

# EARLY CAREER

The Early Career Section offers information and suggestions for graduate students, job seekers, early career academics of all types, and those who mentor them. Angela Gibney serves as the editor of this section with assistance from Early Career Intern Katie Storey. In our next issue, we will feature articles in celebration of Black History Month. All Early Career articles organized by topic are available at <https://www.angelagibney.org/the-ec-by-topic>.



## More Good Ideas Don't Give a Terrible Talk

*Elena Giorgi*

We have all been to terrible talks. To avoid being the one who delivers a terrible talk, we should first know what it is that makes a talk terrible, and then do the opposite.

### A terrible talk...

#### ...gets too technical

The most common mistake that a speaker makes is believing that the audience knows as much as he/she does on the

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subject. You should always remember that the background of the audience can vary greatly: there will probably be people who are very close to your work (and may have invited you to give the talk for example), but there could also be those working in adjacent fields who want to attend the talk because they may be interested in some aspects of your work. A good way to avoid misjudging the background of the listeners is to ask the organizers beforehand about the audience members: how heterogeneous is the audience? are there people from other fields? how many students or postdocs? Having this information will help you prepare the material accordingly.

Another common mistake is to assume that the audience is listening to your talk with full attention for its entire duration, for example having clear in mind at the end of the talk something you said at the beginning. Don't be afraid to repeat concepts, especially the ones you introduced in a different part of the talk which may be useful in a subsequent moment. Even the audience members who listened carefully will benefit from your recap.

In order to make your talk more understandable, whenever possible you should include images, as well as graphs, tables, arrows, and any visual aid you can think of. Explore these tools and use them to make your talk more enjoyable.

#### ...is not accessible to nonexperts

Those who are in the audience but are not expert in your field of research may not be able to appreciate the crucial technicalities that make the core of your work and that you spent time developing. Even though you really want to share the technical aspects of your work, try to elevate the argument as much as possible and start by presenting a simplified version of the main ideas. If anyone is interested in more technical details, you will be able to present them in a private discussion after the talk, which is also a great way to start a conversation with a fellow mathematician.

Always remember: your goal is to make people understand, not to impress them. This is true even in a job talk: be understandable and the audience will be impressed as a consequence.

#### ...does not have a clear narrative

A clear narrative is crucial in every aspect of human learning, and that is true in mathematics as well. A talk is not just a list of new ideas and proofs: it is a story, and as all narrated stories it should be engaging to the listeners. Keep in mind that the narrative may not be the linear history of your attempts at solving a problem. The story of your talk

could be something you realize about your research project only months or years later, where two distant concepts are connected by an idea, or a method can be used in different settings uncovering something new.

Spend some time identifying the story of your talk: the main problem, its genesis, the relevant attempts, its resolution, and what is missing from its current status. Make the narrative clear during your talk: when giving a definition or presenting a lemma, frame it as part of the story by alluding to its role in it. Presenting something you tried but did not work is also a good example of constructing a narrative, and it is very instructive for your audience who may be wondering about similar directions.

A narrative helps the audience follow your talk and pay attention. Humor is also a great way to keep people engaged. Always remember: to deliver a great talk, you are as important as the words you will be saying. Use your body and tone of voice to be emphatic and passionate; be a pleasure to listen to.

### ...overlooks the motivations and the conclusions of your work

Why are you doing what you are doing? It may seem obvious to you, so obvious that you forget to mention it, but it is one of the most important parts of your talk. Start your talk with a presentation of the motivation for your work, not only your personal motivations but also those that could be inspiring for other people, both internal and external to your field of research.

Give some history of your problem by positioning it in the larger context of your field. Include a long introduction where you can touch on the take-away message of your talk. End your talk with clear conclusions: a brief summary of your talk is particularly helpful for those who may have gotten lost at a certain point.

### ...does not respect the audience

Nobody wants to feel stupid, so don't make them. Saying things like "it is trivial" or "it is obvious" is disrespectful towards your audience, who may not consider as trivial or obvious any of the things you mentioned, as they have not been thinking about them as much as you have.

It is important to show real openness to questions: ask often if anybody has any questions, and ask it repeatedly, with particular attention to the younger audience who may be frightened to ask. Another way to respect the audience (in the room or outside) is to always refer to the relevant work of other people.

### ...goes over time

If you don't want to give a terrible talk, don't go over time. There are various reasons why your talk can end up running over time, but it is important to find a way to avoid it, no matter the reason.

The most common reason is that the talk was not adequately prepared: you thought you were able to say more

than actually possible in the given amount of time. There is an easy fix to this: plan in advance with realistic expectations, and if uncertain, it is better to make it shorter to avoid looking stressed and anxious when trying to finish on time.

It is also possible that you are not able to finish the talk on time due to no fault of your own, for example because you received lots of questions from the audience. It is normally a good sign if the audience is engaged with your talk and asks many questions. If this happens, when the time is almost up and you realize you didn't have time to get to the points you wanted, summarize the most important take-home message and try to connect them to some of the previous questions. Be at peace with yourself: answering the questions of your audience is far more effective at explaining your work than finishing at all costs your pre-planned talk.



Elena Giorgi

### Credits

Photo of Elena Giorgi is courtesy of Columbia University: April Renae.

## Making Accessible Documents Using LaTeX

### *Eric Larson and Isabel Vogt*

In order to disseminate mathematics as widely as possible, it is desirable to produce documents which are accessible to people with visual impairments. Indeed, there is a long history of successful blind mathematicians (including Euler late in life [J]), yet visual impairments can pose an obstacle to the written communication of mathematics. In the modern era, screen readers are a major way that blind individuals interact with written (electronic) documents. Unfortunately, without special effort, screen readers will typically garble equations, often beyond comprehensibility.

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