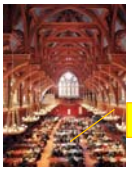
THOUGHTS ON GIVING PROFESSIONAL TALKS

Ken Birman

Dining philosophers

while(true) {

- Think



- Eat

}

Not enough forks!

Dining ~~philosophers~~ researchers

while(true) {

- Think

- Teach

- Eat

}

Not enough forks!

Topic of this talk

- How to prepare a professional seminar or presentation
- Dealing with timing and flow
- How detailed to get?
- Structuring your material
- Dynamics of talking to an audience
- Common pitfalls

Professional talks

- The centerpiece of any research career
  - As important in industry as it is here at Cornell
  - Key to getting a great job… and to keeping it!
- Anyone can learn to give good talks
  - But not everyone is born knowing how

One size *doesn't* fit all uses!

- Lecture in a course
- Short presentation at a conference or workshop of specialists in your field
- Short talk to a broader audience
- Long talk (50 minutes) to a general audience, for example a job interview
- … each presents a different set of challenges

Pithy advice from Ken's Dad

- Plan to convey one "idea" per 20 minutes
- Stay within the allocated time
- Engage your audience – make them *like* you! Think of it as a conversation with them.
- Each talk should "peak" with a central 10 minutes or so of hard, core material

Common mistakes

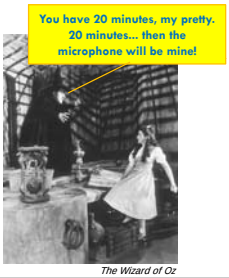
- Most speakers really wish they could present their hardest technical results. But most audiences aren't looking for that.
- If you go too fast at the beginning the audience won't understand why the problem matters!
- Going slow and carefully implies a limit of 10 out of every 20 minutes for the meat of your talk

… but don't omit that core

- The audience expects a core insight.
  - It's why they came to your talk
- Build up to it, then blow them away.
- Recap (and cite prior work) at the end.
- It's ok to lose them by getting too technical as long as you don't do it too often

Time… friend or enemy?

- Time is the hardest element to master
  - Many speakers lose track of time as they talk, this is disconcerting
- But if your talk runs over…
  - …then you die



The Wizard of Oz

Many talks start late!

- Usually time gets deducted from your "slot"!
- Most seminars start 5 minutes late and save 5 for questions. Introductions take time, too.
- Some circumstances cause a long delay. Ask if you should try and end early and, if so, do it
- When forced to trim back, think hard and make your choices deliberately

Sense of timing

- Know when you plan to stop.
- Find a wall clock… or put phone in timer mode
  - Check it often.
  - Adjust your pace on the fly

- Trusting a "time keeper" can be a mistake
  - *"Oops, I forgot to warn you. But your time's up just the same!"*

Structuring a talk

- Most talks have a "standard" structure
  - The introduction and "context setting" part
  - The more detailed problem statement
  - The solution to the problem and validation
  - Implications of your work
  - Wrap-up

Sample timelines

	# Slides?	Warmup	State model and Problem	Core Results	Prior work, recap/summary
20 minutes, specialists	20-25	2	5	5	5+3
20 minutes, general audience	18	5	5	5	3+2
50 minutes, specialists	50-65	5	10	25	5+3
50 minutes, general audience	45	10	20	10	5+3

- If you cover prior work "in flight" just shift 5 minutes to the appropriate section(s)…

Instead of an outline…

- Tell them what your innovation concerns.
  - *"Next we'll show that… this isn't obvious because… the exciting thing is that we can generalize the result…"*
  - Emphasize who will benefit from this work
  - Position your work in the area
  - Explain the importance of the result
- Remind them when you get to the result
  - *"Recall that we need to show that…."*
- Briefly say it again in the summary
  - Stress here is on ***briefly.*** A summary is ***short***

Overcoming fear

- Some situations are inherently frightening…
  - For example, the fate of your whole career is impacted by your interview talk
  - … or that first talk at SOSP/STOC/SIGMOD!
- So you need to get past that stage fright
  - Being well prepared helps a lot
  - Once you get started you'll feel much better

Overcoming fear

- Move around!
  - You won't look or feel so stiff
  - Feel free to gesture with your hands and arms
- Convey level of interest with tone of voice
  - Frightened speakers often drone in a monotone
  - This creates a negative feedback loop!

If in doubt…

- Lots of us have last minute doubts
  - …. *Just smile confidently, and do your job*
  - Describe but don't apologize for limitations of your work… nothing is perfect…
- Body language sends a message!
  - Audiences sense lack of confidence
  - If you don't believe in yourself, who will?
  - If you *do* believe in yourself, they will too!

