How To Give a good Technical Talk

Bertrand Meyer
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Chair of Software Engineering
Welcome to my talk!
The Plan Of My Talk

- Part 1: What I am going to say
- Part 2: The problem
- Part 3: Initial approach
- Part 4: The basic idea
- Part 5: Refinements on the basic idea
- Part 6: Some useful observations
- Part 7: Summary and conclusions

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Introduction

In this talk I am going to discuss how to give a good technical presentation. I will go over different techniques and tools and try to share as much of my experience as I can. You should not expect a perfect recipe for success but I hope that I can help you achieve enough proficiency to become an effective technical speaker able to carry his or her results to a broad technical audience and maybe even to the point of starting to enjoy giving such talks, while the audience is benefiting greatly from your insights. I will talk about many different aspects of giving talks, including some having to do with substance and some with form. For example I will describe the best way to organize and present your slides and some of the common mistakes that people make when presenting their talks, and which can ruin the presentation of even the best ideas. That’s really a pity because it is not so hard to become good at technical talks as long as you have the substance to support your presentation techniques. In fact that is the first thing I will start to talk about: that what matters most is content. But even with the best content it is essential that the presentation techniques be good enough to support the concepts. Too many excellent research efforts have been damaged by lousy slides, lousy delivery, or the violation of elementary rules of public discourse that every 14-year old should master but that, for some reason, even seasoned presenters, not to mention professors, continue to ignore. I hope you won’t be one of them and intend to give you a kind of laundry list of techniques, dare I call them tricks, that won’t necessarily make you a Broadway actor but should at the very least enable you to deliver the results of your research clearly, forcefully and effectively.
OK, let’s try again, seriously this time!
Technically Speaking!

Bertrand Meyer
ETH Zürich
About this course

Goal is to give you an idea of:

- Scientific research
- The state of research in software engineering today
- The methods and tricks of technical presentation

This is an active course: you do most of the work!
Teaching staff

Bertrand Meyer
Carlo Furia
Sebastian Nanz
Martin Nordio
Michela Pedroni
How the course works

Today: intro to technical talks

This week: you pick a paper to present (see course page)

Starting two weeks from now (there’s nothing next week):

- You must be present (attendance sheet, circulated at 8:15)
  - You must attend at least 10 sessions. Contact us in case of illness or military service

- You will have to present a paper in one of the sessions
Your presentation

Presentation time: 20 minutes. Includes any clarification questions (give short answers). This is the standard conference presentation time.

Tolerance: another 5 minutes. After that we will cut you off.

Discussion: up to 15 minutes.

When others are presenting: do ask questions in the discussion session. Look at their papers in advance.
How to choose a paper

We give you a large selection from recent research (past five years)

Conflicts resolved first-come, first-served

In choosing a paper, weigh several criteria:

- **Difficulty of paper**
  - A harder paper is to your credit, but only if you cover it well

- **Your interest in the topic**
  - But you should also discover something new
How to review the paper

Understand the paper
Present its key points clearly
Do not parrot the paper: explain in your own words, for this audience
Try to devise your own examples
Read principal elements of referenced literature
The easier the paper, the deeper your work should be
If a tool is available for download, try it
If empirical paper: redo some experiments
If theoretical paper: redo the proofs
Do not hesitate to assess the paper and give your own opinions, but separate “news” from “editorial”

Prepare your presentation like a technical talk
How we grade

No set formula, but we take into account the following:

Content (about 60%):
- Your understanding of the paper
- Your mastery of the topic as a whole
- Depth of presentation, i.e. how much further you went beyond just reciting the text: new examples, tool usage, experiments, proofs...
- Scientific rigor
- Handling of questions

Form (about 40%):
- Quality of slides
- Quality of verbal presentation
To prepare

Start early
Get help from assistants
(Talking to other students about the papers is also permitted, and encouraged)

Show your slides to others

Rehearse the presentation
Technically Speaking!

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ETH Zürich
The bad news

The key rule to giving an outstanding technical talk...

... is something I can’t even begin to teach you in this presentation:

...Content!

Form follows function
More bad news!

As to the rest...

not everyone has it by birth!

(or prior education)
The good news

You can learn.

Anyone can become a good technical speaker!
Talking about substance...

