ACADEMIC SKILLS IN COMPUTER SCIENCE

Lecture 11: Oral Presentations

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Speaking well

Oral presentations:
- are common in research, industry and private life,
- will remain important throughout your career,
- can have a big impact on your personal success,

and yet they are often of very poor quality!

Goals for today:
- Appreciate the importance of oral presentations
- Adopt a structured approach for preparing your talks
- Get to know some general techniques and tricks for speaking well

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Why do you need to talk?

There are many occasions for oral presentations:
- Research talk
- Defence, job interview, . . .
- Invited keynote, TED talk, . . .
- Lectures, training workshops, tutorials
- Product presentation, project defence, sales talk, . . .
- Dinner speech, laudation, . . .
- . . .

Focus of this lecture:
Research talks and defences, but many remarks apply to all cases!

What do you want to achieve?

Main goals of oral presentations:

(1) **Inform:** teach the audience something new
(2) **Impress:** commend yourself as a skilful/competent/likeable person
(3) **Persuade:** convince the audience of an idea or product
(4) **Entertain:** make the audience have a good time
(5) **Learn:** get feedback from audience

Many talks pursue several goals, but with different priority

Examples:
- Lecture: inform, entertain (to sustain attention over long talk)
- Defence: impress, persuade, inform, entertain
- Research talk: inform (+all other goals at individual weights)
- Dinner speech: entertain, inform
- Political speech: persuade, impress

"Presentation" vs. "speech"

We can distinguish two extreme forms of talks, which can be characterised as follows:

"Presentation:"

- Spoken comment to displayed material (slides)
- Heavy focus on factual material and details
- Examples: this lecture, most talks in science and engineering, product and project presentations, . . .

"Speech:"

- Spoken delivery of a "story", often with little or no media support
- Focus on general ideas or particular (human) perspectives
- Examples: some keynotes, TED talks, honorific speeches, political speeches, research talks in the humanities, . . .

Many talks have some elements of both, but
computer scientists would often do well to add more "speech" to their "presentations"!

Preparing your presentation

How to prepare your presentation

Most presentations can be prepared in the following main phases:

(1) **Analyse the task**
(2) **Plan story**
(3) **Prepare slides**
(4) **Prepare words**
(5) **Practice**
(6) **Retrospective analysis**

This sequence is not a one-way street: it is often necessary to return to a previous phase if something does not work as planned.

Analysis

Q1: What are your goals?

- See earlier slide (inform, impress, . . .)

Q2: Who is your audience?

- Which part of the audience do you speak to?
  (Everybody? Experts? Your defence committee?)
- Background knowledge? Did they see other related talks before?
- Why are they there? (Personal choice? Official duty? Inertia?)

Q3: How much time do you have?

- Many formats exist:
  1min lightning talk; 17min talk + 3min questions;
  30min defence + 20min questions; 90min lecture; . . .

What does the audience expect?

Overestimating the audience is maybe the biggest error of beginners
- They often know much less than you expect
- They often care much much less than you expect
- They generally are less serious and attentive than you expect
- They almost certainly are less inquisitive or fierce than you expect

Most (computer science) audiences are:
- Friendly (often even actively worried about you doing well!)
- Welcoming to honest newcomers, but allergic to over-selling/arrogance/carelessness

Show that you care about your audience,
seek their feedback, and appreciate their attention.

Make it ease to listen to you – they are not machines that can focus all day!

Deciding what to talk about

A talk **never** allows you to discuss everything you know and did!

Preparation: Get an overview of your content
- What are the important ideas, techniques, and results?

⤳ spend 10min–30min on brainstorming key aspects,
without considering their order, mutual dependencies, or relative importance

Decide what you want to say:
- What is most important to you?
  What do you want people to remember after your talk?
- Which other details are needed to understand you?
- Do this based on your goals, the audience, and the time

⤳ phrase a take-away message that captures what you hope people will get

"But I have far too much to say for this little time!"

Novices find it difficult to exclude content, for various reasons:
- Narcissistic over-appreciation and emotional attachment to own works
- Misguided believe that talks must be comprehensive
- Inability to distinguish interesting insights from standard approaches

⤳ rushed presentations of incomprehensible technicalities without examples
(the audience understands little and remembers nothing)

Professional speakers have no time problem:
- Standard conference talks are 20min–30min (including questions!)
- Even keynotes are usually just 30min–60min (including questions!)
- TED talks are 18min

⤳ all of them have omitted most of what they know!
(the audience understands key ideas and many look up the speaker's work later on)

How much detail do I need?