Some common mistakes

- Getting too detailed.
  - A talk should convey the style and impact of your work but usually can't cover the real details!
- Losing their enthusiasm.
  - More important for the audience to feel excited about your work than to understand every single detail
  - Tell them *why your work is exciting to you*

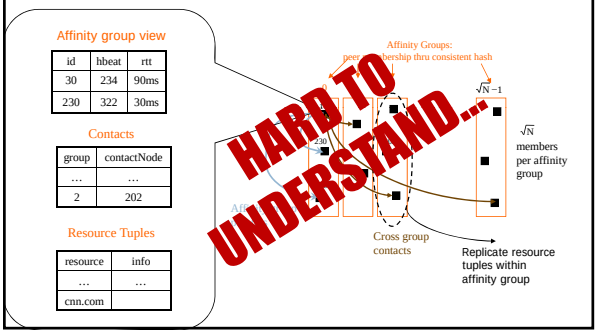
Pretty Bad Slides

Nobody gives good talks with bad slides

Generalized insight?

- Ideally, a slide should be
  - Simple… Self-explanatory
  - Should "build" on intuition
- But sometimes you have no choice:
  - Some slides just aren't simple

Kelips



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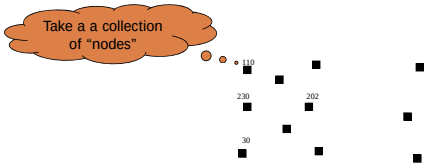

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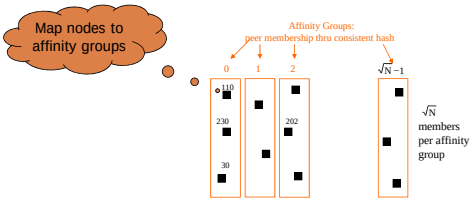

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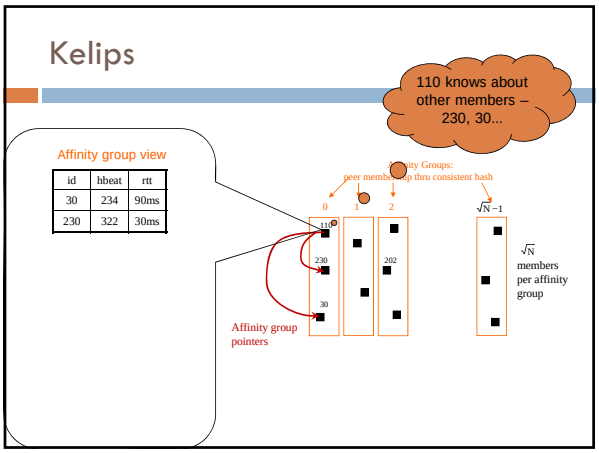

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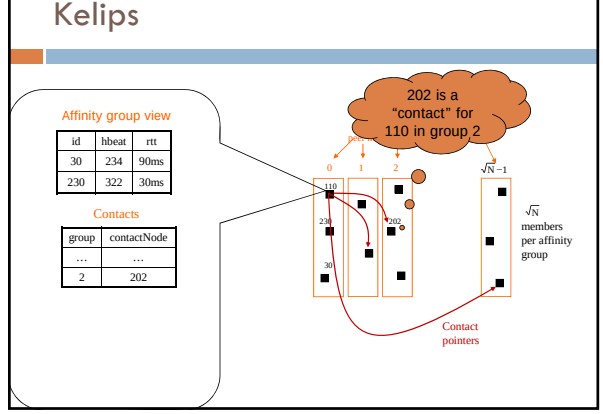

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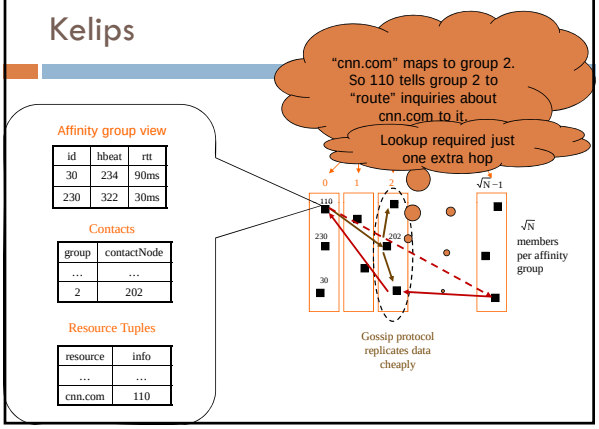
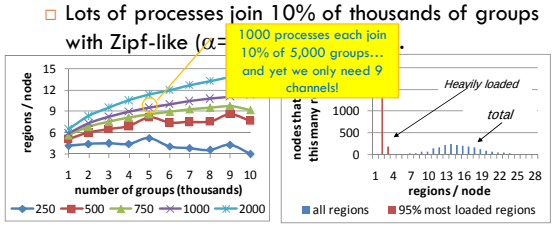


Why do builds work?

