

How to give a great research talk

Simon Peyton Jones
Microsoft Research Cambridge



Why you should listen to this talk

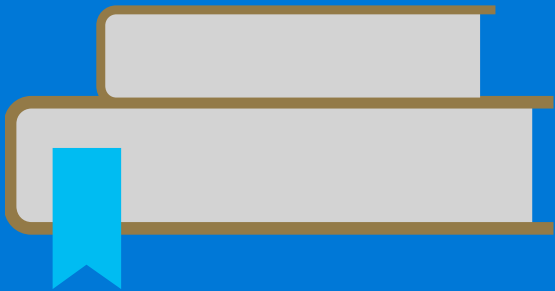
Research is communication

- Think: how often have you said “I’m really glad I went to that talk”
- Some simple, actionable ideas that can make your talks much better
- You will have more fun
- A research talk gives you access to the world’s most priceless commodity: the time and attention of other people. Don’t waste it!

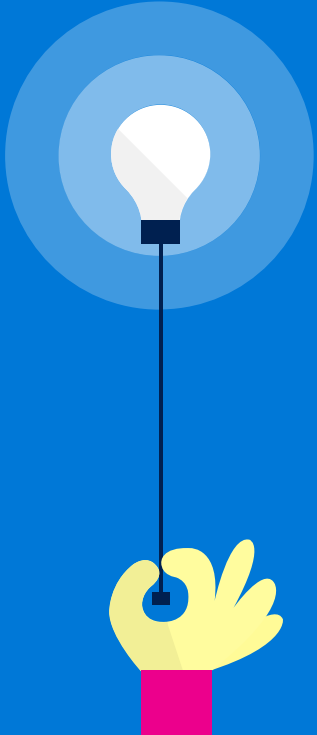
Purpose

The purpose
of your talk
is not:

- To impress your audience with your brainpower
- To tell them everything you know about your topic
- To present all the technical details



The
purpose of
your talk **is**:



- To give your audience an intuitive feel for your idea
- To make them foam at the mouth with eagerness to read your paper
- To engage, excite, provoke them
- To make them glad they came

Audience

Your audience...



The **audience** you would like

- Have read all your earlier papers
- Thoroughly understand all the relevant theory of cartesian closed endomorphic bifunctors
- Are all agog to hear about the latest developments in your work
- Are fresh, alert, and ready for action

Your **actual** audience...



The audience you get

- Have never heard of you
- Have heard of bifunctors, but wish they hadn't
- Have 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

What to put in

1

Motivation
(20%)

2

Your key idea
(80%)

3

There is no 3

Motivation

You have two minutes to engage your audience before they start to doze.

They are thinking...

- Why should I tune into this talk?
- What is the problem?
- Why is it an interesting problem?
- Does this talk describe a worthwhile advance?

Motivation

You have 2 minutes to answer these questions. Don't waste those 2 minutes.

Example: Java class files are large (brief figures), and get sent over the network. Can we use language-aware compression to shrink them? Yes, and I'm going to show you how we can do 50% better than the best generic zipping technology

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.

