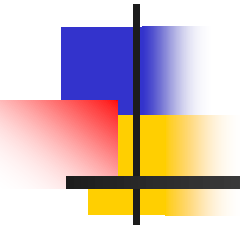


Giving a research talk

Bryan Pardo

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

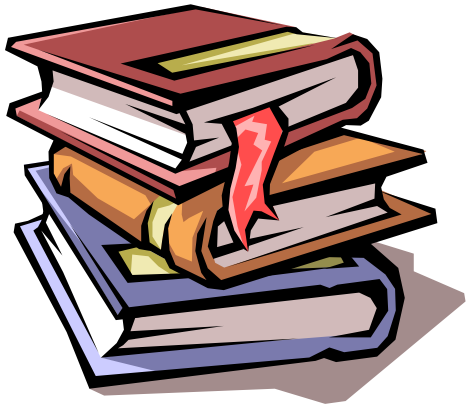
A good talk…

- 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



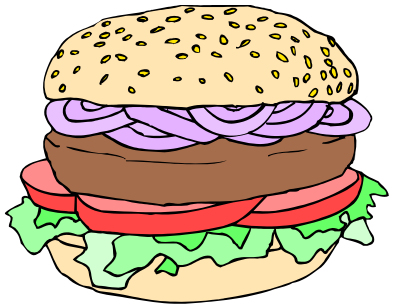
The purpose of your talk…

is:

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

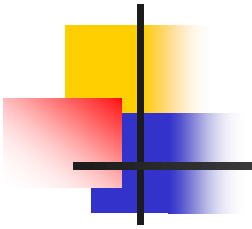
What your talk is for

Your paper = **The beef**



Your talk = **The beef advertisment**

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…

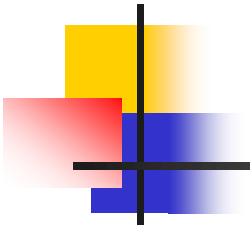
- Have never heard of you
- Have heard of quantum Grassmanians but wish they hadn't
- Just had lunch and are ready for a doze

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**

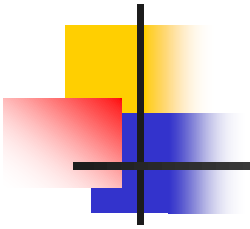
   Weld two bikes together side-by-side.

5. **Proof it works**

   Study shows 15% fewer winter accidents.

The topic area

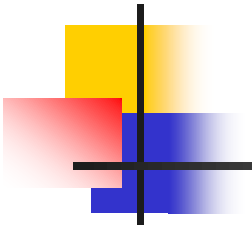
- This is the BIG topic area, not the specific detailed issue.
  - Don't talk about aluminum welding techniques if your big topic area is approaches to alternate transportation



