Guidelines for Giving Good Talks

Andrej Košmrlj

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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
How To Give a Good Talk

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

U. Alon, Molecular Cell 36, 165 (2009)
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
Gravitational method:

Theory for \( \frac{1}{2} \) to \( \frac{1}{4} \)

Counts...

Fig. 3 calculated from the photonic crystals in the comb-rows of this species (images first published in...

...producing structures, such as multilayer reflectors. Pointillism has been described in multi...

...to be resolved individually by the naked eye, meaning that an observer sees light of a range...

...1998...

...areas of slightly distorted lattice in the linking regions, whilst in other cases, the domains are...

...approximately 100 species of extant comb-jellyfish have been described, all of which...

...The comb-jellyfish (ctenophore)...

...does not change the spring constant...

...fraction amplitude. Although the presence of water (the aqueous solu...

...considerable crumpling of the graphene...

...of plane, but does not notably stretch in plane (Fig. 1b). The process is...

...resulting displacement (Fig. 2a). We also measure thermal fluctuations...

...Thermal method:

...Knisley and Schultz 1997...

...RESEARCH...

...Beroë cucumis (eV)...
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!
Example:
Thermal fluctuations of microscopic shells

Flickering of red blood cells

Thermal fluctuations arise from collisions with surrounding molecules

How thermal fluctuations affect mechanical properties?

https://www.youtube.com/watch?v=VwhNLaRCD-4
Thermal fluctuations increase effective bending rigidity, which is size dependent.

\[ \ell_{\text{th}} \sim \frac{\kappa_0}{\sqrt{k_B T Y_0}} \]

- \( \kappa_0 \): bending rigidity at \( T=0 \)
- \( Y_0 \): Young’s modulus at \( T=0 \)
- \( T \): temperature
- \( k_B \): Boltzmann constant

\[ \eta \approx 0.80 - 0.85 \]

\[ \frac{L}{\ell_{\text{th}}} \sim \frac{L}{\kappa_0} \sqrt{k_B T Y_0} \]

Sheet size, temperature


Analogy: mechanics of crumpled paper

Crumpled paper is harder to bend.

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

Picture from Melina Blees, U. Chicago
Leave empty space near boundaries

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
  - 5 points
  - 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

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
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

error: media not found
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U. Alon, Molecular Cell 36, 165 (2009)
Do not talk to the screen!

Speaker facing screen does not make contact with audience

Communicate with your audience

Eye contact promotes two-way communication

speaker

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

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

Avoid distracting PowerPoint/Keynote animations

No dancing baloney

No nervous gestures

No distracting clothing

No rapid movements of your laser pointer

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

https://giphy.com
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
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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!

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   - Make eye contact with audience

The three principles of a good talk are:
- Premise
- Eye Contact
- Titles

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