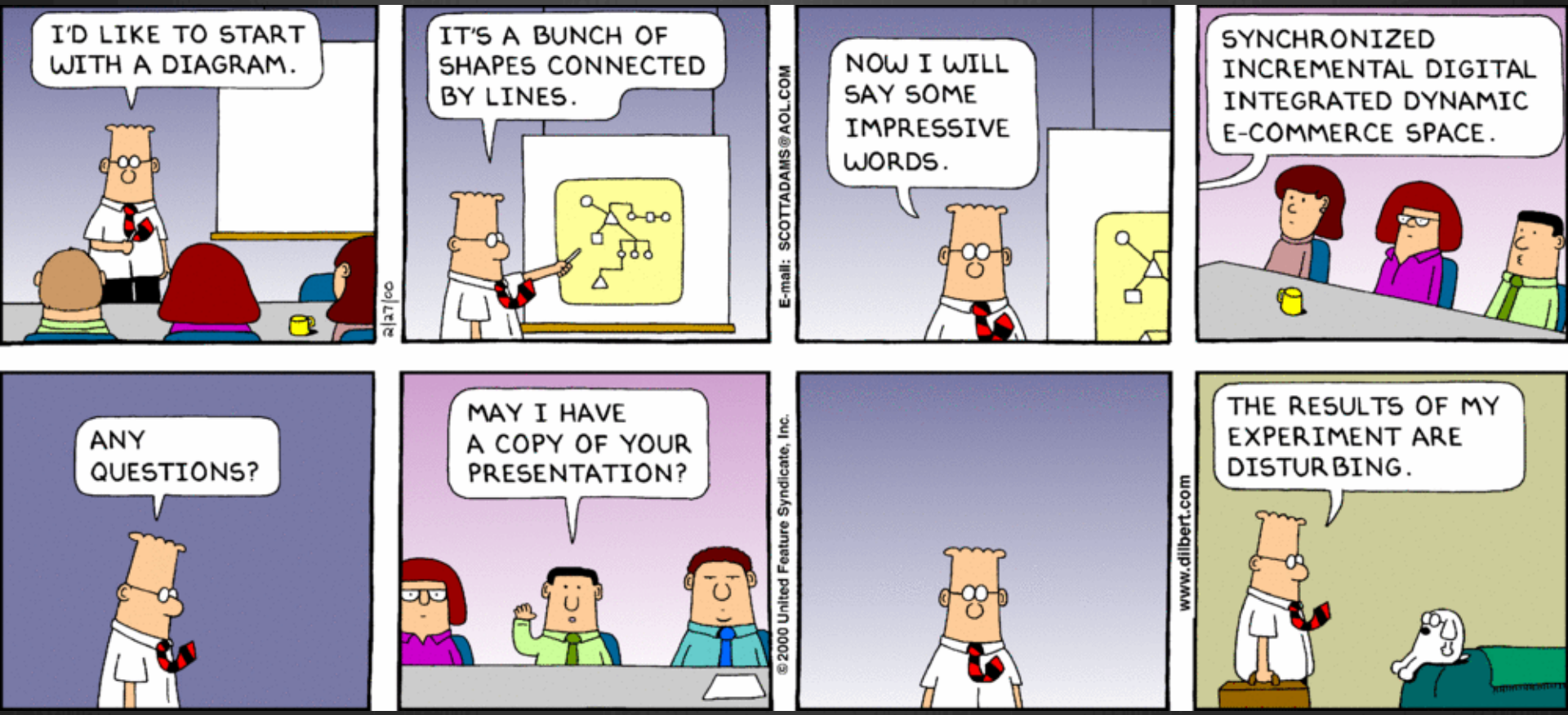
How to give a good research talk

David Sands




Presentation Warning
Speaker attempting to give a talk about giving a talk.
Exit
Continue Anyway

How to give a good research talk

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Abstract

Giving a good research talk is not easy. We try to identify some things which we have found helpful, in the hope that they may be useful to you.

This paper appears in SIGPLAN Notices 28(11) (Nov 1993).

1 What this paper is about

By a "research talk" we mean a presentation of 30-60 minutes, given to a group of people who know much about your particular area.

What we have to say is quite different from what business people are often taught, but perhaps that's due mainly to a difference in the style of presentation needed for technical material.

Papers like this one often tend to consist mainly of "motherhood" statements, with which nobody could possibly disagree (such as "prepare well"), and thereby end up with little real punch. We have tried to avoid this, partly by deliberately overstating some things (the title, for example) in order to make our points more vividly.

We make no claim to have all the answers; rather, we have simply tried to write down suggestions which have worked for us in the hope that they may be useful to you. Everyone is dif-

ask are these:

- *Who is my primary audience?*
- *If someone remembers only one thing from my talk, what would I like it to be?.*

If you have the answer to these questions pinned [illegible] you can use them as criteria when deciding what to say and what to omit. And don't forget to tell the audience the answer to the second question!