Integrity is essential

No need to be shy about your results, but don’t over-represent:

➢ Never assert for a fact what you don’t know to be one. (Conjectures, working hypotheses etc. OK if labeled as such)
➢ Never make a statement that you wouldn’t be able to defend if questioned
➢ Do not use time limits as an excuse for dubious assertions

Do mention limitations, uncertainties and doubts on your results; this is the mark of the professional

Do not imply that you came up with an idea if it is from someone else; give credit.

➢ (But do not spend time acknowledging co-workers etc., this is for the paper. A single slide at the beginning or end is OK.)
Your key resource and enemy...

... is time.

You won’t be able to say all you would like to.

- The question is not whether to skip some of the material
- The question is what to skip
Things to do in advance

Answer the following questions (assuming your talk is scheduled for 30 minutes):

- What are the three key ideas or results I want to convey?
- If I have only 20 minutes, what will I cut?
- If I had only 5 minutes, what would I select?

Cut down on the number of slides; shorten remaining ones (Keep some of the extra material handy, for example after the conclusion)
A standard way to structure your talk

- Start with a clear statement of the problem
- State your essential contribution at the beginning
- Then develop it
- Keep a surprise for the final part
- Conclude with a summary of results and openings for the future
Presenting: the basics

Speak to your audience, not to your slides
Face the audience, make eye contact:

- Include *all* listeners
- Stay with one person for one line of thought
- Change to next person if you receive an acknowledgement (e.g. nodding)

Control your movements, no funny or distracting gestures
*(Gestures should serve the content)*

Form follows substance!
The really basic basics

You want* to be understood!

- Structure your presentation
- Keep sentences short
- Talk loudly enough
- Vary your voice

Use pauses for effect

* (We hope)
The basics of the really basic basics

You are telling a story!

What characterizes a good story?
Of course, this is not just any story

The technical talk is a genre in itself
Knowing your audience

Relate to your audience

Do a little research on your audience ahead of time (but be prepared to adapt)

Know to walk the fine line between a little flattery and pandering
Managing time

Determine a time per slide (e.g. two minutes)

Cut, cut, cut!

Get rid of anything that’s not essential. Get rid of platitudes. Get rid of irrelevant comments.

Don’t hesitate to repeat the most important or novel statements. People don’t listen 100%.

Don’t repeat the outline, as most people do - this is the best way to lose the interest of your audience
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Managing time

Plan your talk shorter than required

- 2 minutes per slide
- Include time for questions, discussion

Skipping slides looks unprofessional
  (but you may keep extra slides for expected questions)

Using too much time is rude
If you have stage fright...

You are neither the first nor the last.

There's nothing wrong with you! (Unless you do nothing about it)

Just think, learn and practice

You’ll learn to turn your stage fright into an advantage
The audience...

... is mostly on your side.

Make them your allies

Be prepared for the worst, and then assume the best

How to deal with hecklers and troublemakers:

- Politely but firmly
- Always remain one level above them
- Use the rest of the audience to help you
Involve the audience if you can

Ask a question

Not just a show of hands

Be prepared to handle the answer

But: be careful about the effect on time
Humor

One of your most potent weapons, but:

- An “opening joke” is almost always a bad idea
- Any humor should be related to the content
- Verdi vs Wagner
- If you don’t have a natural sense of humor, don’t force yourself — It will show
- Be careful of cultural differences
- Try not to insult all of your audience all of the time
How not to start

- “I am really happy to be here”
- “Thanks for coming to my presentation”
- “You won’t believe what Lufthansa did to my luggage!”
- “Buenas dias!” (unless you can continue in that vein…)
- “My advisor told me to give the talk for him, but I am not really prepared”
- “I only played a small role in this research, but all the others had exhausted their travel budget for this year, so here I am!”
- “I am not sure why the program committee accepted our paper, but here I am!”
- “As part of milestone 13.9 of the European Project 491162-B our group must to present three papers at middle-quality conferences (D-4 or below). This is number 3.”
Introduction

Key part of the talk:

- Catches (or lose) audience
- Arouses interest and curiosity
- Audiences’ attention and concentration only get less

![Audience attention graph](image)
How to start

(See: Mozart and Beethoven)
The
Mathematics
of
Object
Computation
Bertrand Meyer

Preliminary material for LASER school,
Elba, September 2004
Imagine…

... a world without cartesian product!
How not to end

▪ “Thank you”