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

Proof it works…should be

- 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

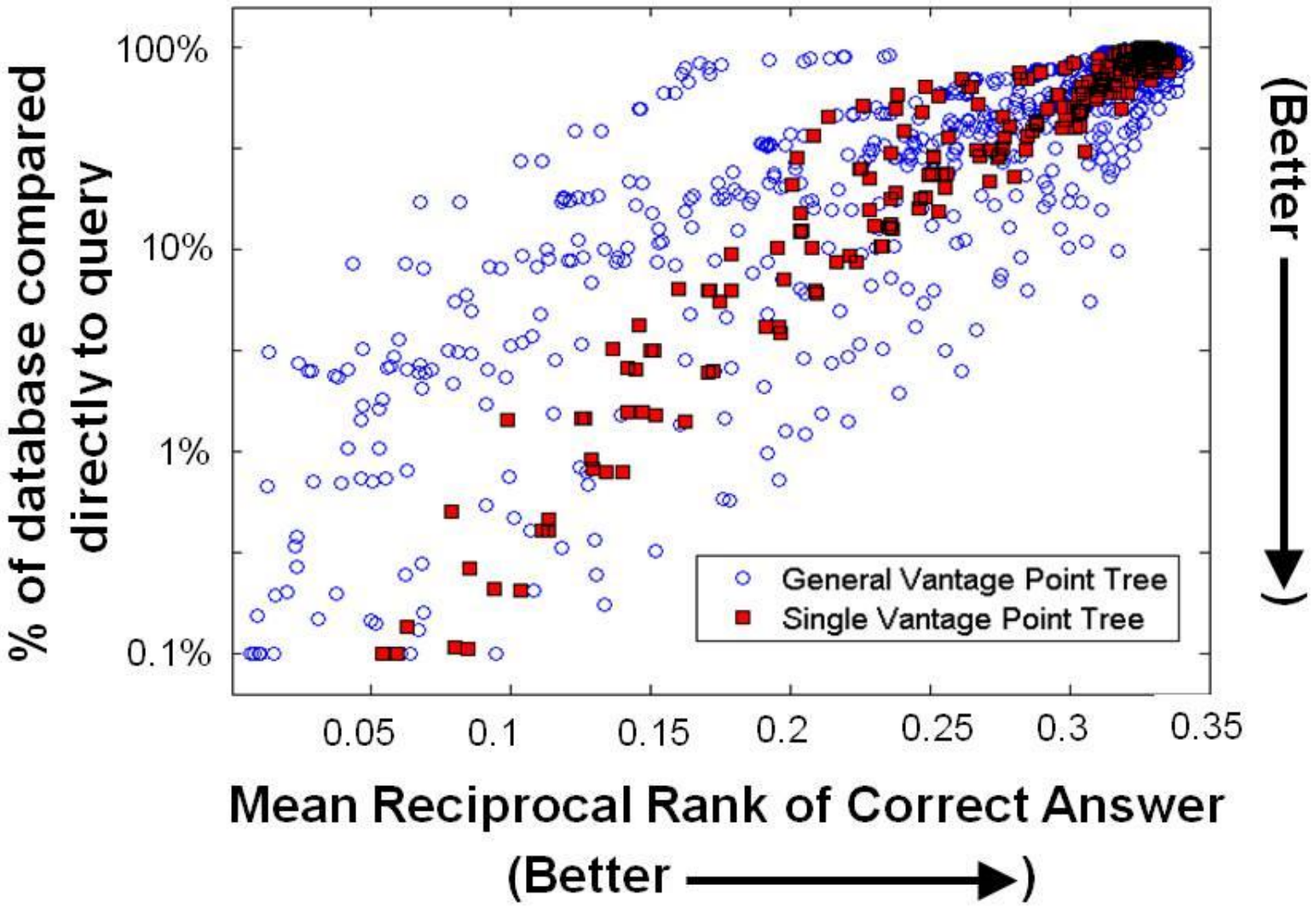
Proof it works…should be

- **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

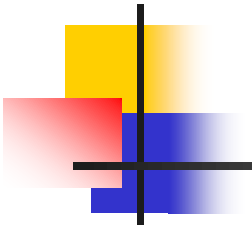
What's good/bad here?



What to leave out

Outline of my talk

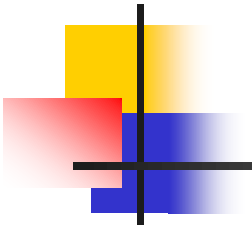
- Background
- The FLUGOL system
- Shortcomings of FLUGOL
- Overview of synthetic epimorphisms
- π-reducible decidability of the pseudo-curried fragment under the Snezkovwski invariant in FLUGOL
- Benchmark results
- Related work
- Conclusions and further work



No outline!

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

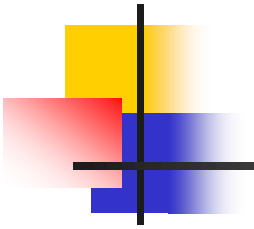
- But maybe put up an outline for orientation after your motivation
- …and signposts at pause points during the talk



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

Mathy,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

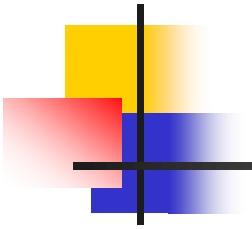
Omit technical details

- 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

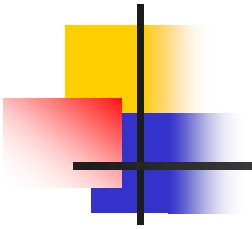
Presenting your talk



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"

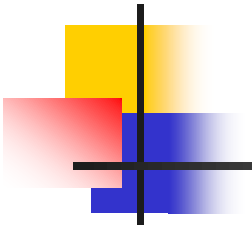
How to present your talk

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

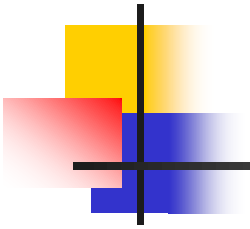
- A golden opportunity to connect with the audience
- Answer questions briefly
- If a questioner wants to engage in a dialog:
  - Suggest you speak after the talk

Presenting your slides

Use animation effects

very very very very very very

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")