How to give a research talk

Thomas D. Nielsen

September 2008
The purpose of your talk ...

... is not to

- impress the audience with your brainpower
- tell them all you know about the topic
- present all the technical details
The purpose of your talk ...

... is to

- give the audience a taster for your work
- present the key ideas, intuitions, and results
- make the audience interested
Preparing the presentation

Deciding on what to say and what to omit

- Who is the primary audience?
- If only one thing should be remembered from the talk, what should it be (be specific, what is the key idea)?
Preparing the presentation

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In general

Convey the essential part of your paper, but don’t overwhelm the audience with too much material.

- It is better to leave out certain details than to give a superficial treatment of everything or to overrun your time.
- Adopt a nonuniform approach when preparing the presentation.

That does not mean holding back important details - merely omitting less important ones!
Structuring the presentation

Guiding the audience

People often use a contents slide:

- Introduction
- Bayesian networks
- Graph concepts
  - Domain graphs
  - Triangulated graphs
  - Join graphs
  - Join trees
- Junction trees
- Message passing

Reconsider!

Instead

- it can be useful to show an outline slide at the start of a section, to help the audience stay on track (or help those who got distracted or lost to rejoin you).
Structuring the presentation

Introduction

Remember: If you bore the audience the first few minutes, you may never get them back ⇒ jump right in!
- Give an example to motivate the problem you are working with!
- Avoid launching into technical details that will confuse the audience.
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Conclusion

For conferences, end your presentation with a contributions/conclusions slides to help the audience remember what to take home from the presentation.
- What should be the last thing the audience sees?
- Don’t be afraid to include open problems.
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The body

... What to put in ...

Conclusion

For conferences, end your presentation with a contributions/conclusions slides to help the audience remember what to take home from the presentation.
- What should be the last thing the audience sees?
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What to put in?
What (not) to put in?

It is usually difficult to follow highly abstract presentations!

Definition

1. **X**: mixed $n$-dimensional random vector. $Y = (Y_1, \ldots, Y_d)$, $Z = (Z_1, \ldots, Z_c)$ its discrete and continuous parts. A function $f : \Omega_X \mapsto \mathbb{R}_0^+$ is a Mixture of Truncated Exponentials potential (MTE potential) if for each fixed value $y \in \Omega_Y$ of the discrete variables $Y$, the potential over the continuous variables $Z$ is defined as:

   $$f(z) = a_0 + \sum_{i=1}^{m} a_i \exp \left\{ \sum_{j=1}^{c} b_{i}^{(j)} z_j \right\}$$

   for all $z \in \Omega_Z$, where $a_i$, $b_{i}^{(j)}$ are real numbers.

2. $f$ is an MTE potential if there is a partition $D_1, \ldots, D_k$ of $\Omega_Z$ into hypercubes and in each $D_i$, $f$ is defined as above.

Ask yourself

Have I illustrated this concept/definitiontheorem ... with an example?
What (not) to put in?

Examples

Use examples to motivate and help the audience

- Convey basic intuition
- Illustrate main idea
- Show extreme cases
- ...

What to include?
What (not) to put in?

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Triangulation

Triangulation by elimination

Eliminating a node: Make all its noneliminated neighbors complete and remove the node.
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People can only read or take in very limited information: six or seven things on a slide is quite enough.

- Slides shouldn’t repeat what you plan to say, but rather emphasize it.
- Plan to talk about what’s on the slides rather than read them.
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Contents

- Don’t overwhelm the audience with mathematical details. Remember to explain the (non-standard) notation being used. Maybe include a few backup slides.

Technical details

$$Q = \frac{1}{2} \sum_{i=1}^{N} \text{tr}(\Gamma_{y_i}^{-1} \mathbb{E}(\mathbf{X} \mathbf{x}^T | \mathbf{D}_i)) + \sum_{i=1}^{N} \mu_{y_i}^T \Gamma_{y_i}^{-1} \mathbb{E}(\mathbf{X} | \mathbf{D}_i) - \sum_{h=1}^{\text{sp}(Y)} \frac{\#y_h \mu_{y_h}^T \Gamma_{y_h}^{-1} \mu_{y_h}}{2} - \ldots$$

- Use descriptive slide titles.
- Avoid a presentation that is just dozens of pages of text.
- Use figures! But be also sure to explain them.
- Use colors (when it is meaningful).
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Rule of thumb: about 2–3 minutes pr. slide.
Working out the slides