The time problem often arises because speakers fail to abstract from their written work

Content that is often unsuitable for oral presentation:
- Full formal definitions
- Complete listings of long algorithms
- Detailed proofs
- Almost any other multi-line content copied literally from the report

If important, such content can be explained in various ways:
- Focus on simplified special cases of the research problem
- Use examples to convey idea of definitions, algorithms, and proofs
- Give proof sketches and algorithm outlines (if important)

Technical material can be over-simplified, as long as the main conclusions are preserved.
(You can just say so. Listeners who want all details must read the report anyway.)

A helpful idea when shortening

> The audience has a limited capacity for appreciation and understanding.

- Think of this as a limited resource that you can work with
- If your talk is too hard to follow (too fast, too few examples, too boring), then some of this resource will go elsewhere (such as answering emails)
- The more ideas you include, the less of the resource remains for each idea
- The more comprehensive and correct your presentation, the more time and attention is needed.

> "You can either say something true or something comprehensible."
> – Ian Pratt-Hartmann, keynote at DL Workshop 2013

However: Some ideas make no sense on their own and need other content to create a logical and catching story

Planning your story

> Every talk tells a story.

But this story is special in several ways:
- Talks are a strictly linear medium with a fixed playback speed
  ↝ listeners have no access to past or future slides and cannot choose their own pace
- Repetition must be explicit part of the structure
- Non-linear narratives and surprising turns confuse the audience
- Time is often too short for detours

Goal: a simple linear story that most people can follow

Challenge: the underlying research is often not linear and all but simple

How to design a story (1)

Given: Insights from initial analysis (important content, audience, goals)

Method 1: Talking to a friend

- "Explain" your work to a virtual (or maybe actual) listener – without slides
- Don't worry about timing yet
- In which order did you start to explain? Did you have to go back to clarify something that the other may not know? Did you hit points that you could not explain clearly in direct talk?

> Excellent talks give listeners the impression that the speaker is really talking to them, using slides only for convenient illustration or memory support.

How to design a story (2)

Given: Insights from initial analysis (important content, audience, goals)

Method 2: Sketching the story

- Draft a rough narrative structure on paper
- Split the talk time into equal-sized units on paper, e.g., corresponding to 3min each (virtual "slides", unrelated to the number of slides you'll need in the end)
- What are your main points (e.g., theorems)? What do you need to get there (explaining/defining/...)? Is most of your time used for what is most important?

> Seeing your story line graphically lets you optimise its natural flow and illustrates how much time you devote to various parts.

Beginning and ending

People are most attentive at the start and at the end of your talk.

Reasons:
- New and changing situations increase attentiveness
- Optimism bonus: listeners have positive expectations (or they would not be there)
- The last slide often remains on display during questions
- Primacy/recency effect: people best remember the first and the most recent information on a topic

Carefully think about what to start and end with!

(it might be the only thing that people can still remember a day after your talk)

Starting and ending (not so) well

Suggestion for talks up to 30min:
- Start by stating the problem and giving an outlook on the main results
- End with your take-away message (as formulated before), and brief list of achievements or next steps

Other common starts:
- Table of contents (rarely works well; mixes the boring with the incomprehensible; encourages dull delivery) (exception: a good speaker can use it to introduce the problem and results)
- Motivating example (may work and can extend attention span; but might be remembered more than your key points)
- Preliminary definitions (boring, unmotivated, not your key point)
- Related-work review (boring, often too lengthy for motivation, not your key point)

Other common ends:
- "Thank you!" in big letters (all-time favourite for least useful ending)
- Literature list (can be included in slides, but there is no point showing it)
- Future work only (de-emphasises your present work's main contribution)

The structure of your story

Start and end are also the defining points of the story you tell
- Stories are more coherent, memorable, and logical if start and end connect
- Your story should make sense as a whole, and not start in one direction and end somewhere totally different

This is related to the need for repetition in talks
- "Tell them what you are going to tell them, tell them, then tell them what you told them."
- Variation of perspective is key here (no dumb repetition!)

Additional waypoints are important to pick up listeners along the way
- Allow listeners to get (back) into your story during your talk
- Guiding phrases help (example: "Now after this complex proof idea, let's remember what our main goal was.") as do visual breaks (example: a slide announcing a new section, maybe with an interesting picture)

Examples

Talks greatly benefit from good examples.

Good examples serve in many ways:
- motivate your approach (by illustrating a problem)
- replace formal definitions or detailed algorithms
- tell a story (illustrate steps towards the solution)

A **running example** is an excellent device for talks. Switching between examples, possibly from different domains, stresses the listeners' attention.

⤳ Good examples for talks often need to be designed from scratch

(Examples from reports can sometimes be used or adjusted, but often they are not ideal.)

Summary

Oral presentations play a big role in your professional success

Phases of preparation: analysis, story, slides, words, practice, review

Talks cannot cover your whole work in all detail, but inform and attract potential readers

Powerful presentations tell a convincing and logical story

What's next?
- Media for oral presentations
- Presenting experimental results
- Good academic conduct