2 Structure

Most of us do research by trying to solve a series of problems, finding some suitable framework in which to solve them, and then generalising and abstracting our solution. For example, if the problem is to find out whether a function evaluates its argument, then a suitable framework might be denotational semantics, and a generalisation might be abstract interpretation.

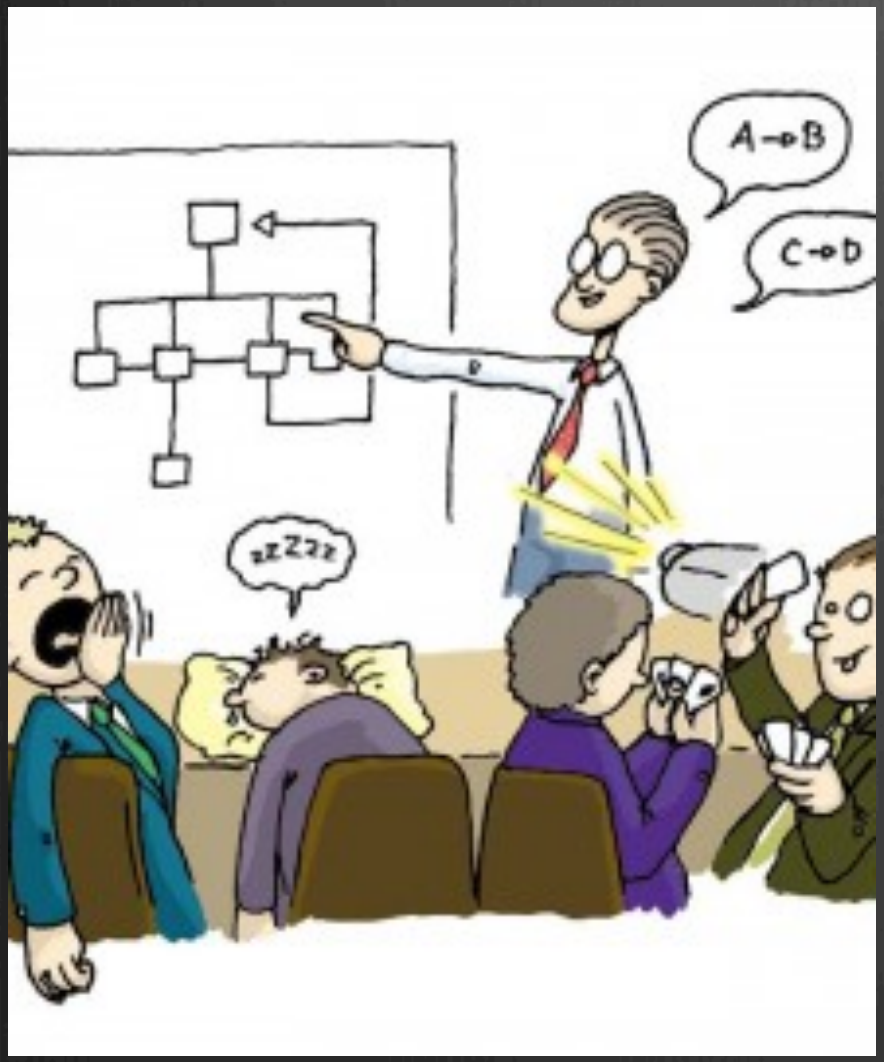
The Awful Trap is to present only the framework and the abstraction, leaving out the motivating examples which you used to guide your work. Many talks are far too abstract. They present slide upon slide of impressive-looking squiggles, but leave the audience none the wiser.

It is utterly vital to present examples which demonstrate the points you are trying to make. When you give a definition of a property, or a mathematical structure, or some new notation,

Based on a 1993 paper by John Hughes (Chalmers), Simon Peyton Jones (MS Research), and John Launchbury (Galois Inc)

