Creating beautiful presentations

Ryan Johnson

With special thanks to:
Natassa Ailamaki, CMU CALCM lab, Markus Püschel

Does this stuff really make a difference?

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Why do we Care about Presentations?

- In contrast to a paper or other technical writing, you present your work and yourself
- People remember good presentations:
  - Good content
  - Well presented
  - Well-designed slides
- Many of my colleagues and I put a lot of effort into each presentation, and at the beginning of a career it's even more important

What's wrong here?

This slide (and all others with red headings) by Markus Püschel
Why do we Care about Presentations?

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**What’s wrong here?**

Presentations Are Very Important

- You present your work and yourself.
- People remember good presentations:

  ![Diagram](Image)

  *Not enough spacing: Hard to read
  *Contrast should be improved

  *Random (and bad) placement of text: Looks messy

**What’s wrong here?**

Presentations Are Very Important

- You present your work and yourself.
- People remember good presentations:

  ![Diagram](Image)

  *Too much text + only text
  *Conflicts with you talking (more later)
An effective talk is beautiful

Achieving beauty requires skill and effort

Which kind of talk do you want to give?

Technical Content

- **Communicate:**
  - Motivation
  - Problem statement
  - Main idea
  - Main result

- **Do not (try to) communicate:**
  - Every detail of your work

- **Why?**
  - Because people cannot digest much information that quickly
  - You are lucky if they remember anything from your talk

- **How to get across?**
Floor planning a 30 minute talk

**Intro:** “hook” them fast or laptops will open
- Place the work
- Show there’s a problem
- Hint at the solution

**Background:**
- Give context
- Explain concepts
- (some) prior work

**Navigation aids:**
- Title, outline, conclusions

**Present idea/solution:**
- Convince them it will work
- Key concepts only

**Experimental results:**
- Prove it worked
- Focus on implications

**Backup slides:**
- Extra results
- Aids for Q&A

**Too many slides = death. Be ruthless.**

Slide titles are prime real estate

- Space is limited. Get right to the point!
- Use slide content to prove your point
  - Graphs, figures, equations, etc.
  - Span multiple slides as needed
- Punch line underscores implications
  - Tell the audience why they should care
  - Lead audience into the next slide
- Common pitfall: put claim in punchline

**Bonus: helps build strong story line**

Know your audience

- Conference talk?
  - Transmit “the juice” of your talk
  - Convince them to read your paper
- Job talk or potential collaborator?
  - Tailor-made “story” is key
  - Prove your work is relevant to their interests
- Keynote?
  - General audience (avoid hairy details)
  - Open their eyes to broad trends and implications

Know Your Enemy
You can’t read and listen at the same time.

Every aspect of talk must reflect this one fact.

Designing a beautiful talk

• What is beauty?
• Architecture (= functionality)
• Craftsmanship (= sparkle)
  – Slides
  – Figures
  – Equations
  – Graphs
  – Tables

Good slides = self-propelled talk
Colors

Warm Colors Dominate, Cool Colors Recede
- That's why in text red works better than blue
- But for boxes it is the other way round
- For areas/boxes: try desaturated bright (= pastel) colors
- An outline in the same color, but darker, can look good
- But also dark boxes (again, desaturated) can make sense

Colors: Basics
- Use color
  - Pick a few colors and stick with them (consistency)

Avoid fully saturated
Choose somewhat desaturated

The Looks (The Design)
- As important as content
- Design includes
  - Basic layout
  - Fonts
  - Colors
  - Graphics
  - Data presentation: Viewgraphs, tables

- Basic layout
  - Keep it simple (don't clutter with logos etc.)
  - Be consistent
  - Black text on white background, or
  - Bright text on dark background
Fonts

- **Basics:**
  - Serif font: ergonomic for large text blocks (books)
  - Sans-serif: better readability for short text blocks
- Use a sans-serif font
  - *Powerpoint: use Calibri* (this talk)
  - Arial is less attractive
  - Arial Narrow is less attractive
  - For code: Courier bold is best
  - Don’t use this font for technical talks
- Use only one or two fonts and be consistent

Basic Tips

- Use Office 2007, it’s worth it
- Use Slide Master to set basic appearance
  - View → Slide Master
- Set “Snap objects to grid” simplifies placement
  - Home → Arrange → Align → Grid Settings
- Use ruler to align text with bullets
  - View → Ruler, then pull tab stops
  - Avoids things like
    - This is some text inside a bullet and badly aligned
- Shift-enter for line break without new bullet

Don’t just talk about it ....
... show it!

Visualization in Biology

- Complex process:
  Combinatorial signaling pathways involved in maintaining mouse ESC pluripotency.

How to Present a Viewgraph: Example

- Start like this:
  - We compare the performance of Spiral and IPP
  - The x-axis shows ...., the y-axis shows
  - This means higher is better (or vice-versa)
  - For example, this datapoint means that ....

