Giving an Academic Talk

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These are my opinions on how to give a talk (using presentation software or transparencies) in computer science or mathematics, distilled for my students and for students attending Graphics Lunch. I go to conferences, see the same mistakes repeated by many a speaker, and write my reactions here. You are welcome to disagree with my opinions, as long as you think each issue through for yourself.

Preparing the talk

Your slides. The plain absurdity of modern academic talks would be glaring if we hadn't all pickled in it for so long. Recall the last one you attended. The speaker flashed a slide full of words on the screen and talked. Did you read and understand the slide? Did you hear every word spoken? No, you had to make a decision about what to miss.

Recall the last talk you gave. I bet you made the same mistake. Ask yourself: why are you projecting a slide that virtually guarantees that your audience will stop listening to you? If you expect them to listen, why are you showing slides that they won't have time to read? Like circumcision or Christmas fruitcake, we do it out of tradition, not because it isn't nasty.

If you want to be a great speaker, you must first accept the fact that a slide with more than twelve words on it is usually counterproductive. Next, accept that this means you will have to prepare harder than the 99% of your colleagues who are still babbling to fill the time while the audience puzzles over their slides.

How do you stamp out those excess words? First, your new *modus operandi* is to express all your ideas in pictures. Resort to text only where illustrations fail you. As an exercise, try to make a talk where the *only* text is the slide titles, and perhaps a few two-word labels on figures. Even if you don't quite succeed (I never do), you'll learn a lot about presentation by trying.

Second, examine your unconscious belief that the purpose of slides is to remind you what to say. Once upon a time, speakers prepared index cards. Today, speakers project their index cards (as a list of bullet points) and make their audiences read them. Please understand that this is a hostile act. Go back to index cards. Some presentation programs let you write notes that appear only on your laptop screen.

As an exercise, imagine this scenario. You are projecting a slide that has *nothing but a title*, say "Advantages of Matrix Projection." You have in your hand (or on your laptop screen, but not on the big screen) a list reminding you of all the points you want to make. You simply talk to your audience, just like Abraham Lincoln delivering the *Gettysburg Address*. Can you see how much better this is than bullet points? Now imagine if you had an apt illustration for each item on your list, and simply showed them (under the same title) one by one as you spoke.

In summary, *minimize words and maximize pictures. Your slides are not there to remind you what to say. Bullet points make your audience feel your talk is in bullet time*. Here are a few other tips.

- Most talks I attend use fonts that are too small. Your academic colleagues are all nearsighted. I use 38 point text and 42–50 point titles. As wise speakers rarely put more than twelve words on a slide, there's plenty of room.

- Projected slides, unlike printed documents, do not need margins. Yet most speakers put wide bands of empty space on the border of every slide. I feel that they are taunting the audience: “I could have used a readable font and big pictures, but I decided to do extra work to make them illegible.”
- Use only sans-serif fonts. They're easier to see from the back of the room. (Exception: math fonts usually have serifs.)
- Simplicity is the best aesthetic. Your audience has very little time to absorb what's on your slide, especially with you nattering on all the time. Some people put accretions like project logos, the talk title, and the conference name on every page. Don't.
- For slides with formulae, one of my favorite tricks is to add arrows and labels pointing to the variables in a formula, reminding the audience what each one means. Few people will remember nomenclature that you defined on a previous slide.
- A talk of 30 minutes or more needs to be broken into sections, with a title slide or an outline slide demarcating each new section. (For shorter talks, use your judgment. Outline slides and the accompanying speeches are boring, so keep both short.) The goal of the title slides is to alert your audience to transitions and changes of subject, and to tell it in advance what all the individual slides in the section will add up to. (A problem description? An algorithm? A proof? An empirical demonstration of your idea's wonderfulness? An evisceration of all previous work on the topic?)

Your organization. The most common mistake is to spend too much time on technical details, and too little time setting the context. A talk of 30 minutes or less should be an advertisement for the paper, not a replacement. Your goal is to convince your listeners that they must read your paper. This is a very ambitious goal. Focus on the **big picture** issues.

- **Why** is the problem you are solving worth solving?
- What is the **core difference** between your method and all those that came before? This is really a two-part question (which most speakers screw up by answering only the second part).
    - What does your method **accomplish** that no previous method accomplishes?
    - What algorithmic or methodological idea enables your method to accomplish more?
- What is the **evidence** that your method is better in some circumstances? (And what are those circumstances?)
- What is the **one big idea** that you want people to leave your talk with? If you try to get across five ideas, you will usually impart none. If you choose one main idea and focus on advertising it, you will usually succeed. “Give them something to take home.”

