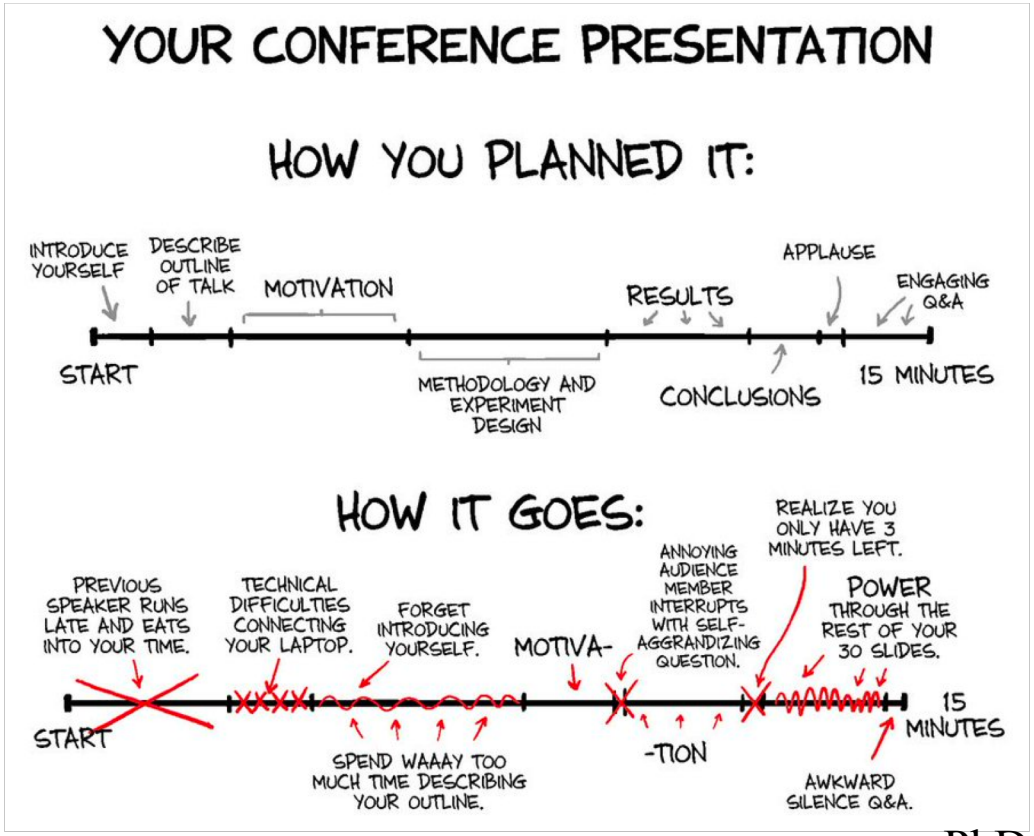
How to give a great research talk

To do …



PhD comics

Based on Simon Peyton Jones' talk, MSR Cambridge
Jean-Luc Doumont's *Tree, maps and theorems*

Why

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
- ... tell them everything you know about a topic
- ... present all the technical details

The purpose of your talk

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

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

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

Designing it

To keep in mind

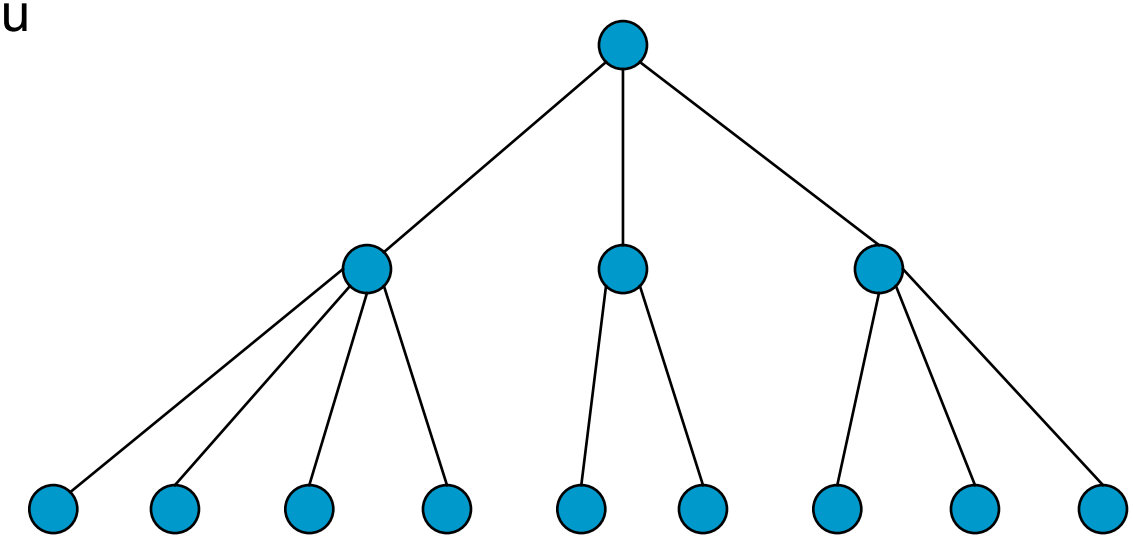
- Presentations are synchronous
  - Unlike a doc, they impose a sequence and rhythm
  - Audience cannot skip around
  - They have few visual clues to the structure
- A different design strategy
  - Message with convincing (**not detailed**) delivery
  - A single, main message
  - Offer clues to the structure (not with an outline slide)
    - Remind them where they are