Slides liberally borrowed and adapted from SPJ's presentations

In a nutshell



There are too many bad academic talks

Some simple advice can help you

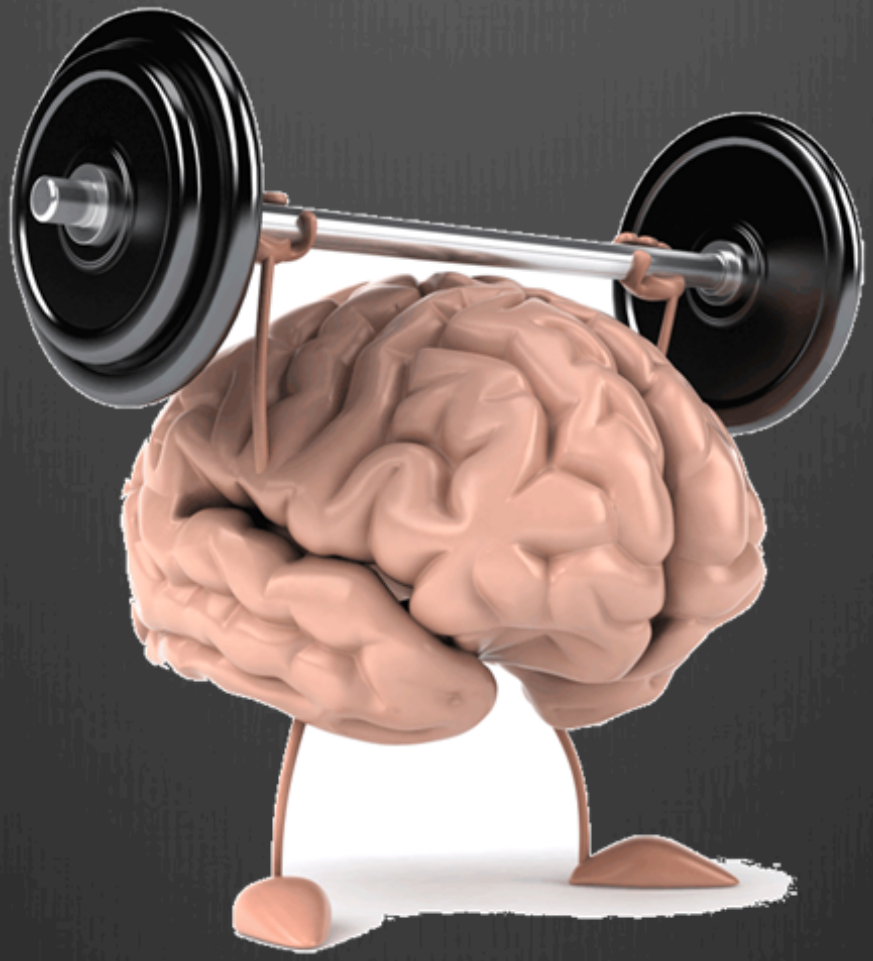
- stand out
- continuously improve


GIVING A GOOD TALK
1. WHAT'S IT FOR
2. WHAT TO PUT IN IT
3. HOW TO PRESENT IT

1. What is the talk for

Photo: GP, 2011-09-11

The purpose of your talk…



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To give your audience an **intuitive feel** for the main idea

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To make them foam at the mouth with eagerness to read the paper

To engage, excite, provoke them

The audience you would like

The audience you would like

Your Actual Audience

- Have read all the earlier papers

Never heard of you

- Thoroughly understand all the relevant theory of *cartesian closed endomorphic bifunctors*

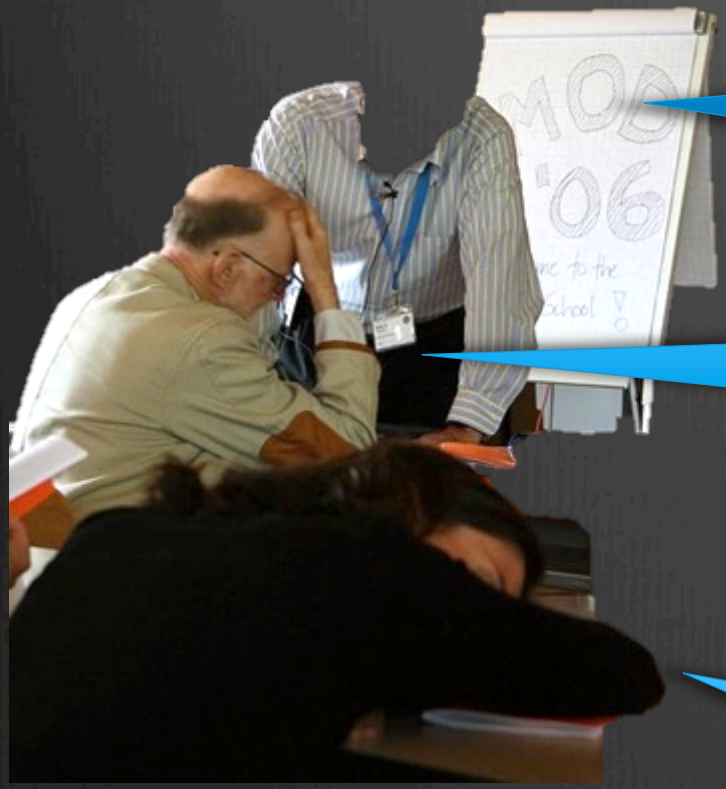
Have seen it. Wish they hadn't

- Are all agog to hear about the latest developments in the work

Like, whatever

- Are fresh, alert, and ready for action

Mmm wine with lunch...
Zzzzz...



