What I want to hear during a scientific presentation

Lorenzo Clemente
University of Warsaw

LMW@LICS'25 @ Singapore, 23/06/2025

Disclaimer

- What works for me needs not work for others
- Problems are more important than solutions
- Take what you like, discard the rest
- I do not believe all that I say
- This presentation will contradict itself
- We are all learning

You are the expert

You are the *best person* in the world to do research in your area

- You know all about the topic
- You can quickly get to the relevant technicalities
- You can quickly solve the easy problems

You are the *worst person* in the world to explain your area

- You forgot that it took quite some time for you to become an expert
- You cannot expect the audience to follow your journey in a short time
- You forgot the difficulties you had when mastering the topic

Anecdote

- At the beginning of my PhD I was a TA for functional programming course
- I never programmed in Haskell before
- I was learning the material in parallel with undergrads
- Best teaching experience ever:
  - I knew exactly what were the key difficulties in learning the topic

Take the point of view of the audience

What is the target of your presentation?

- Local seminar
  - most of the audience will not follow you
  - you have some time to lecture some basics
- Specialised technical workshop
  - most of the audience will follow you on the more technical part
- International conference
  - nobody will follow you
  - the audience will be tired, distracted, answering emails
  - can’t afford technicalities

Take the point of view of the audience

Conflicting objectives

- You
  - Want to show your great technical achievement.
- Me (the audience)
  - Won’t be able to digest technical content in a short time.
  - Want to connect your achievement with what I know already.
  - Want to know what is new vs. what is known.
  - Want to know what is easy vs. what is difficult.
  - Want to know why the result is relevant.
  - Want to know how can the result be applied.

How learning works

Learning is about connecting different concepts.

- Present new concepts by connecting them to common background.
  - Minimise the amount of new information.
  - If unsure whether something should be included or not, remove it.
- Skip formal definitions, but say how it relates to the rest.
- BUT! No shortcuts
  - Better to avoid a semi-formal statement if it will confuse people
  - You will be punished by a lot of questions

Strategies

Place your result in the bigger picture

- Refer to previous works
  - helps the experts to categorise your result
  - acknowledges prior work
  - likely some member of the audience contributed to the topic

Stress what are the difficult/non-trivial steps

- non-experts need to be told what is easy and what is not

Strategies

Avoid formal definitions

- Focus on *what* a definition achieves rather than on *how* it achieves it

Technical concepts best explained

- in analogy to well-known concepts
- by simple examples
  BUT!
  - good examples are difficult to construct
  - it may not be clear what are the key ingredients
  - don’t get carried away too much with complicated stories

Progressive escalation of content

(A) Everybody knows it
(B) Somebody knows it
(C) Nobody knows it

Idea: Give everybody something to take away from the presentation

(A) => (B): Everybody should learn something new
(B) => (C): Somebody (the experts) should learn something new

An example

(A) Everybody knows it

Let a series f_1 be *regular* if there are generators f_2, …, f_k s.t. for every input symbol a, the left derivative of generator f_i by a belongs to {f_1, …, f_k}
(this is in analogy to DFA and regular languages)

(B) Somebody knows it

Let a series f_1 be *rational* if there are generators f_2, …, f_k s.t. for every input symbol a, the left derivative of generator f_i by a belongs to the linear span of {f_1, …, f_k}
(this introduces the new notion of linear span)

(C) Nobody knows it

Let a series f_1 be *shuffle-finite* if there are generators f_2, …, f_k s.t. for every input symbol a, the left derivative of generator f_i by a belongs to the algebra generated by {f_1, …, f_k}
(this introduces the new notion of algebra)

Presenting other people's work

Some of the best presentation I've seen were about the work of other people

- A member of the audience delivers the presentation!
  => They focus by construction on what the audience wants to hear
- They avoid the common pitfalls
- They are not technical
- They are easy to follow
  - cognitive bottleneck of the speaker
- They focus on what is known already

Idea: Conference where we present each other's results?