These big picture ideas should also be foremost in your mind when you write a paper. They are so important, I'm not going to say anything more about organization. Put these issues first when you put your talk together, and you'll already be one of the best speakers at the conference.

I will let someone *else* say something about organization, though. I like the following quote from Herman Haverkort's defunct blog enough to excerpt it here.

We got explained two models of giving a talk: the clew model and the onion model.

The clew is a logical, linear argument building up to a conclusion at the end of the talk, like a clew unwinding until you finally come to the core. Miss one step in the talk and you lose the plot and miss the point. And yes indeed, this is exactly what happens when I listen to most conference talks and some lectures. In a three days' conference, I actually follow the first five minutes of one or two dozen talks. That is more or less it. After those five minutes, I get lost. I miss a “slide”

because I am still thinking about the previous one, get distracted by some random personal associations I had with something the speaker said, or simply doze off because the speaker has a tiring accent.

The onion talk starts with the main message, and adds depth in successive layers around it, always returning to the main message between layers. Since the main message and the main ideas are repeated often, a listener can still follow most of the talk even after dozing off for a minute. Also the talk does not get screwed up near the end when the speaker is running out of time, because by then, the most important things have been said already and the speaker has no reason to hurry.

The final pass. When your slides are done, go through them and examine each slide's title carefully. Do the titles emphasize the right things? I bet you can improve at least half of them. The job of each title is to set the context and tell listeners what your words are trying to accomplish. When audience members wake up mid-talk and try to pay attention again, the first thing they'll do is look at your current slide's title. Make sure it tells them why you're babbling on about grommets right now.

Giving the talk

Practice. It's obvious, but lots of people still don't do it. Give a practice talk (even if you're alone) before you give a public one. Better yet, give three.

Pointers. I really, truly despise laser pointers, but this is because most people use them badly. Astonishingly badly. Buy an old-fashioned telescoping pointer—they're much easier to follow with the eye. They also force you to move around. Speakers with laser pointers tend to roost in one spot, like barnacles excreting glue, for their entire talk. Because a telescoping pointer forces you to gesture and walk, your voice will become more dynamic as well.

Of course, there are some venues where the screen is too big for a physical pointer. Rule: if you must use a laser pointer, when you point at something, **hold the pointer steady**. Most people try to circle an object instead of pointing at it. Guess what? Nobody has a clue what you're pointing at! I have sat in conferences and watched one speaker after another after another do this, all oblivious to the fact that their audience has no idea what they're indicating. If you just saw the screen and not the speakers, you'd think the speakers were breakdancing.

(Little-known literary fun fact: according to Dante, the third circle of Hell is the home of those who use the mouse and cursor to point at things.)

Laptops. Before the session, remember to turn off your laptop's screen saver. As well as any application that might try to download the latest version of RealPlayer mid-talk. (This is not a hypothetical occurrence.)

Another way speakers make themselves look goofy is by staring at their laptops' screens while speaking. It's human nature for your audience to follow your eyes, so use human nature to your advantage. When you look at the projection screen, the audience's eyes will follow yours and their attention will be where you want it. When you look at the audience, they will listen to what you say. When you look at your laptop screen, your audience will be distracted; they'll neither hear what you're saying nor see what you want them to look at. Try to place your laptop screen where *you* can't see it.

Opening. Begin a talk by introducing yourself by name, even if you've just been introduced—unless you've received an unusually long and clear introduction. The session chairs who introduce people at conferences often garble the names or fail to use the microphone. People are finishing off conversations while the chair introduces you. The people in the back of the room probably didn't hear the introduction, even if it sounded clear to you.

If the talk is important enough (e.g. a job talk), have your spiel memorized for the first few slides, so you get a smooth start no matter how flustered and tired you are. (Of course, never memorize a whole talk, as you'd sound terribly stilted.)

Nonverbal communication. An infamous study by Nalini Ambady and Robert Rosenthal, "Half a Minute: Predicting Teacher Evaluations From Thin Slices of Nonverbal Behavior and Physical Attractiveness," shows that students can predict a teacher's ratings with significant accuracy after watching a 30-second *silent* video clip of the teacher at work. Resist the urge to attribute this to the superficiality of students' ratings. What is the nonverbal magic that an audience recognizes so quickly?