Butler Lampson

Turing Award Winner 1990

Sir Tony Hoare

Turing Award Winner 1980

Your Audience

Photo: Aslan Askarov

Marktoberdorf summer school ‘06

Your mission


GIVING A GOOD TALK
1. WHAT'S IT FOR
2. WHAT TO PUT IN IT
3. HOW TO PRESENT IT

What to put in

1. Motivation (20%)
2. The key idea (80%)
3. There is no 3

Motivation

You have 2 minutes to engage your audience before they start to doze

Why should I tune into this talk?

What is the problem?

Why is it an interesting problem?

Homework Exercise

Find an on-line academic talk (not a TED talk) which you think illustrates this well.

Share with the class

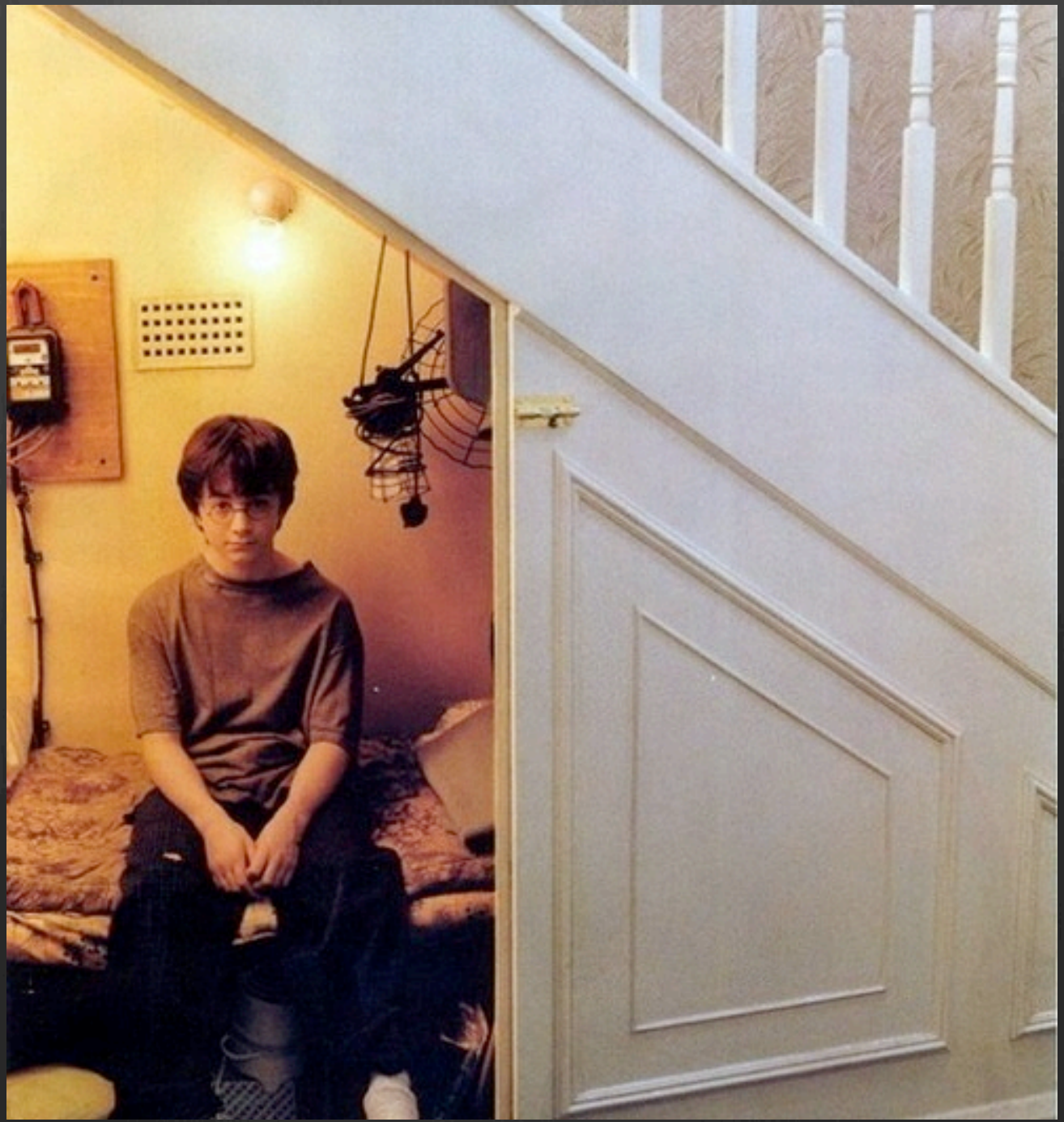
Motivation: Examples

Motivation: Examples

Example: Parallelization of C/C++ legacy code is difficult, labor-intensive and error-prone.