▪ “Thank you for your attention”

▪ “I am now finished”

▪ “This was my conclusion”

▪ “I don’t have any more time”

Here too, Beethoven got it right!
How to end

In applause
Slides

Key part of your talk

Diagrams and pictures should be clear & simple

Beware of acronym soup; always expand acronyms the first time around

For an important talk, slide preparation takes a long time; several hours for one slide is not an anomaly.

xxx: T
Designing your slides

Use small number of (reasonable) fonts and colors

I strongly suggest **dark on white** for a technical CS talk: conveys clarity and simplicity.

Reserve **light on dark** for marketing presentations.

Any font or color change should support meaning

**Forms follows function!**
Agenda for today

- Introduction
- **Quality issues**
- Lifecycle
- Modularity
- Reusability
- Abstract data types
Font size and color

Size: 18 to 24 points (28 to 32 for titles, down to 16 for program text if you have to)

If you don’t know the room, don’t use bottom 1/3rd of screen

**Never** go below 16 with one exception: OK to have small picture repeating a big picture of an earlier slide.

Watch your colors!

- Not all colors that look nice on your screen look nice with a projector
Welcome to my talk!
More on slide design

Every slide should carry one central idea

That idea may be divided into at most a few points

Abbreviate: a slide is not an article, but text should still be understandable

- The talk must say more than the slides

- The slides may say a little more than the talk, to add some auxiliary
  - But usually not in teaching
Even more on slide design

Keep extraneous information to a minimum:

- Beyond the first page: affiliation, institution’s logo etc. (are you recruiting?)
- Pictures, decorations unrelated to your content
- Dates, page numbers, ...

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Taking advantage of technology

Don’t succumb to “PowerPoint Paranoia”, but

- Use pictures
- Use effects (moderately)
- Use animations

Remember:

Form follows function
From “good enough” to good?

Beyond “good enough”, quality is economically bad
He who perfects, dies

Choose to release?
Event-driven programming
Some useful tools

Remote control

Laser pointer (or better the good old stick)

Tablet PC

Do not point with your hand or finger
A secret of the masters

Make the slides and the speech:

- Not redundant
- Not contradictory
- Complementary!
Practical tricks

Check the room in advance

Charge the battery, plug in your laptop (make sure you have the right adapters!)

Always carry a USB stick with your slides

Always have a secret URL at home with your slides *(in addition to the above)*

Things *will* go wrong!
Demos

Prepare 5 times as much as for the rest

Use your own laptop
   If you can’t, always practice on the target machine
   (otherwise, do not demo)

Prepare a script; write it down if necessary. Stick to the
script; don’t try anything during the demo.

A demo that crashes or malfunctions kills the talk
Another secret of the masters...

Practice, practice, practice!

- Go through dry runs within your group
- Use your friends as guinea pigs
- Film yourself and force yourself to watch the movie
- Watch other presenters and learn from them, both the good and the bad
- Take advantage of resources, esp. Didaktikzentrum
- Get everything right. It’s worth it.
Body language

Know your tics and get rid of them

Use gestures sparingly and to good effect

Form follows function
Effective speech

Listen to yourself, or watch a video

Know your tics, get rid of them (swinging, scratching, moving your limbs...)

Get rid of the “Uh”. Most people initially have them; they are the mark of the amateur. Also, they aggravate a foreign accent!

Other symptoms: repeating words, interjecting “you know!”, “so”, “then”, “basically”...

Be aware of these and eradicate them!
Clichés to avoid ABSOLUTELY

Last but not least

Each and every

“Without further ado...”
I am a PhD student since 6 months

I have been a PhD student for 6 months

Last not least

Last but not least

This runs quick, that went good

This runs quickly, that went well
Pronounce these:

Undermine

Determine

Expertise

Realize

Parameter

Transaction

Independent

Variable

Finite

Infinite

Integer

Ghoti
Complete:

What is the criteri... 

There are a number of criteri...
The bottom line

If you made it to this stage, you have what it takes to give an excellent speech.

You’ve done the smartest part: the content. Now you have to do the groundwork.

With confidence and dedication, and reliance on your own intelligence and resources,

form **will** follow function.