I believe they are seeing communication uncluttered by extraneous motion, facial expressions, fidgeting, utterances, and other nonverbal behaviors so subtle that the speaker is entirely unaware of doing them. A faint, transient facial expression or a brief unconscious twitch of the arm are enough to rob a speaker's words of their force, and even break an audience's attention. But how can you fix this?

Your mental focus. I believe that the secret is in where you habitually place your attention. When you speak, most of your attention is on what you are saying. But if you've rehearsed decently, you'll have some mental room left over, and other thoughts will fill the vacuum. If you could listen to a speaker's thoughts, you might hear "Am I going too fast?" or "Are they understanding this?" or "How do I look?" or worse yet, "I wonder if they like me." Any thought regarding whether the audience approves of you or not is the *worst* place to put your mental focus. It's like beseeching God to make you a loser.

One of the biggest epiphanies of my life is a fact that probably seems counterintuitive to most people who think for a living: *if you're already thinking of what to say next while somebody is still speaking to you, you will appear socially inept and they won't like you.* When you're the one speaking, there's a similar principle: *if you're in your head, you will look awkward and speak awkwardly.*

Great speakers—like great leaders—habitually focus on the right things, which means almost anything outside their own egos. Perhaps the best place to focus your attention is on *the sensations in your own body*: How do my legs feel? Will I feel more relaxed if I breathe just a little deeper? Am I *enjoying* the rhythm of my voice as I speak? (Ideally, these aren't *verbal* thoughts; they're *felt* perceptions.) The next best place is on the sensations in the bodies of your audience. Of course, you can't know for sure what they feel, but you can empathize and try to guess. Don't do it in a "Do they like me?" way; your attention should be on *their* welfare. Try to open your body to *physical pleasure and connection*.

This focus on physical sensation has several benefits. It clarifies your communication: fidgeting and misleading gestures attenuate; your voice and rhythm improve; and you slow down your motions and speech. Your focus on your body gives you more presence in the eyes of the audience, and you marshall energy toward projecting your message with congruent body language. Your focus on the sensations of your audience makes them feel connected to you. This

sensate focus awakens your limbic system, while leaving your cerebral cortex free to do the talking.

If you're not a natural, it takes discipline to change your habits and permanently refocus your attention. Academics, especially mathematicians, are not known for being in their bodies. Let it be something you practice not just when you give a formal talk, but during your day-to-day socializing. Learning to habitually place your attention outside your ego and on your body sensations and the people around you will not only make you a better speaker; it will improve your relationships with everyone.

Speaking. Good speaking has rhythm. Ever hear an entire talk delivered in a uniform, unchanging cadence, as if the whole speech was one long paragraph? I've heard lots of those. Choose key points in your talk where you wish to bestow extra emphasis. (If you followed my advice on preparation, you know what these points are.) Then decide how you will emphasize them. Sometimes I do this by speaking with a particularly slow and deliberate voice. Sometimes I say outright, “Here's the most important idea in this talk.”

Silence can be articulate. Leave a long pause right after making a key point. Let it sink in.

There are two mental adjustments that will help you speak fluidly. The first is a mental focus on body sensations, discussed above. The second is to give yourself permission to take as long as you like to think of what to say next. This is easy to say, but hardly anybody internalizes this attitude. Do you ever find yourself saying “Uhhhhh”? If so, you don't really believe you have permission. Some part of you is afraid of losing your audience if you don't fill the silence.

Tell yourself that there's no hurry, no need to fill empty spaces with sound, and certainly no need to get to the end of your slides. (Structure your talk so this is true!) The audience is too busy trying to understand your slide to care how long it takes you to think of the next sentence. Trust yourself. Think patiently. The right words come faster if you don't force them. Demand your right to remain silent.

Never meta-comment on your speaking. How often have you heard a speaker say, “I guess I'm running out of time; I'll just go through this quickly”? Did you hear a single word he said after that? Silently decide what to do; don't burden your audience with it.

Closing. Always end your talk by saying “Thank you.” It is not pretentious—you are doing the audience a favor. If you do not cue the audience so they know when to applaud, they will be confused and irritated. Like most social rituals, the thanks-applause sequence comforts everyone. Do not ask for questions until you complete it.

That's all! Most everything else, especially aesthetics, is learned through practice and feedback. I could go on, but by trying to teach more I'd teach less. Same goes for you.