Style

- Do not use non-single-color backgrounds, transition effects, and similar eye candy. It shifts the focus from what is important, the contents.
- Avoid jitter when using overlays.
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- Avoid using the reveal technique
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- Avoid jitter when using overlays.
- Avoid using the reveal technique too excessively unless there is a point.
- Use a sans-serif font for your slides.
- Handwritten slides are fine, but use permanent ink.
The presentation

How to give a research talk

September 2008
Point at the screen not at the laptop
Speak to someone at the back of the room
Make eye contact with the audience (don’t talk to the screen). This makes them more “involved” and also helps you “read” their reactions.
Use rehearsal talks, rehearsal talks, rehearsal talks, ...

"If you’re going to make friends, Larry... you must learn there is a fine line between eye contact and the piercing stare of a psychopath."
Point at the screen not at the laptop
Speak to someone at the back of the room
Make eye contact with the audience (don’t talk to the screen). This makes them more “involved” and also helps you “read” their reactions.
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Most importantly: Be enthusiastic!
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Looking up material

Lazy propagation: A junction tree inference algorithm based on lazy evaluation - [tag]
AL. Martens, FY. Jensen - Artificial Intelligence, 1999 - Elsevier
... L AZY propagation: A junction tree inference ... The cliques of the junction tree are
connected by separators such that the so-called junction tree property holds. ...
Cited by 72 - Related articles - Web Search - All 7 versions

From Influence Diagrams to Junction Trees
... This approach involves a special triangulation of the underlying graph, the con-
struction of a junction tree with special properties, and a message ...
Cited by 137 - Related articles - View as HTML - Web Search - Find in bibliotek.dk - All 4 versions

Optimal Junction Trees
FY. Jensen, FY. Jensen - To appear in Proceedings of the Tenth Conference on ..., 1931 - ca.wisc.edu
... In the next part, we give a simple algorithm for constructing an optimal junction
tree from a triangulated network; ..., construct a junction tree over the cliques. ...
Cited by 105 - Related articles - View as HTML - Web Search - Find in bibliotek.dk - All 10 versions

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SK. Andersen, KG. Olesen, FY. Jensen, FY. Jensen - Proceedings of the Eleventh International Joint Conference ..., 1989 - dl.iiit.ac.in
... transforms into a tree structure, a junction tree. Here ... as a tree, a junction
tree, and by providing the operations for propagation ...
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... model: Models probabilistic: Causal probability: Causality: Causality: Structure arborescent;
Tree structure: Estructura arborescente; Belief universes: Junction tree.
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Blocking Gibbs Sampling in Very Large Probabilistic Expert Systems
... paper suggests and evaluates a variant of Gibbs sampling (Geman & Geman 1984) involving
simultaneous sampling of sets of variables using the junction tree ...
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Looking up material

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1. **Graphical Models in R**
   SL Lantuizen - Resampling Methods in R: The 2002 Package - ucdex
   Vol. 2/3, December 2002 39 R graphical Models in R
   A new initiative within the R project Steffen L. Lantuizen What is this? In September 2002 a small group of people gathered in Vienna for the brainstorming workshop of a new journal 2002 with the...
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2. **Bayesian Networks and Decision Graphs** - [aa.dk](http://scholar.google.de/scholar?hl=en&lr=&q=Bayesian+Networks+and+Decision+Graphs)
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3. **Probabilistic Networks and Expert Systems**
   RG Cowell - 1999 - books.google.com
   Cited by 998 - Related articles - Web Search - Find in bibliotek.dk - All 2 versions

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**Learning Bayesian networks**
RE Neapolitan - Proceedings of the 13th ACM SIGKDD international conference .... 2007 - portal.acm.org
Google, Inc. Subscribe (Full Service), Register (Limited Service, Free),
Login, Search: The ACM Digital Library The Guide, ...
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**Bucket elimination: A unifying framework for probabilistic inference** - [ucl.edu](http://scholar.google.de/scholar?hl=en&lr=&q=Bucket+elimination%3A+A+unifying+framework+for+probabilistic+inference)
R Dechter - Learning in Graphical Models, 1996 - books.google.com
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Looking up material
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The presentation

How to give a research talk September 2008
A couple of references