- Pop-ups eliminate need to point to slides
  - They "tell my story" for me
  - Step by step "build" carries audience along with your thought process
- Pictures really are worth a thousand words
  - But they need to be simple and clear
  - Pick dark, easily legible colors

A slide with graphs

- Lots of processes join 10% of thousands of groups with Zipf-like (α=



Nodes end up in very few regions (100:1 ratio…)

And even fewer "busy" regions (1000:1 ratio)!

Slides with tables

Kind of technology	Why we rejected it
IP multicast, pt-to-pt TCP	*Too many IPMC addrs. Too many TCP streams*
Software group multicast solutions ("heavyweight")	*Protocols designed for just one group at a time; overheads spar. Instability in large deployments*
Lightweight groups	*Undesired undesired traffic, data sent indirectly*
Publish-subscribe tools	*Unstable in large deployments, data sent indirectly*
Content-filtering event notification.	*Very expensive. Nodes see undesired traffic. High latency paths are common*
Peer-to-peer overlays	*Similar to content-filtering scenario*

DON'T READ THEM THE WHOLE TABLE!

Slides with tables?

Kind of technology	Why we rejected it
IP multicast, pt-to-pt TCP	*Too many IPMC addrs. Too many TCP streams*
Software gro… multicast sol… ("heavyweigh…	*…a …e*
Lightweight …	*…indirectly*
Publish-subscribe bus	***Unstable in large deployments, data sent indirectly***
Content-filtering event notification.	*Very expensive. Nodes see undesired traffic. High latency paths are common*
Peer-to-peer overlays	*Similar to content-filtering scenario*

Better: Just explain that "in this table we summarize the existing options, but none are very good. For example, publish-subscribe is quite unstable in large settings. I won't go through this line by line but the story is grim…

…avoiding common mistakes

- Graphs are hard to interpret.
  - Explaining a few data points helps.
- Stick with standard font sizes
  - **Slides with tiny, dense text are illegible.**
  - **You thought you squeezed more on the slide, but you might as well throw away that slide!**
- Bizarre/complex pictures, special effects.
  - Audience will be baffled.

And that's it!

- We've covered the really big stuff
- Let's spend a few minutes on tricks that can help you keep your cool and deal with unexpected problems

Sizing up the audience

- Try and find out in advance. But then assume a slightly "more general" group
- Assume that the room is full of very smart people. But also assume that they lack background on your topic
- Your job is to convince them that the topic is interesting and important and that they should read the paper. "Advertising"

Before they introduce you

- Deal with the laptop hookup ahead of time.
  - Or while the guy before you is taking questions
- Pre-test *all* your slides if isn't your machine.
  - Mac, Linux / PC incompatibilities are famous!
  - PDF works best (but builds will be lost).
  - You can always just say "No, that won't work for me"
- Put on the microphone as soon as you can.

Technology catastrophes

- Stay calm but take control. *Resolve the issue.*
  - Time wasted will come from your slot
- Serious glitch?
  - *"Look, let's skip to the next speaker to give me time to work out this laptop issue"*
  - Don't think, just do it.
- Then find a laptop that works!

Introductions

- It's their job to introduce you.
  - Find out who and provide a little background
- If they botch the introduction, smile!
  - Then start with a single sentence of self-introduction.
- Don't spend an hour listing co-authors.
  - Just point to the slide and say "I'm Frank, and I'm representing the Cornell research team today".

Engage your audience

- Relax. Look at the audience. Enjoy yourself. Take your time (but not too much time)
- Keep it light
  - But don't use comics, self-deprecating remarks or comments about people being sleepy.
  - (More on this later)
- Look at the room when you speak, not the slide. Watch to see if they are following you.
- Pause often. Look around.