- Now you can explain more
- Then conclude
  - But this plot is rather mediocre ...
Example I: Good Viewgraph

Graphs should aid interpretation

Example II: Good Viewgraph

Use log log-scale:
- when range spans 2+ orders of magnitude
- to highlight ratios instead of differences

Y-axis intercept:
0 (1 if log-scale)

Use scatterplot if x axis is numeric... especially when samples are unevenly spaced
### Which One Looks Better?

<table>
<thead>
<tr>
<th>Concept</th>
<th>Abstract Concept</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Euler</td>
<td>$\Delta x = \Delta z \cdot \Delta y$</td>
<td>$\Delta x = \Delta z \cdot \Delta y$</td>
</tr>
<tr>
<td>Integrator</td>
<td>$x = \int \Delta z \cdot \Delta y$</td>
<td>$x = \int \Delta z \cdot \Delta y$</td>
</tr>
<tr>
<td>Step function</td>
<td>$y = \begin{cases} 0 &amp; \text{if } x &lt; 0 \ x &amp; \text{if } x \geq 0 \end{cases}$</td>
<td>$y = \begin{cases} 0 &amp; \text{if } x &lt; 0 \ x &amp; \text{if } x \geq 0 \end{cases}$</td>
</tr>
<tr>
<td>Fourier transform</td>
<td>$\Delta x = \Delta z \cdot \Delta y$</td>
<td>$\Delta x = \Delta z \cdot \Delta y$</td>
</tr>
<tr>
<td>Frequency response</td>
<td>$y = \omega = \omega_0 + \omega_0$</td>
<td>$y = \omega = \omega_0 + \omega_0$</td>
</tr>
</tbody>
</table>

Easy decision, isn't it?

### Most Important Guidelines for Making Tables

- Avoid vertical lines
- Avoid "boxing up" cells, usually 3 horizontal lines are enough: above, below, and after heading (see examples in this guide)
- Avoid double horizontal lines
- Enough space between rows
- If in doubt, align left

### Example: Before and After

**Before:**

<table>
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</tbody>
</table>

**After:**

- More space between rows
- Space to the left edge removed
- Space to the right edge removed
- Also the first column gets a header
- Everything left aligned
- Three horizontal lines only, I like the top and bottom ones bolded

### Example Tables

**Price of Privilege**

<table>
<thead>
<tr>
<th>Market</th>
<th>1Q 2004-6T 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>1103 (61,541)</td>
</tr>
<tr>
<td>Japan</td>
<td>933 (35,944)</td>
</tr>
<tr>
<td>UK</td>
<td>1425 (64,103)</td>
</tr>
<tr>
<td>Germany</td>
<td>1399 (64,103)</td>
</tr>
<tr>
<td>France</td>
<td>1215 (64,103)</td>
</tr>
<tr>
<td>Sweden</td>
<td>906 (35,944)</td>
</tr>
</tbody>
</table>

**Not enough**

<table>
<thead>
<tr>
<th>Country</th>
<th>% of German newspaper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britain</td>
<td>35.9</td>
</tr>
</tbody>
</table>

**World**

<table>
<thead>
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<th>Market</th>
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</tbody>
</table>

Sources: Nielsen, AGB, und ProFILES.
### Equations can be deadly

Work sharing performance model:

\[ x(M,n) = \min \left( \frac{1}{\max_i \sum_{n \geq 0} p_i + \sum_{n \geq M} p_{n-M}} \right) \]

Barrage of symbols and terms

No time for proper explanation

Masks big picture

Performance depends on two factors:

\[ \text{Throughput} = f \left( \frac{1}{\text{Total Work}} \cdot \frac{1}{\text{Critical Path}} \right) \]

All terms useful and understandable

Presentation highlights point

Improved by work sharing

Worsened by work sharing

Be nice to your audience: parsimony is key

### Principles for a beautiful talk

- **Presenting well is *very* important**
  - Only one chance to make a first impression
  - Gives you a real edge over all those bad presentations

- **Understand the enemy**
  - Bored audiences tune out
  - Overloaded audiences tune out
  - Excessive text/detail = overloaded and bored audience

- ** Parsimony:**
  - Everything in the talk drives some point
  - Eliminate extraneous details

### Acknowledgments

- Slides with red backgrounds © Markus Püschel
  - His guides have vastly improved my talks
  - [Small guide to giving presentations](http://www.ece.cmu.edu/~pueschel/teaching/guides/guide-presentations.pdf)
  - [Small guide to designing tables](http://www.ece.cmu.edu/~pueschel/teaching/guides/guide-tables.pdf)
  - I have modified slightly some of his slides

- Natassa Ailamaki
  - Taught me what to (and not to) put in a talk
  - Taught me to put claims at the top of the slide

- CMU CALCM lab
  - Masters of the powerful intro
  - Patiently shredded my talks until I learned to do them right

### Books That Influenced This Talk

- Cliff Atkinson, *Beyond Bullet Points*, Microsoft Press, 2005
- Stephen Few, *Show Me the Numbers*, Analytics Press, 2004