Giving a research talk

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A modification of a talk by Simon Peyton Jones
(Microsoft Research, Cambridge)
Giving a good research talk

This presentation is about how to give a good research talk

- What your talk is for
- What to put in it (and what not to)
- How to present it
A good talk...

- Crystallizes your ideas
- Communicates them to others
- Lets you get feedback
- Builds relationships
- May get you a job
The purpose of your talk...

...is **not**:  
- To impress people with your brainpower  
- To tell them EVERYTHING you know on the topic  
- To present ALL the technical details
The purpose of your talk...

is:

- To give your audience an intuitive feel for the idea
- To make them eager to read your paper
- To engage, excite, provoke them
What your talk is for

Your paper = The beef

Your talk = The beef advertisement

Do not confuse the two
Your ideal audience...

- Read all your earlier papers
- Thoroughly understand how quasitriangular Hopf algebra and quantum Grassmannians relate to Linear Quantum Turing Machines
- Are eager to hear about your latest work
- Are fresh, alert, and ready for action
Your actual audience...

- Have never heard of you
- Have heard of quantum Grassmanians but wish they hadn’t
- Just had lunch and are ready for a doze

Your mission is to

WAKE THEM UP
And make them glad they did
What to put in
The big 5 things in a talk

1. The large topic area (10%)
2. Why they should care (10%)
3. The specific problem (10%)
4. Your key idea (60%)
5. Proof it works (10%)
For example

1. The topic area
   Replacing cars with bicycles for commuting.

2. Why they should care
   More bikes = lower transportation costs, less global warming.

3. The specific problem
   existing bikes fall on winter ice, discouraging use.

4. Key idea
   Weld two bikes together side-by-side.

5. Proof it works
   Study shows 15% fewer winter accidents.
The topic area

- This is the BIG topic area, not the specific detailed issue.

- Don’t talk about aluminum welding techniques if your big topic area is approaches to alternate transportation.
Motivation (why they should care)

You need to answer these questions before they tune out:

- What is the problem?
- Why is it interesting?
- Why is it important?
Motivation

Example: Java class files are large (brief figures), and get sent over the network. Can we use language-aware compression to shrink them?

Example: synchronisation errors in concurrent programs are a nightmare to find. I’m going to show you a type system that finds many such errors at compile time.
Your key idea

If the audience remembers only one thing from your talk, what should it be?

- You must identify a key idea.
- Be specific: “If you remember nothing else, remember this:

  Side-by-side bikes save lives and the environment!”

- Organize the talk around this idea.
- Ruthlessly prune irrelevant material.
SERIOUSLY...

- You must articulate a key idea
  - It must be clear and specific
  - It is worth saying twice!
Seriously. Use examples

Examples: your main weapon

- To motivate the work
- To convey the basic intuition
- To illustrate The Idea in action
- To show extreme cases
- To highlight shortcomings

When time is short, omit the general case, not the example
ON POINT

- If your IDEA is that side-by-side bikes don't fall over on ice...
- Then don't focus on measuring...
  - People's bike color preferences
  - Cost of side-by-side bike repair
  - Bike impact on waterfowl migration
Proof it works...should be

- **SIMPLE TO UNDERSTAND**
  - Show the simplest graph/table/etc you can.
  - Explain how your “proof it works” connects to the BIG IDEA.
  - Don’t assume they’ll get the connection on their own
Proof it works...should be

- **GRAPHS: CLEARLY LABELED**
  - Label your dimensions
  - Show which direction indicates better performance
  - Make it clear which is the control and which is the “BIG IDEA” system
What’s good/bad here?
What to leave out
Outline of my talk

- Background
- The FLUGOL system
- Shortcomings of FLUGOL
- Overview of synthetic epimorphisms
- $\pi$-reducible decidability of the pseudo-curried fragment under the Snezkovvski invariant in FLUGOL
- Benchmark results
- Related work
- Conclusions and further work
No outline!