Creating a friendly audience

- Personalize your talk
  - Mention attendees by name now and then
    - *"This next step may remind you of Fred's classic paper on state machine replication"*
  - Using people as proxies makes algorithms friendly.
    - *"So, Fred sends a note to Sally asking the time… She checks her watch and responds."*

More on… time problems

- Don't hit every detail on every slide
  - In fact, good speakers look at the slide but then "ignore it" and just speak to audience
- Skip ahead if you fall behind.
  - Skipping slides is common. Decide in advance which ones *really* matter
  - Don't bring 60 slides for a 10 minute talk…

Use jokes cautiously

- Getting people to laugh *with you* is good
  - But your job isn't to be a comedian
  - Don't tell "real" jokes, but look for opportunities to lighten the presentation now and then.
- Encouraging them to laugh *at you* is always bad
  - *"I can see that I'm putting you to sleep"*
  - *"I know this is going to be boring"*

Powerpoint effects

- Limit your use of special effects
  - They get old kind of fast
- And don't copy comics onto your slides
  - People will have trouble making them out
  - Written jokes are hard to use in talks

Avoid lists

- Lists are very boring.
- If you do have a list, don't read it
  - *"Our work has applications in many areas. I've listed a few here. We're especially motivated by medical applications."*
- This is a very hard lesson for speakers to learn!

Theoretical results

- Show them a key theorem or two
  - Explain how your proof works
  - Then state other theorems (without proofs)
- Remember: even brilliant people can get lost
  - Focus. What do you want them to learn?
  - Teach the key points and get them *excited*.

Some common problems

- Bored looking audience
  - Perhaps you are getting too detailed.
  - Perhaps you are going too fast.
  - Perhaps you aren't connecting.
- Don't make self-deprecating remarks!
  - Instead, engage someone directly
  - *Fred, you asked how we handle race conditions. Let's tackle that. Now, what is a race condition?*

More common problems

- Audience is making you uncomfortable
  - Instead of looking at individuals, look at gaps between them, or the air over them (but not at your slides!)
  - Speak in 1 minute "chunks", look at audience during pauses and focus on what you are saying
  - Slow down even if you need to skip details. Hit the important points and remind them why this matters and how it relates to the big picture

More common problems

- Question throws your timing or sequence off
  - Answer questions very briefly. It helps to restate the question in your own words (especially if the question was bizarre)
  - Answer in a sentence or two, not a speech
    - If you will cover a topic soon, say so: *"We'll get to that in a moment."*
    - When you get there, point it out.

You ran out of time…

- Despite my advice, it happens!
  - When the moderator says "time's up", smile, shrug and thank him.
  - *"Thanks, Sam. I'll jump to my last slide"*

You ran out of time…

- Use at most 30 seconds to summarize
  - Don't try to finish your talk
    - *"In summary, we have an improved factoring algorithm for large composite integers, suggesting that RSA encryption may not be as secure as was believed.*

      *I'm sorr*y *I wasn't able to present the entire proof.*

      I hope Ron will allow one or two short questions."

Cutting off questions

- The question session should be reasonably short. After five minutes
  - *"I suspect that we're out of time. Ron, do we have time for one last short question?"*
- If you sense that some people want to stay and some want to leave, control the situation:
  - *"I know many of you need to leave. We apparently have the room for another 20 minutes, but feel free to go. I'll stay as long as anyone wants to continue to talk about the subject! Again, thank you very much."*

Cutting off questions

- Always answer questions *briefly*
  - Great question? Say so.
  - Confusing question? Restate it.
- Questioner gives an angry speech…
  - Don't take the bait: stay controlled and confident.
    - *"Thank you, David. Let's discuss this further offline."*
    - *"OK, let's get back to very large sparse matrices…"*

Language challenges

- Avoid "unusual" vocabulary
- Consider writing out the talk ahead of time
  - Practice until you are very comfortable
  - Do a dry run with a *native speaker*
- Pace your delivery, don't rush!
- Pause after key points

Special: Interview talks

- Point out which parts of your work were joint
- But stress your personal contribution
  - Everyone knows you collaborated with your advisor; that doesn't count!
- At the end, in the summary, run through a quick list of what you contributed
  - But avoid dry lists of results. Convey excitement!
  - Just a sentence or two, not a whole extra talk

What to take away?

- Motivate your talk – put it in context
- Go slowly even if you must omit detail
  - Force yourself to slow down!
- Include that hard technical core
  - But advertise the work, don't try to present every little detail of it. Make them want to rush off and read your paper!
- Adapt as you go.

What to take away?

- Know your audience.
  - Engage them. Decide what you want to teach them. Explain results in their terms
  - Talk about your work using "unusual" terminology if this will make it easier for them to understand
- The audience came to learn something
  - Just in case… Tell them what they learned!

What to take away?

- Think really hard about slide design
  - Use color, callouts, builds
  - Don't let slides get crowded
  - Build up over several slides. Reusing knowledge is an incredibly useful technique
- Do show your best results.
  - And explain them… but don't try and cover every lovely detail!

One final thought…

Practice really does make perfect!