Nema Labs has developed a methodology that allows programmers to parallelize ordinary C/C++ code without reasoning about parallelism.

The motivation was the beginning of the story



The Middle

The key idea

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

Examples are your chief weapon

- Motivate
- Convey Intuition
- Illustrate ideas in action
- Show extreme cases
- Highlight shortcomings

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

Examples are your chief weapon

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

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

Technical detail

$$\frac{}{\Lambda \vdash n : \bot} \qquad \frac{\vec{a} \subseteq \Lambda \quad \forall a \in \vec{a}.\, pol(a) \sqsubseteq pol(x[\vec{a}])}{\Lambda \vdash x[\vec{a}] : pol(x[\vec{a}])} \qquad \frac{\Lambda \vdash e_1 : r_1 \quad \Lambda \vdash e_2 : r_2}{\Lambda \vdash e_1 \oplus e_2 : r_1 \sqcup r_2}$$

$$\frac{\vec{a} \subseteq \Lambda}{\Lambda; \Sigma \vdash \texttt{open}\ \sigma(\vec{a}) \rightsquigarrow pol(\sigma), \Sigma \cup \{\sigma(\vec{a})\}} \qquad \frac{\vec{a} \subseteq \Lambda}{\Lambda; \Sigma \vdash \texttt{close}\ \sigma(\vec{a}) \rightsquigarrow pol(\sigma), \Sigma \setminus \{\sigma(\vec{b}) \mid \vec{a} \simeq \vec{b}\}}$$

$$\frac{}{\Lambda; \Sigma \vdash \texttt{skip} \rightsquigarrow \top, \Sigma} \qquad \frac{\Lambda \vdash e : r \quad r(\Sigma) \sqsubseteq pol(x[\vec{a}]) \quad \vec{a} \subseteq \Lambda}{\Lambda; \Sigma \vdash x[\vec{a}] := e \rightsquigarrow pol(x[\vec{a}]), \Sigma}$$

$$\frac{\Lambda \vdash e : r \quad \Lambda; \Sigma \vdash c_i \rightsquigarrow w_i, \Sigma_i \quad r \sqsubseteq w_1 \sqcap w_2}{\Lambda; \Sigma \vdash \texttt{if}\ e\ \texttt{then}\ c_1\ \texttt{else}\ c_2 \rightsquigarrow w_1 \sqcap w_2, \Sigma_1 \cap \Sigma_2} \qquad \frac{\Lambda \vdash e : r \quad \Lambda; \Sigma \cap \Sigma' \vdash c \rightsquigarrow w, \Sigma' \quad r \sqsubseteq w}{\Lambda; \Sigma \vdash \texttt{while}\ (e)\ c \rightsquigarrow w, \Sigma' \cap \Sigma}$$

$$\frac{\Lambda; \Sigma \vdash c_1 \rightsquigarrow w_1, \Sigma_1 \quad \Lambda; \Sigma_1 \vdash c_2 \rightsquigarrow w_2, \Sigma_2}{\Lambda; \Sigma \vdash c_1; c_2 \rightsquigarrow w_1 \sqcap w_2, \Sigma_2}$$

$$\frac{\Lambda; \Sigma \cup \{\sigma(\vec{a})\} \vdash c_1 \rightsquigarrow w_1, \Sigma_1 \quad \Lambda; \Sigma \vdash c_2 \rightsquigarrow w_2, \Sigma_2 \quad pol(\sigma) \sqsubseteq w_1 \sqcap w_2 \quad \forall a \in \vec{a}.\, pol(a) \sqsubseteq pol(\sigma)}{\Lambda; \Sigma \vdash \texttt{when}\ \sigma(\vec{a})\ \texttt{do}\ c_1\ \texttt{else}\ c_2 \rightsquigarrow w_1 \sqcap w_2, \Sigma_1 \cap \Sigma_2}$$

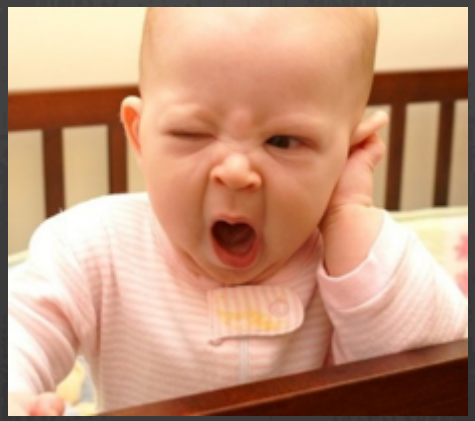
$$\frac{\Lambda \cup \vec{a}; \Sigma \cap \Sigma' \vdash c \rightsquigarrow w, \Sigma' \quad pol(\sigma) \sqsubseteq \forall \vec{a}.\, w \quad \vec{a} \cap \Lambda = \varnothing}{\Lambda; \Sigma \vdash \texttt{forall}\ \sigma(\vec{a})\ \texttt{do}\ c \rightsquigarrow pol(\sigma), \Sigma' \cap \Sigma \setminus \{\sigma(\vec{b}) \mid \vec{a} \cap \vec{b} \neq \varnothing\}}$$