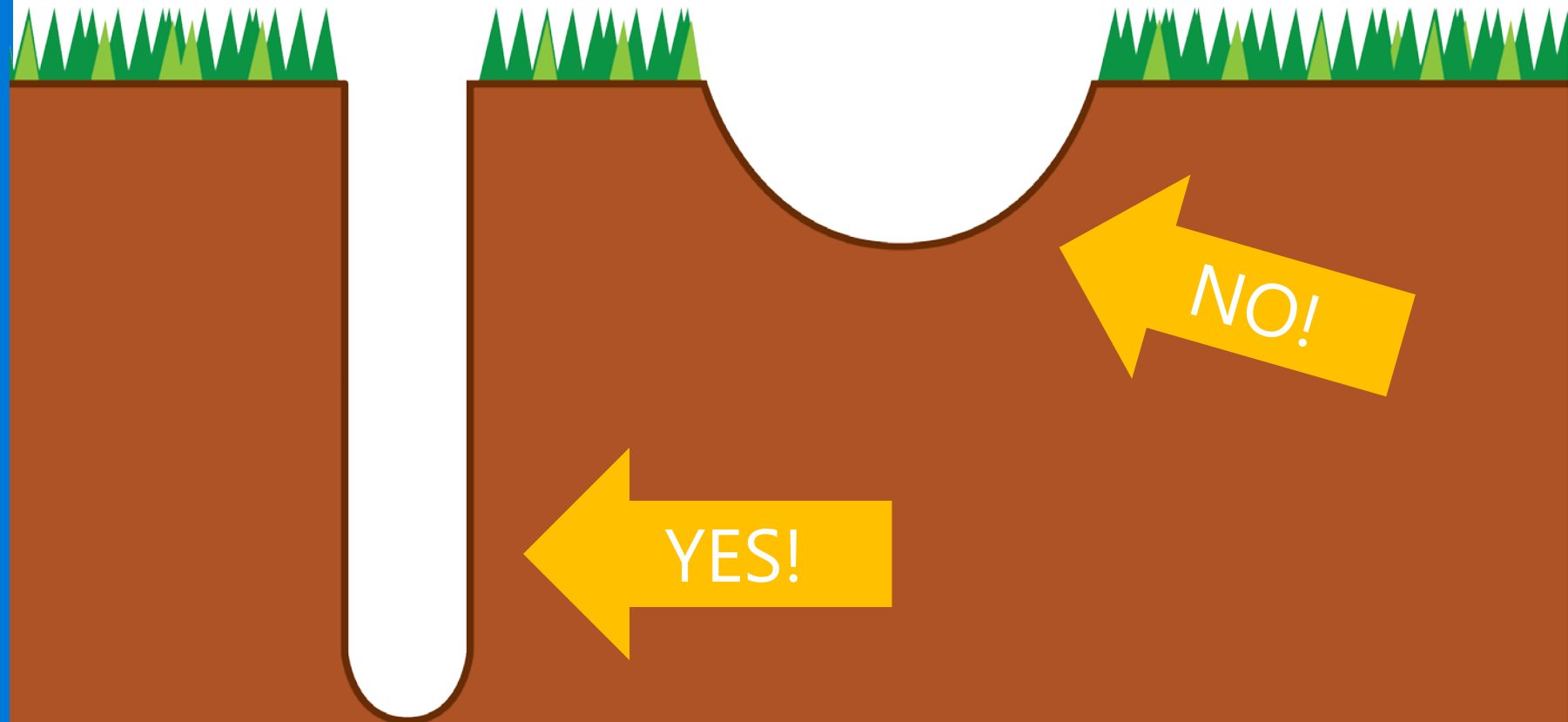
Your key idea

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

- You must identify a key idea.
“What I did this summer” is No Good.
- Be specific.
Don’t leave your audience to figure it out for themselves.
- Be absolutely specific.
Say “If you remember nothing else, remember this.”
- Organise your talk around this specific goal.
Ruthlessly prune material that is irrelevant to this goal.

Narrow,
deep beats
wide,
shallow

- Avoid shallow overviews at all costs
- Cut to the chase: the technical “meat”
- It’s ok to cover only part of your paper



Examples are your main weapon

When time is short,
omit the general case,
not the example.

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

Exceptions in Haskell?

Exceptions are to do with control flow. There is no control flow in a lazy functional program.

Solution 1: use data values to carry exceptions

```
Data Maybe a = nothing
                | Just a

Lookup : : Name -> Dictionary -> Maybe Address
```

Often this is Just The Right Thing
[Spivey 1990, Wadler "list of successes"]

What to leave out

Outline of my talk

- Background
- The FLUGOL system
- Shortcomings of FLUGOL
- Overview of synthetic epimorphisms
- π -reducible decidability of the pseudo-curried fragment under the Snezkowski 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.

Worse, since your audience only gives you 2 minutes before dozing, you’ve just lost them

- But maybe put up an outline for orientation after your motivation
- ...and signposts at pause points during the talk

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

Do not
present
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)
- Praise the opposition
"X's very interesting work does Y; I have extended it to do Z"

Technical detail

$$\begin{array}{c} \frac{}{\Gamma \vdash k : \tau_k} \quad \frac{\Gamma \cup \{x : \tau\} \vdash e : \tau'}{\Gamma \vdash \lambda x. e : \tau \rightarrow \tau'} \quad \frac{\Gamma \vdash e_1 : \text{ST } \tau^\circ \tau \quad \Gamma \vdash e_2 : \tau \rightarrow \text{ST } \tau^\circ \tau'}{\Gamma \vdash e_1 \gg e_2 : \text{ST } \tau^\circ \tau'} \\ \\ \frac{\Gamma \vdash e : \tau}{\Gamma \vdash \text{returnST } e : \text{ST } \tau^\circ \tau} \quad \frac{\Gamma \vdash e : \tau}{\Gamma \vdash \text{newVar } e : \text{ST } \tau^\circ (\text{MutVar } \tau^\circ \tau)} \quad \frac{\Gamma \vdash e : \text{MutVar } \tau^\circ \tau}{\Gamma \vdash \text{readVar } e : \text{ST } \tau^\circ \tau} \\ \\ \frac{\Gamma \vdash e_1 : \text{MutVar } \tau^\circ \tau \quad \Gamma \vdash e_2 : \tau}{\Gamma \vdash \text{writeVar } e_1 e_2 : \text{ST } \tau^\circ \text{Unit}} \quad \frac{}{\Gamma \cup \{x : \forall \alpha_i. \tau\} \vdash x : \tau[\tau_i/\alpha_i]} \\ \\ \frac{\Gamma \vdash e : \tau' \rightarrow \tau \quad \Gamma \vdash e' : \tau'}{\Gamma \vdash e e' : \tau} \quad \frac{\Gamma \vdash e : \text{ST } \alpha^\circ \tau \quad \alpha^\circ \notin FV(\Gamma, \tau)}{\Gamma \vdash \text{runST } e : \tau} \\ \\ \frac{\forall j. \Gamma \cup \{x_i : \tau_i\}_i \vdash e_j : \tau_j \quad \Gamma \cup \{x_i : \forall \alpha_{j_i}. \tau_i\}_i \vdash e' : \tau'}{\Gamma \vdash \text{let } \{x_i = e_i\}_i \text{ in } e' : \tau'} \quad \alpha_{j_i} \in FV(\tau_i) - FV(\Gamma) \end{array}$$