Designing your presentation

Main message: what you want them to remember

Main points: what supports this message

Subpoints



- Clear structure, focused presentation
- Also great when you run out of time

Three parts: Opening | Body | Closing

- Opening – like abstract of a document
  - Attention getter
  - Need – Motivation, why something has to be done
  - Task – Who did what
  - Main message – Take-home message, stated upfront
- Body
  - {Point}
- Conclusion
- (acknowledgements here, not to distract)

Attention getter

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?

Attention getter

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

- **Example:** Synchronization 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
- Be absolutely specific
  - Say “If you remember nothing else, remember this”
- Organise your talk around this specific goal
  - Ruthlessly prune material that’s irrelevant to this

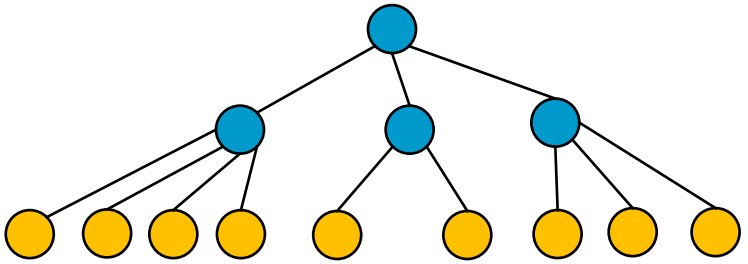
Map and signposts

- Opening
  - Attention getter
  - Need
  - Task
  - Main message
  - Preview – Of what's to left, not what's been covered
- Body
  - {Point | Transition}
- Review – Reminds them of the argument, leads them into the …
- Conclusion

Preview, transitions and reviews talk about the topic ("the system has three advantages"), not the presenter ("I will present three advantages")

Designing your presentation

- Draft *not* in PowerPoint/slides
  - To focus on what you need, rather than on trying to use what you have
- A slide per subpoint
- The subpoint message as heading
  - Ideally every slide conveys a message
  - *So what* (Submarine network is growing), rather than *what* (Number of submarine cables per year)



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

- 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

What to leave out

What to leave out

~~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 include preview after your motivation
- …and signposts at pause points during the talk

What to leave out

~~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

But

- You must know it; ready to answer questions
- Acknowledge co-authors (title slide), and pre-cursors
- Praise the opposition

What to leave out

~~Technical detail~~

$$\frac{}{\Gamma \vdash k : \tau_k} \qquad \frac{\Gamma \cup \{x : \tau\} \vdash e : \tau'}{\Gamma \vdash \lambda x.e : \tau \to \tau'} \qquad \frac{\Gamma \vdash e_1 : \mathtt{ST}\ \tau^\circ\ \tau \qquad \Gamma \vdash e_2 : \tau \to \mathtt{ST}\ \tau^\circ\ \tau'}{\Gamma \vdash e_1\ \mathtt{>>=}\ e_2 : \mathtt{ST}\ \tau^\circ\ \tau'}$$

$$\frac{\Gamma \vdash e : \tau}{\Gamma \vdash \mathtt{returnST}\ e : \mathtt{ST}\ \tau^\circ\ \tau} \qquad \frac{\Gamma \vdash e : \tau}{\Gamma \vdash \mathtt{newVar}\ e : \mathtt{ST}\ \tau^\circ\ (\mathtt{MutVar}\ \tau^\circ\ \tau)} \qquad \frac{\Gamma \vdash e : \mathtt{MutVar}\ \tau^\circ\ \tau}{\Gamma \vdash \mathtt{readVar}\ e : \mathtt{ST}\ \tau^\circ\ \tau}$$

$$\frac{\Gamma \vdash e_1 : \mathtt{MutVar}\ \tau^\circ\ \tau \qquad \Gamma \vdash e_2 : \tau}{\Gamma \vdash \mathtt{writeVar}\ e_1\ e_2 : \mathtt{ST}\ \tau^\circ\ \mathtt{Unit}} \qquad \frac{}{\Gamma \cup \{x : \forall \alpha_i.\tau\} \vdash x : \tau[\tau_i/\alpha_i]}$$

$$\frac{\Gamma \vdash e : \tau' \to \tau \qquad \Gamma \vdash e' : \tau'}{\Gamma \vdash e\ e' : \tau} \qquad \frac{\Gamma \vdash e : \mathtt{ST}\ \alpha^\circ\ \tau}{\Gamma \vdash \mathtt{runST}\ e : \tau}\ \alpha^\circ \notin FV(\Gamma, \tau)$$