$$\frac{\Lambda \cup \{a\}; \Sigma \vdash c \rightsquigarrow w, \Sigma'}{\Lambda; \Sigma \vdash \texttt{newactor}\ a\ \texttt{in}\ c \rightsquigarrow \bot, \Sigma' \setminus \{\sigma(\vec{b}) \mid a \in \vec{b}\}} \qquad \frac{\Lambda; \Sigma \vdash c \rightsquigarrow w, \Sigma'}{\Lambda; \Sigma \vdash c}\ \text{(Top level judgement)}$$

Figure 4. Flow Lock Type System

Omit technical details

Clouds of notation will send your audience to sleep

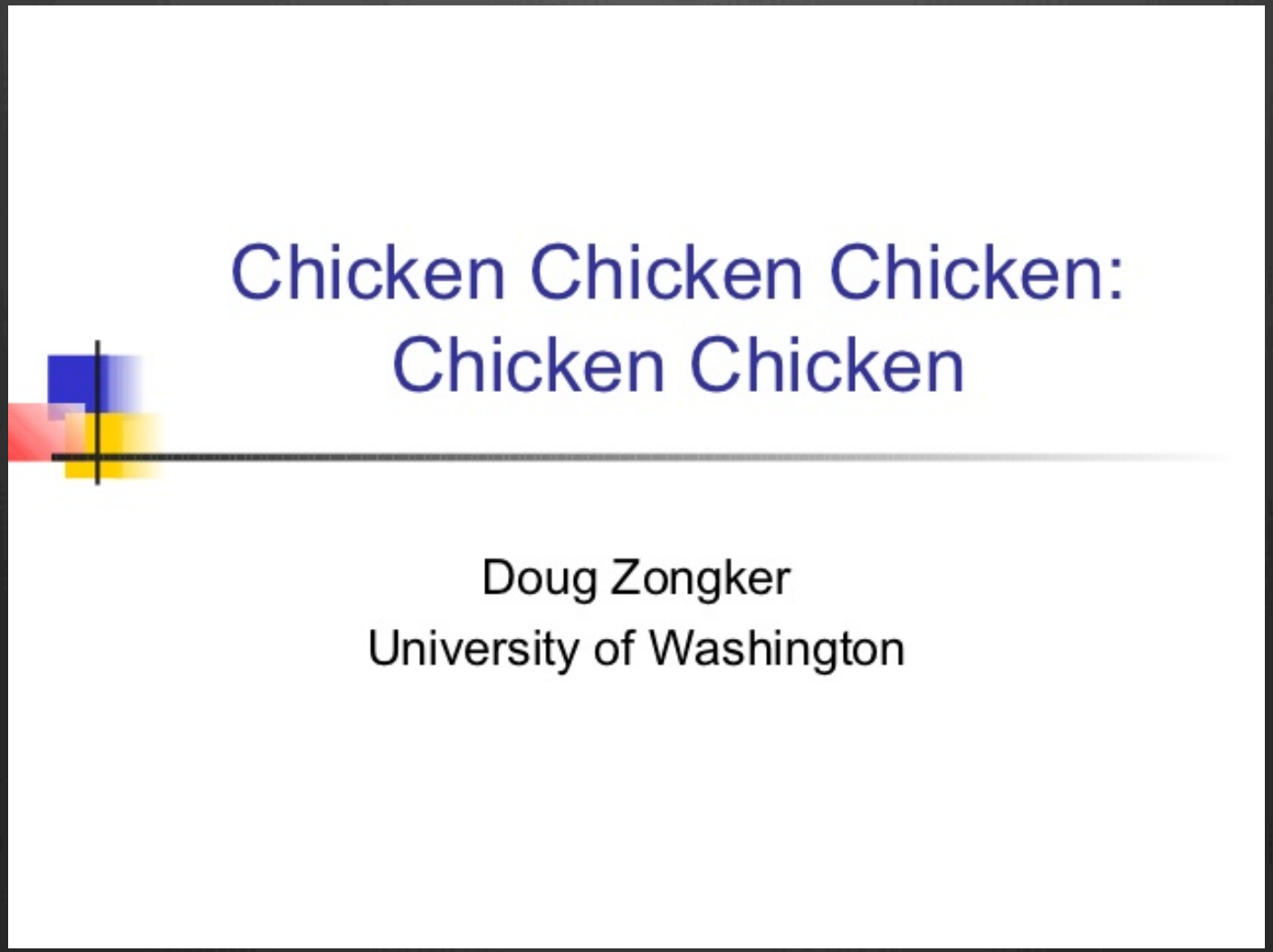


Omit technical details

Present specific aspects only; refer to the paper/report for the details

Backup slides for comfort

3. Presenting your talk



Death by powerpoint

Do not apologise

"I didn't have time to prepare this talk properly"

