk

Conclusion

Questions

How to Give a Good Research Talk

Stephen Scott

(Adapted from Sally Goldman)

sscott2@unl.edu

Why Are We Here?

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- 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

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- 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
- Will focus on giving conference presentation or job talk
 - Other scenarios (e.g., teaching) have different contexts, goals, and approaches

Outline

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- 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

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Questions

- 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)

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- 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

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Questions

- 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

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- 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

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- 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

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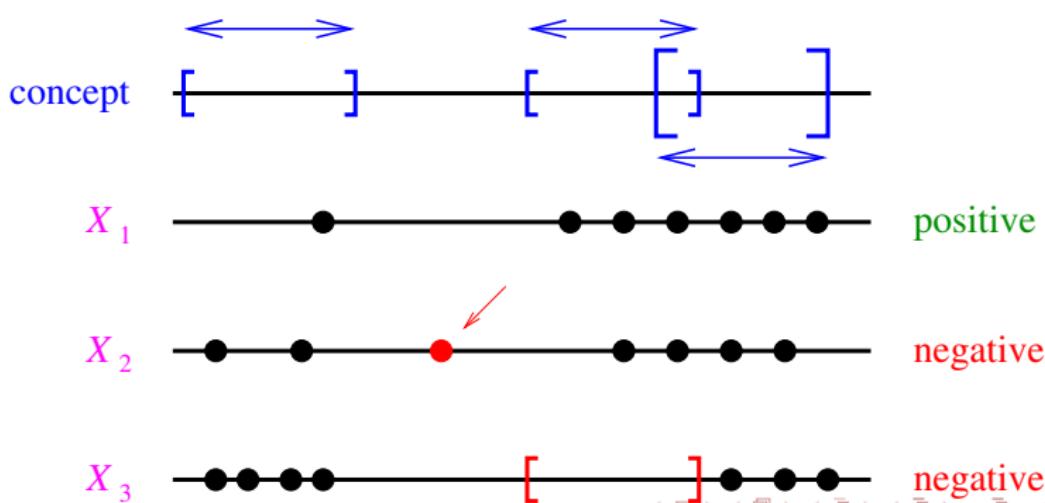
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Questions

- A concept c is set of fixed-width intervals on real line
- A example X is 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

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- 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

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Questions

- 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 that typically grows when you give a 50-minute talk

The Conclusion

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Questions

- 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 think will interest the audience, you may want to prepare some slides (just in case)

Slide Preparation—Do

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Questions

- 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)

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Questions

- 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)

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Questions

- 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

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Questions

- 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)

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- 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

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Questions

- 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)

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- 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)

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Questions

- 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

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- 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

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Questions

- 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

Questions

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