“Outline of my talk”: conveys near zero information at the start of your talk

- But maybe put up an outline for orientation after your motivation
- ...and signposts at pause points during the talk
Do not focus on related work

But

- You absolutely must know the related work; respond readily to questions
- Acknowledge co-authors (title slide), and pre-cursors (as you go along)
- Do not disparage the opposition
  - X’s very interesting work does Y; I have extended it to do Z
Related work

[PMW83] The seminal paper

[SPZ88] First use of epimorphisms

[PN93] Application of epimorphisms to wibblification

[BXX98] Lacks full abstraction

[XXB99] Only runs on Sparc, no integration with GUI
\[
\begin{align*}
\Gamma \vdash k : \tau_k & \quad \frac{\Gamma \cup \{x : \tau\} \vdash e : \tau'}{\Gamma \vdash \lambda x. e : \tau \rightarrow \tau'} \quad \frac{\Gamma \vdash e_1 : \text{ST } \tau^0 \tau \quad \Gamma \vdash e_2 : \tau \rightarrow \text{ST } \tau^0 \tau'}{\Gamma \vdash e_1 \gg e_2 : \text{ST } \tau^0 \tau'} \\
\Gamma \vdash e : \tau & \quad \frac{\Gamma \vdash e : \tau}{\Gamma \vdash \text{returnST } e : \text{ST } \tau^0 \tau} \quad \frac{\Gamma \vdash e : \tau}{\Gamma \vdash \text{newVar } e : \text{ST } \tau^0 (\text{MutVar } \tau^0 \tau)} \quad \frac{\Gamma \vdash e : \text{MutVar } \tau^0 \tau}{\Gamma \vdash \text{readVar } e : \text{ST } \tau^0 \tau} \\
\frac{\Gamma \vdash e_1 : \text{MutVar } \tau^0 \tau \quad \Gamma \vdash e_2 : \tau}{\Gamma \vdash \text{writeVar } e_1 \ e_2 : \text{ST } \tau^0 \text{ Unit}} & \quad \frac{\Gamma \cup \{x : \forall \alpha_i : \tau\} \vdash x : \tau[\tau_i/\alpha_i]}{\Gamma \vdash e : \tau'} \quad \frac{\Gamma \vdash e : \text{ST } \alpha^0 \tau}{\alpha^0 \notin FV(\Gamma, \tau)} \\
\frac{\Gamma \vdash e : \tau' \rightarrow \tau \quad \Gamma \vdash e' : \tau'}{\Gamma \vdash e \ e' : \tau} & \quad \frac{\Gamma \vdash \text{runST } e : \tau}{\alpha^0 \notin FV(\Gamma, \tau)} \\
\forall j. \Gamma \cup \{x_i : \tau_i\} & \vdash e_j : \tau_j \quad \Gamma \cup \{x_i : \forall \alpha_{j_i} : \tau_i\} \vdash e' : \tau' \quad \alpha_{j_i} \in FV(\tau_i) - FV(\Gamma) \\
\Gamma \vdash \text{let } \{x_i = e_i\}_i \text{ in } e' : \tau' & \quad \alpha_{j_i} \in FV(\tau_i) - FV(\Gamma)
\end{align*}
\]

Figure 1. Typing Rules
Omit technical details

- Even though every line is drenched in your blood and sweat, dense clouds of notation will send your audience to sleep.

- Present specific aspects only; refer to the paper for the details.

- Have backup slides to use in response to questions.
Presenting your talk
Polish slides the night before

Your talk must be fresh in your mind

- Ideas will occur to you during the conference, as you obsess on your talk during other people’s presentations
Practice your talk

- Run the talk by yourself
- Run the talk for your lab mates
- Run the talk for a friend
- Run the talk the night before
Do not apologise

- “I didn’t have time to prepare this talk properly”
- “My computer broke down, so I don’t have the results I expected”
- “I don’t have time to tell you about this”
- “I don’t feel qualified to address this audience”
How to present your talk

By far the most important thing is to be enthusiastic.
Being seen, being heard

- Point at the screen, not the laptop
- Speak to someone at the back of the room, even if you have a microphone on
- Make eye contact; identify a nodder, and speak to him or her
- Watch audience for questions...
Questions

- A golden opportunity to connect with the audience
- Answer questions briefly
- If a questioner wants to engage in a dialog:
  - Suggest you speak after the talk
Presenting your slides

Use animation effects

very very very very very very
very very very very very
very very very very
very very very
very very
very very
very very very
very very
very very
very very
very very
very very
very very
very very

sparingly
How many slides?

- **Research talk:**
  About 1 slide per 1 minute of talk

- **Teaching a class:**
  About 1 slide per 2 minutes of talk

- **This talk (for a class) has 38 slides and took about 80 minutes.**
Finishing

Absolutely without fail, finish on time

- Audiences get restive and stop listening when your time is up.
- Continuing is counter productive
- Just truncate and conclude
- Do not say “would you like me to go on?” (it’s hard to say “no thanks”)