Do not apologise

“My computer broke down, so I don’t have the results I expected”

Do not apologise

“I don’t have time to tell you about this”

Do not apologise

“I don’t feel qualified to address this audience”

Preparation [1993]

Use an overhead projector

Write your overhead slides by hand

Don't start writing slides too early

…write the slides the night before

Start Preparation Early

Practice your talk

Give a trial run for a friendly audience

Improve, improve, improve

…and Finish Late

Keep what you want to say fresh in your mind

Make connections to other talks

Fault tolerance

Backups

Test the equipment

Grace under pressure

Laser wobbles

Fault tolerance

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How to present your talk

By far the most important thing is to

be enthusiastic

This is ... this is
really the slide

Enthusiasm

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

- **The hard part: you can’t really fake it**

The jelly effect

What to do about the n-n-nerves

Script your first few sentences precisely

Move around a lot, use large gestures, wave your arms, stand on chairs

Being seen, being heard

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

And remember, it is never a good idea to put lots and lots of text on your slide. It's hard to read for the audience. Its probably even worse if you just plan to read it out loud. Well actually, you will probably get half way through reading it and then decide that maybe it wasn't such a good idea after all. Er then what should I do. Maybe just be quiet for a bit so you can read it yourself. The audience has already opened their laptop and started to read their email.

Animate Judiciously

Blah blah

- Blah
- Blah
- Blah Blah

Fonts & Readability

Never, ever, go below 24 point font

- This is what 24 point looks like on *this* projector

Feel free to make the font size considerably larger.

If possible, adjust the presentation to the specific environment

Colours

Take care with choice of colours and backgrounds

5% of your audience are likely to be colour blind

Haha what a bunch of losers

Mechanics of Slide Production

Powerpoint, Prezi, ooffice, latex, notepad…?

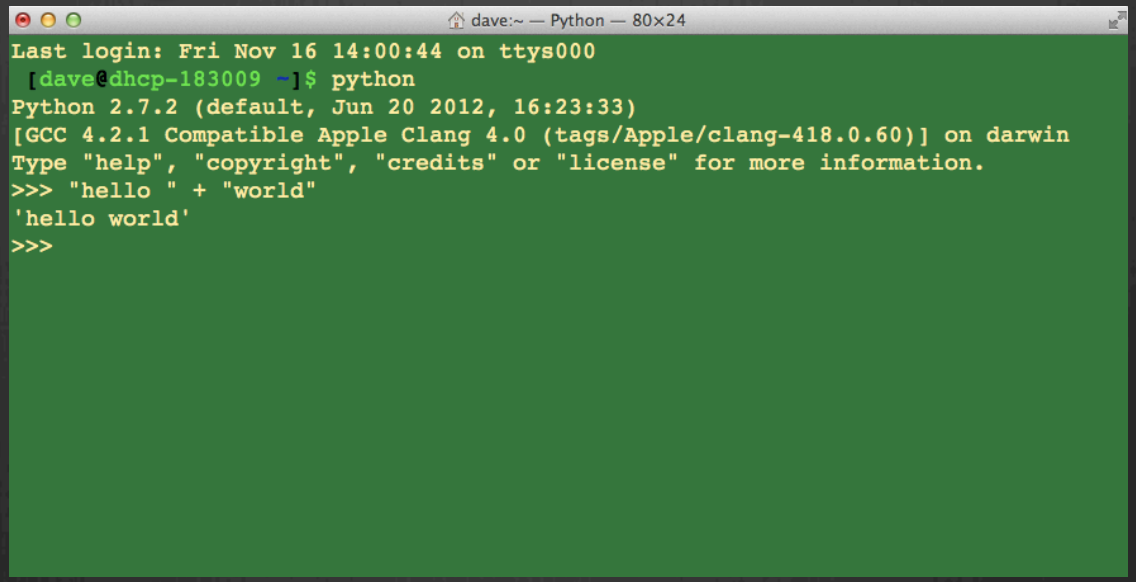
No hard and fast rule (in academia). Good and bad talks can be made with any technology.

Some tend to be more bad than good.

