Guidelines for Giving Good Talks

Andrej Košmrlj

May 10, 2018

Professional Development Lunch Talk for MAE Graduate Students, Princeton University

Resources for giving good talks

Uri Alon (Weizmann)

How to give a good talk?

U. Alon, Molecular Cell 36, 165 (2009)

https://www.youtube.com/watch?v=5OFAhBw0OXs

Susan McConnell (Stanford)

Designing effective scientific presentations

https://www.youtube.com/watch?v=Hp7Id3Yb9XQ

Outline

Preparation

Choose premise for entire talk Title each slide with its own premise

Questions

Listen and repeat the question Answer its content, not its tone

Presentation

Make eye contact with audience

How to decide what to talk about?

Talk about something that you are passionate about

Choose the premise for your talk (single sentence!)

Victor Weisskopf (MIT): "It is better to uncover a little, than to cover a lot."

Talk is a story

Good talk flows like a story.

Talk should present a motivation, central problem to be resolved, the resolution and future questions.

The most important part is to clearly present the question or problem.

Remove everything that is not important for the story.

Do not show too much data. Show only as much data as is needed to understand the story.

Tailor the talk to your audience (experts, broad audience, ...) Do not go over time!

Talk organization

• Title

- "Hook"
- Introduction What is the background & significance?
- Present the central question / problem
- Outline / Roadmap
- Results What was done, what was found?
- Discussion What are the implications?
- Summary
- Acknowledgements

Style of slides

- Put one topic on each slide
- Title should explain the premise of a given slide
- "Less is more"
- Make the essential points, leave out the rest
- Remove everything that you are not going to discuss
- Stick with one style for slides
- Include slide numbers



bo crowded

8

On crowded slides you are going to lose the focus of your audience.

They have no idea if they should be listening to you, or reading the text, or if they should be focusing on one of the figures.





Even if you tell them to focus on the specific figure, their mind will wander around and look at other figures and text.

Style of slides

People perceive information differently: listening, reading, visual, experience (demos)

> Each slide should contain a simple graph, image or video

Use analogies to help convey the message

Limit text blocks to two lines

Use intuitive symbols and be consistent

Define terminology and avoid unnecessary jargon

It takes effort to make good slides. Slides should help the audience!

ID Example: Thermal fluctuations of microscopic shells

Flickering of red blood cells



Thermal fluctuations arise from collisions with surrounding molecules



 $\approx 10 \mu \mathrm{m}$

https://www.youtube.com/watch?v=VwhNLaRCD-4

How thermal fluctuations affect mechanical properties?

Thermal fluctuations increase effective bending rigidity, which is size dependent

universal exponent

\overbrace{L}

fluctuating sheet

thermal length scale

 $\ell_{\rm th} \sim \frac{\kappa_0}{\sqrt{k_B T Y_0}}$

 κ_0 bending rigidity at *T*=0 Y_0 Young's modulus at *T*=0 T temperature

 k_B Boltzmann constant



D. Nelson and L. Peliti, J. de Physique 48, 1085 (1987)

J. A. Aronovitz and T. C. Lubensky, PRL 60, 2634 (1988)

E. Guitter, F. David, S. Leibler and L. Peliti, J. de Physique 50, 1787 (1989)

Analogy: mechanics of crumpled paper



Picture from Melina Blees, U. Chicago

Mechanics of thermally fluctuating sheets is similar to the mechanics of crumpled paper!

Leave empty space near boundaries

13

Sometimes projector is misaligned with the screen and your text/images near boundaries gets cut

Audience in the back rows may not be able to see the bottom part of the screen

Use appropriate font size

too small fonts 10 points 15 points 20 points

appropriate size fonts 25 points 30 points 35 points 40 points

too large fonts 45 points 50 points 55 points

Appropriate color scheme - high contrast ¹⁵

dark colors on light background are good

light colors on dark background are good

Avoid light colors on white background!

grey yellow cyan green

Avoid red-green combinations many people are red-green color blind!

Lots of people cannot read this - even if they could it makes your eyes hurt

Make graphs and images easy to read 16 appropriately label axes and legends make fonts sufficiently large add/label scalebars remove data that you are not going to discuss clearly explain what each graph and image is showing (this is the first time the audience is seeing it!) cite the relevant literature





Make sure embedded movies work



Outline

Preparation

Choose premise for entire talk Title each slide with its own premise

Questions

Listen and repeat the question Answer its content, not its tone

Presentation

Make eye contact with audience

Do not talk to the screen!



Communicate with your audience

Eye contact promotes two-way communication



How to overcome stage fright?

Most people are nervous when giving talks

Practice your talk out loud many times (do not memorize it!)

Stage fright is the largest at the beginning (memorize the first 5 sentences)

Tell yourself an empowering story: "Instead of coming before a pack of wolves, you are a shepherd leading the audience, holding each member's hand through a fascinating story. You will care for them and make sure they are with you."

If you have a friend or two in the audience, imagine that you are having a conversation with them, and then gradually include the entire audience.

Engage your audience

Start slowly

Make eye contact with your audience

Use your hands to communicate

Share your excitement about research

Wake your audience up (with a surprise, demo, video). Attention span is decreasing over time. Audience gets distracted with their phones, etc.

Do not distract audience from the topic ²³

Avoid distracting PowerPoint/ Keynote animations No dancing baloney No nervous gestures No distracting clothing



https://giphy.com

No rapid movements of your laser pointer



https://www.youtube.com/watch?v=aLagODygcbs

The secret weapon

Motivation

Motivate the steps taken

Motivate the next slide while still on the previous slide.

A well organized talk flows like a story.

by Ned Wingreen

Outline

Preparation

Choose premise for entire talk Title each slide with its own premise

Questions

Listen and repeat the question Answer its content, not its tone

Presentation

Make eye contact with audience

Taking questions

Questions period can be very stressful for many speakers.

Look person in the eye and listen carefully until the end of their question.

Repeat the question in their words, so everyone can hear it and you can have time to understand it.

Check the eyes to see if you got the meaning. If not, ask for more content.

Acknowledge good questions.

It's ok to say, "I don't know", "I didn't think about this before", "Let's talk about it offline", or "That is very important criticism".

Note: distinguish the aggressive tone from the content of the question!

Summary

Preparation

Choose premise for entire talk Title each slide with its own premise

Questions

Listen and repeat the question Answer its content, not its tone

Presentation

Make eye contact with audience

Resources for giving good talks

Uri Alon (Weizmann)

How to give a good talk?

U. Alon, <u>Molecular Cell</u> **36**, 165 (2009)

https://www.youtube.com/watch?v=5OFAhBw0OXs

Susan McConnell (Stanford)

Designing effective scientific presentations

https://www.youtube.com/watch?v=Hp7Id3Yb9XQ