The Do's and Don'ts of Giving a Math Talk

Adam Van Tuyl

Lakehead University

November 2011

Caveats

- What follows is mostly for short math talks, e.g., one hour or less. Some of advice doesn't apply to a lecture series (2 or more lectures)
- The advice has been "borrowed" from a number of places:
    - *A Primer of Mathematical Writing.* American Math. Society, Providence (1996, Steven G. Krantz).
    - *A Mathematician's Survival Guide American Mathematical Society,* Providence, RI (2004, Steven G. Krantz).
    - *How to give a good 20 minute math talk*, William T. Ross `http://blog.richmond.edu/wross/2008/03/26/how-to-give-a-good-20-minute-math-talk/`
- 15 years of attending good (and bad!) math talks.
- A lot of this is my opinion! Double check with your advisor.

Your audience

Don't

Talk to the only expert in the room.

Do

- *Think about who you are going to talk to and their level of mathematics.*
- *Layer your talk: (1) something for everyone, (2) a peer, (3) an expert.*

For Math 4301, can assume your audience has taken up to second year math courses.

Preparation

Don't

Wait to the last minute to make your talk.

Do

Prepare you talk in advance, thinking about about the structure of the talk.

For Math 4301, we force you do this!

Preparation

Don't

Assume that the technology will work.

Do

Have a backup plan if the technology fails (e.g. multiple copies of your talk). Familiarize yourself with the room before you give a talk.

Preparation

Don't

Make your talk up on the spot.

Do

Practice! Practice! and Practice! (did I mention Practice?)

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Presentation

Don't

Make the audience play "Follow the Bouncy Laser Pointer".

Do

Go to the screen, and touch the points you want to highlight.

Presentation

Don't

- *Stand in one place.*
- *Rock back in forth.*
- *Play with the change in your pocket.*
- *Speak in a monotone.*
- *Hold notes or "props" (e.g. water bottles).*

Do

Move around, engage the audience, vary your voice. "Talk with your hands".

Presentation

Don't

- *Talk to the screen (we're behind you!)*
- *Talk to one person.*

Do

Talk to your audience.

Presentation

Don't

Apologize.

Do

Be confident about the material. Anticipate questions and difficulties.

Presentation

Don't

Read your slides (we can read!). In particular, don't read formulas.

Do

Explain what is on the slide, and describe things like formulas.

Example

Lemma

The number of generators of I_X is given by

$$\underbrace{\left[\binom{d+n}{n} - |X|\right]}_{\#\text{ of gens of degree } d} + \underbrace{\left[\binom{d+1+n}{n} - |X| - \dim_k W\right]}_{\#\text{ of gens of degree } d+1}$$

Slides

Don't

Make illegible audio-visual material

Do

Make slides for your talks (PowerPoint, Beamer class for LaTeX)

Don't

Use "Dancing Baloney"

Do

Simple slides

Slides

Don't

Put lots of information on the slide.

Do

Put key concepts and ideas on the slide.

Slides

Don't

Use poor font choices.

Do

Use high contrasting fonts and colours

Slides

Don't

"Strip-Tease".

Do

Show the entire slide.

Slides

Don't

Use lots of slides

Do

Use your slides judiciously (some people say no more than 1 slide per minute, some say 2-3 minutes per slide)

Example

We need to count the number of generators of degree $d+1$. Set

$$W = R_1(I_X)_d = \{LF \mid L \in R_1 \text{ and } F \in (I_X)_d\} \subseteq (I_X)_{d+1}$$

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Conjecture (Ideal Generation Conjecture)

Let X be a set of points in generic position in $\mathbb{P}^n$. If $W = R_1(I_X)_d$, then

$$\dim_k W = \max\left\{(n+1)\dim(I_X)_d, \dim_k (I_X)_{d+1}\right\}$$

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In other words, elements of W either "spread" out as much as possible, or they "cover" all of $(I_X)_{d+1}$.

Known Cases (non-exhaustive)

- $\mathbb{P}^2$ (Geramita-Maroscia) $\mathbb{P}^3$ (Ballico)
- For $|X| \gg n$ (Hirschowitz-Simpson) [in fact, they proved $|X| > 6^{n^3 \log n}$]

Don't

Give a vague, imprecise title. E.g. "On a paper of Euler".

Do

Give an interesting title. E.g. "Euler's paper on the Konigsberg Bridge Problem: the birth of Graph Theory"

Math Content

Don't

Give lots and lots of new definitions, and use complicated notation.

Do

Limit the number of new definitions and concepts (five or less, if possible) Where possible, limit the use of notation.

Math Content

Don't

Jump to the most general result.

Do

Give examples of special cases and small examples.

A DO or a DON'T???

Don't

Give any proofs.

Do

Give some proofs.

This is really subjective, and depends upon the topic.

My answer: "It depends"

Math Content

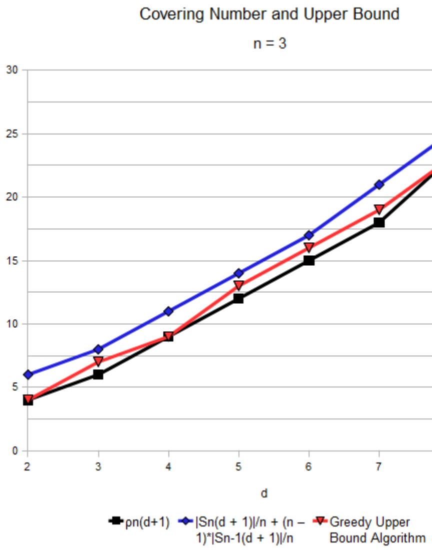
Don't

Give pages and pages of data.

Do

Present a graph or table or figure when possible.

Comparison of Upper Bounds for $\rho_3(d+1)$



d	$\rho_3(d+1)$	Explicit UB	GUB
2	4	6	4
3	6	8	7
4	9	11	9
5	12	14	13
6	15	17	16
7	18	21	19
8	23	25	23
9	27	29	28

The End

Don't

Simply end your talk.

Do

Provide a slide with some concluding remarks. These remarks can be about questions you still want to look at, some things you haven't had a chance to talk about.

The End

Don't

Stop your talk by asking your audience for questions.

Do

End by thanking the audience. Normally, the person who introduced the talk is in charge of asking for questions.

The End

Don't

Go over time

Do

Never, Never, Never, Never, Never, Never, Never go over time!! It shows disrespect for the audience and shows that you were unprepared. Make your talk with multiple exit points.

In Math 4301, I will make you stop.

Concluding Remarks

- Practice!
- Don't go over time!
- Talk to your advisor.