Giving a Talbot Talk

Below is a sort of style guide for a 'good' Talbot talk. Any such document is riddled with personal bias on the part of the author; no attempt has been made to remove this bias. We do not claim that following these guidelines will lead to a good Talbot talk, nor that breaking them will lead to a poor Talbot talk. We have simply tried to collect some common characteristics of successful Talbot talks, and warn against some features of less than successful Talbot talks.

The preceding remarks remain in force throughout, despite the authoritative tone of the rest of the document.

Goals and general advice

Talbot is neither a course nor a conference: it is a workshop. The talks form a narrative, but time is limited. A single talk often contains upwards of a week's worth of 'course material', and it is impossible to explain all the details in the time allotted. On the other hand, participants must understand enough from each talk to continue following the story. We'll give tips on striking a balance below.

Your audience

- You may assume that your audience is familiar with the prerequisites stated in the description of the workshop.
- You may assume they are quasi-familiar with the material in all the talks preceding your own.
- Your audience is not familiar with anything beyond that, so you shouldn't pretend that they are.

  [This means that you may wish to begin your talk by reviewing necessary material from previous talks. When doing so, aim for being more conceptual than technical.]
- If you need to use Theorem X and you assume a previous talk discusses it, contact the speaker of said talk and make sure they actually plan on covering Theorem X.
- When your speaker accidentally runs out of time and doesn't mention Theorem X, have a back-up plan. (This won't happen if your speaker's talk is titled "Theorem X", but may very well happen otherwise.)

Tell your part of the story

- Your talk is part of a narrative, so you should be superficially aware of the whole plot and know your place in it.
- If possible, foreshadow future talks with your choice of examples and presentation, and connect back to previous talks.

Provide tools for later use

- If participants will need Theorem X from *your* talk for a later talk, be sure to package it in a way that will be easy to access later.
- Maybe some concrete instance of Theorem X reflects most of the content, and is easy to remember; then be sure to cover this concrete instance.

- Maybe future talks will really only need Corollary Y, in which case you should emphasize that.
- Slogans are also helpful: maybe Theorem X has a long, technical statement, but can be summarized informally as "Every nice widget can be filtered by gadgets."
- Ideas are easier to remember if you tell me where they fit into the big picture. Ideas are easier to remember if I have a concrete example. Ideas are easiest to remember if I have both.

Formal vs. non-formal

- Some arguments are formal- they follow from general principles, and don't use much about the specific situation you're in. Some arguments are not- you need to know that $\pi_1 S = \mathbb{Z}/2$ or something. Be very clear about which is which, during your talk.
- What is the 'key thing' that makes that proof work? Here, a thing is 'key' if, supposing you knew the theorem statement and that thing, you could plausibly reconstruct the proof. Some statements are straightforward enough that you only need the statement; others have more than one 'key' required to unlock them.
- If an argument is formal, it may be helpful to point out in what generality the argument applies. On the other hand, this can sometimes just be annoying. Use your best judgement.

  "This part actually works for any group, not just cyclic groups" is a good example of the former,

  "This is true in an arbitrary ∞-topos" is often an example of the latter.[1]

Ask for help

In no particular order:

- Ask your friends for help.
- Ask your advisor for help.
- Ask the organizers for help.
- Ask the other speakers for help.
- Ask the mentors for help.

Give a practice talk!

Seriously. Do it.

Giving a nonsense talk

The following might be useful if your talk is on abstract nonsense (like categorical background).

[1] I say this as someone who has nothing but affection for ∞-toposes.

Avoid strings of definitions

- Your talk *description* may be a string of words to define. Your *talk* should not be a string of words and their definitions.
- Break up definitions with examples (see below).
- Motivate definitions whenever possible.
- Have, at the ready, some *non*-examples as well.
- Often, technical definitions are trying to capture some intuition about a 'Platonic' version of that object. What is that intuition? Go beyond the shadow on the wall...

Temper with examples

- Before or immediately after a definition, give an example.
- Before or immediately after stating a general/abstract theorem, say how it applies to the example you wrote down earlier.
- Try to give several flavors of examples.

  Generic examples: most gadgets in nature are like this one.

  Featured examples: we'll be most interested in this one, during Talbot.

  Counterexamples: the world is a scary place.

Try to remember: theory is built for a purpose. Even Grothendieck's rising sea is meant to flood an *island*.

Giving a computational talk

The following might be useful if your talk is about a technical computation.

Temper with big picture

- Give an outline of the argument/computation.
- Tell us where we are in that outline along the way.
- Why do we care about this computation?

  Is it an example of some abstract machine or invariant we built earlier?

  Is it used later to prove some theorem?

  Is it just awesome?

- In these talks it's extra important to tell the audience what is formal and what is non-formal.
- Draw pictures!

Work out small examples in detail

- If your computation has parameters in it, spell out the answer for various extreme and simple values of those parameters.
- This is especially useful if the example is just complicated enough to exhibit a bit of non-trivial phenomena which is characteristic of the general case.

  For example: power operations and their properties for the mod p homology of $\mathcal{E}_n$-algebras is pretty complicated. But the answer when $n = 2$ and $p = 2$ is both simple and illuminating.
- If there is a spectral sequence, draw it or show us a picture.
- On the other hand, don't expect us to fully digest the picture. Instead, point out qualitative features that we need to know.

How did anyone ever come up with this?

- What is the history behind this argument? Maybe the mentors have insider knowledge about this- ask them!
- Can you reconstruct pieces of the argument by following general heuristics? What are they?

  e.g. "Compute one easy case, and then resolve your complicated thing by easy cases."
- Is there a 'fake' argument that doesn't quite work, but if you try to fix it you recover the actual argument?

  e.g. "You'd *like* to say that this functor has property X, but that isn't true. On the other hand, our specific diagram has property Y, which might be all we need, so we can try..."