Live Demos

Need to be super well-prepared

Live coding:



Finishing

Absolutely, without fail,
finish on time

Finally…the Top Tips from the Pros









Finally…the Top Tips

Decide what ONE message you want your audience to leave with, and build the presentation around it

(so if you're presenting a paper, don't necessarily follow the outline of the paper)

Focus on

THE KEY TAKE AWAY

from the talk.

Finally…the Top Tips

If two of you are presenting, sit down while the other presenter speaks

Finally…the Top Tips

Cliffhanger style presentation:

At the end of each slide, the audience is left with a bit of intrigue resolved by the next slide.

Finally…the Top Tips

1.1 - don't put too much text on your slides

1.2 - practice your talk - if necessary before a mirror.

Finally…the Top Tips

Keep the overall argument high level
BUT

dive down to the one or two most interesting bits of the technical level, to show the nature of your work and to keep the intellect of the audience entertained.

Finally…the Top Tips

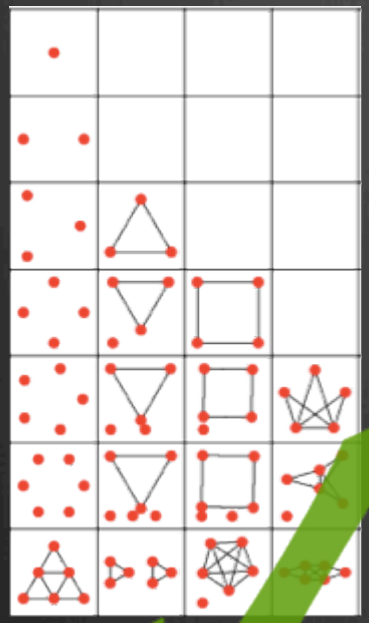
Examples first

always start by giving an example before you dive into the general (formal) explanation

Start with an example; delete the "outline" slide!

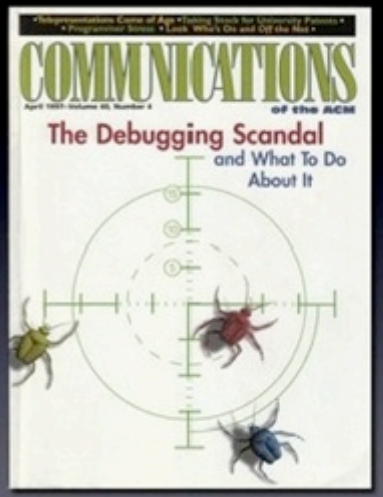
Finally…the Top Tips

Convey everything with pictures and code. Almost no words on slides

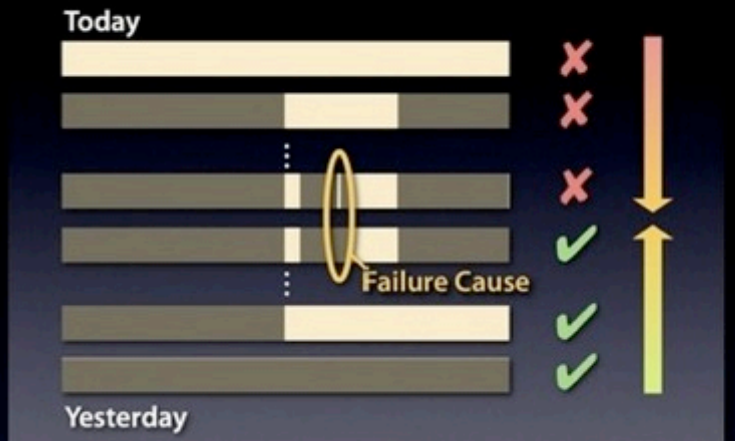


Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation

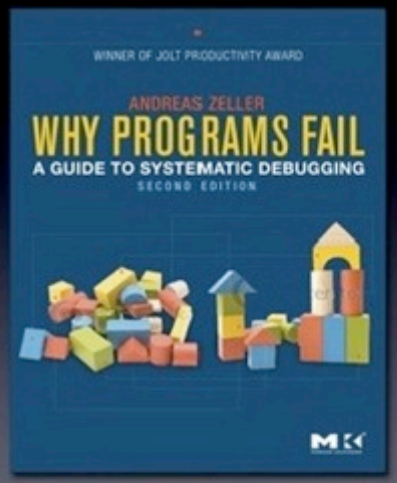

Thank you for listening!
Questions?
andreas-zeller.blogspot.com



Tracking Debugging



Simplifying Debugging



Automating Debugging

It's the process
that matters.

Fixing Debugging

Learn from the great talks that you attend: what made them great?

Pick up ideas for what to do and what to avoid

Outline of my talk

- Background
- The FLUGOL system
- Shortcomings of FLUGOL
- Overview of synthetic epimorphisms
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- Conclusions and further work

The purpose of your talk…

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