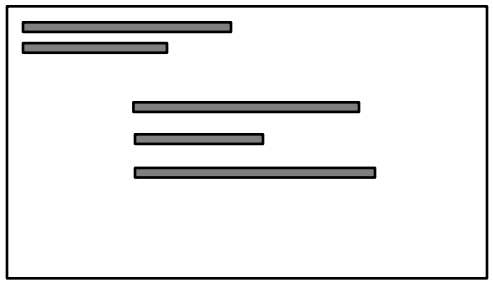
$$\frac{\forall j.\Gamma \cup \{x_i : \tau_i\}_i \vdash e_j : \tau_j \qquad \Gamma \cup \{x_i : \forall \alpha_{j_i}.\tau_i\}_i \vdash e' : \tau'}{\Gamma \vdash \mathtt{let}\ \{x_i = e_i\}_i\ \mathtt{in}\ e' : \tau'}\ \alpha_{j_i} \in FV(\tau_i) - FV(\Gamma)$$

Figure 1. Typing Rules

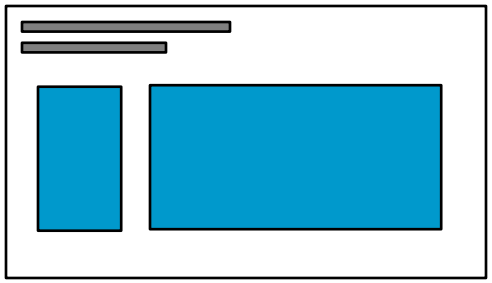
- Specific aspects only; paper for the details
- Backup slides to use in response to questions

Constructing the slides – a few comments

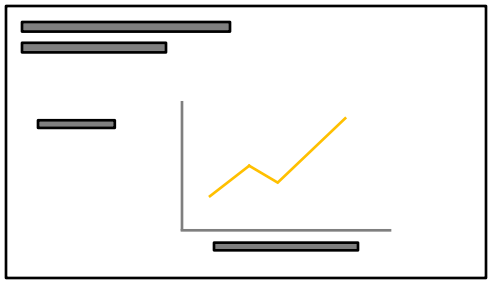
- Think minimalistic
  - Less text; use animation very sparingly
  - One typeface (sans-serif), few sizes
  - First design in B&W, then add color sparingly
  - Avoid footers
- Balanced the content
  - Space, images, …



Two lines heading; wide left margin



Two image, align left, coordinated sizes



Left-aligned, label in margin

Presenting your talk

How to present your work

- Your most potent weapon

Enthusiasm

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

Before the talk

- Rehearse multiple times, with an audience
- Practice the night before – your talk absolutely must be fresh in your mind
- If you get too too nervous
  - Deep breathing during previous talk
  - Script your first few sentences precisely
  - Move around a lot, use large gestures, …
- Test that laptop/projector works, in advance
- Laptops break – backup copy on the web *and* USB key

During your talk

- Minimize signal-to-noise ratio, avoid
  - Clothing, jewelry …
  - Filler words (“um”, “d’you know”, …)
  - Rhetorical questions (“I will mention advantages only briefly”, “I have drawn the evolution in this graph”)
- Use a wireless presenter gizmo
- Don’t point much, and if you do, point to the screen (not your laptop), **no laser**
  - Moves the attention away from you

During your talk

- Face the audience, not the screen
  - Make sure you both are visible
- Speak to the back of the room (be heard)
- Coordinate your talk and the slides
- Identify a *nodder* and talk to him/her, even better a few of them
- Read/adapt to your audience in real-time

Encourage questions

- It's an opportunity to engage with your audience
- Encourage them
  - Pause frequently
  - Ask for questions
- Be ready to cut your talk short (fractal format)
  - Better connecting than covering everything

Answering questions

- Don’t rush
  - Listen to the question
  - Repeat/rephrase it,
  - Think to construct and answer
  - Answer everyone (eye contact)
- Push questions with long answers offline
- Hostile questions
  - Remain calm
  - Pause before answering (calming the audience)
  - Acknowledge the need

Finishing (on time)

- **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”)

Research is communication

- Good papers and talks are a fundamental part of research excellence
- Crystallise your ideas
- Communicate them to others
- Get feedback
- Build relationships
- (And garner research brownie points)

The general standard is often low.
You don't have to be outstanding to stand out.