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
- By all means have backup slides to use in response to questions

Presenting your talk

How to present your talk

Your most potent weapon, by far, is your

enthusiasm!

Enthusiasm

- If you do not seem excited by your idea, why should the audience be?
- Enthusiasm makes people dramatically more receptive
- It gets you loosened up, breathing, moving around

Write your slides the night before



(...or at least, polish it then)

- Your talk absolutely 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

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”

The jelly effect

If you are anything like me, you will experience apparently severe pre-talk symptoms

- Inability to breathe
- Inability to stand up (legs give way)
- Inability to operate brain



What to do about it

You are not a wimp.
Everyone feels this way.

- Deep breathing during previous talk
- Script your first few sentences precisely (=> no brain required)
- Move around a lot, use large gestures, wave your arms, stand on chairs
- Go to the loo first

Being seen

- Face the audience, not the screen
- Know your material
- Put your laptop in front of you, screen towards you
- Don't point much, but when you do, point at the screen, not at your laptop

Being heard

- 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 (better still, more than one)
- Watch audience for questions...

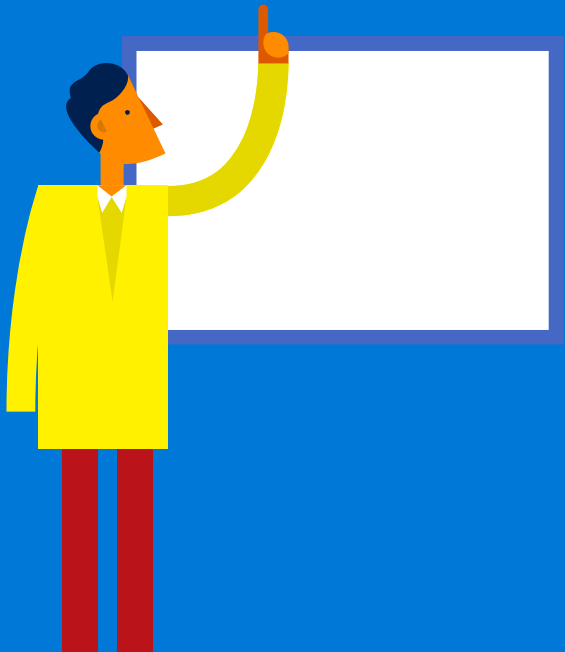
Questions

- Questions are not a problem. Questions are a golden golden golden opportunity to connect with your audience.
- Specifically encourage questions during your talk: pause briefly now and then, ask for questions
- Be prepared to truncate your talk if you run out of time. Better to connect, and not to present all your material

Being a good audience member

- Eye contact with speaker
- Nod frequently
- Ask questions.
 - Don't wait for the speaker to invite questions; ask
 - Start doing so the moment you lose contact with the talk. The rest of the audience will thank you for it.
 - Stop when you sense that you are beginning to de-rail the entire talk.

Presenting your slides



- Use a wireless presenter gizmo
- Test that your laptop works with the projector, in advance
- Laptops break: leave a backup copy on the web; bring a backup copy on a disk or USB key

Presenting your slides

A very annoying technique

- is to reveal
- your points
- one
- by one
- by one, unless...
- there is a punch line

Presenting your slides

Use animation effects

very

very

very

very

very

very

very

sparingly

Finishing

Absolutely without fail,
finish on time.

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

Conclusion: there is hope

The general standard is often low.

You don't have to be outstanding to stand out.

You will attend 50x as many talks as you give. Watch other people's talks intelligently, and pick up ideas for what to do and what to avoid.

www.microsoft.com/research/people/simonpj

What your talk is for

Your paper
= the beef

Your talk
= the beef
advertisement

Do not confuse
the two.



Do it! Do it!
Do it!

Write a paper, and give a talk, about **any idea**, no matter how weedy and insignificant it may seem to you.

Good papers and talks are a fundamental part of research excellence

- Invest time
- Learn skills
- Practice

Research is communication

The greatest ideas are worthless if you keep them to yourself.

Your papers and talks

- Crystallise your ideas
- Communicate them to others
- Get feedback
- Build relationships
- (And garner research brownie points)

