Learning to Give an Excellent IW Talk

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Why This Title?
Why This Title?

There have been previous talks on this subject:

- How to give a great research talk, Ju
- How to give a good talk, Fleet and Hertzmann
- How to give a good research talk, Jones et al.
- How to give a good research talk, Zeller
- How to give a good research talk, Scott
- Give a good research talk, Xu
- How to give good presentations, Carlton & Jacob
- How to give a bad talk, Paterson
Why This Title?

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- Give a good research talk, Xu
- How to give good presentations, Carlton & Jacob
- How to give a bad talk, Paterson

At Princeton, we strive for EXCELLENCE! (why settle for just “good” or “great”?)
Motivation

Giving excellent technical talks helps you …

- Communicate your ideas to others
- Get useful feedback to guide your next steps
- Encourage people to learn more about your work
- Garner interest in your ideas

Giving excellent talks is one of the core skills to learn as a student
Goal of this Information Session

Teach you how to design excellent technical talks

- Stimulate critical thinking about talk design
- Enhance awareness of common pitfalls
- Provide concrete guidance for your upcoming talk

Main takeaway: guidelines for designing excellent talks
Plan for this Information Session

Part 1: Discuss basic principles of slide design
- Colors, fonts, text, figures, animations, etc.
- Layouts, context, consistency, etc.

Part 2: Provide a roadmap for how to organize a talk
- Suggest a particular flow of ideas
- Explain why that flow of ideas is good
- Discuss alternatives

Part 3: Suggestions for the Presentation
- Understand your audience
- How to speak
- Practice
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- Practice
Part 1: Slide Design

Basic principles of slide design

- Colors
- Fonts
- Text
- Equations
- Figures
- Animations
- Layout
- Context
- Consistency
- etc.
Part 1: Slide Design

Basic principles of slide design

- Colors
  - Fonts
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  - Layout
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  - etc.
Part 1: Slide Design

Basic principles of slide design

- Colors
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  - Layout
  - Context
  - Consistency
  - etc.

Choose colors carefully (what you see on your laptop is not what your audience sees)
Part 1: Slide Design

Basic principles of slide design

- Colors
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- Text
- Equations
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- Consistency
- etc.

Popular Sorts
- Insertion Sort
- Merge Sort
- Heap Sort
- Quicksort

Don’t do this
Part 1: Slide Design

Basic principles of slide design

- **Colors**
  - Fonts
  - Text
  - Equations
  - Figures
  - Animations
  - Layout
  - Context
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  - etc.

---

Popular Sorts

- Insertion Sort
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Don’t do this
Part 1: Slide Design

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Do this
Part 1: Slide Design

Basic principles of slide design

- Colors
  - Fonts
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  - Figures
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  - Layout
  - Context
  - Consistency
  - etc.

It is a common mistake to highlight a word by using a light color on a light or white background.

Don’t do this
Part 1: Slide Design

Basic principles of slide design

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- Layout
- Context
- Consistency
- etc.
Part 1: Slide Design

Basic principles of slide design

- Colors
- Fonts
- Text
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- Consistency
- etc.

28pt: Arial, Cambria, Times, Courier, Monotype
24pt: Arial, Cambria, Times, Courier, Monotype
22pt: Arial, Cambria, Times, Courier, Monotype
20pt: Arial, Cambria, Times, Courier, Monotype
18pt: Arial, Cambria, Times, Courier, Monotype
16pt: Arial, Cambria, Times, Courier, Monotype
14pt: Arial, Cambria, Times, Courier, Monotype
12pt: Arial, Cambria, Times, Courier, Monotype

Choose fonts that are easiest to read
Part 1: Slide Design

Basic principles of slide design

- Colors
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- Context
- Consistency
- etc.

Slide Cosmetics

- Include graphics! And not the cheap Microsoft graphics – spend some time looking for good ones. Your colleagues’ great slides, Google Images...
- Make the text as big as possible so that it fits but looks ridiculous maybe…then back off a bit. 18 pt or greater. Times Roman font doesn’t look good on slides.
- All figures should have axes labeled, lines identified, variables defined, source acknowledged. If showing comparison of model results to research observations, make sure to mention who took the measurements especially if they are in the audience (duh!).
- Use a plain background to avoid distracting the audience and allow more room for content. Avoid cheesy templates.
- Animation schemes, successive uncovering of text may be effective but don’t overdo it – audience may resent the game of cat and mouse, and it makes your slides less handy for others to use. Avoid distracting your audience with needless animation schemes.
- Consider showing a short movie if your topic warrants it — everyone likes movies. A bit of blackboard work in the middle can also be an effective break — but make sure you know what you’re doing.
Part 1: Slide Design

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- etc.

### Bad Decisions Regarding Fonts

<table>
<thead>
<tr>
<th>Small text (18pt font)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTIRE SENTENCES IN ALL CAPS</td>
</tr>
<tr>
<td>Entire sentences of bold text</td>
</tr>
<tr>
<td>Serif fonts (e.g., Times New Roman)</td>
</tr>
</tbody>
</table>

Don’t do any of this
Part 1: Slide Design

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- etc.

24pt fonts or larger (depending on size of room)

Sans serif fonts

- Arial
- Helvetica
- Tahoma
- Verdana

Do this
Part 1: Slide Design

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- etc.
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Popular Sorts

- **Insertion sort** is a simple sorting algorithm that is relatively efficient for small lists and mostly sorted lists, and is often used as part of more sophisticated algorithms. It works by taking elements from the list one by one and inserting them in their correct position into a new sorted list.

- **Heapsort** is a much more efficient version of selection sort. It also works by determining the largest (or smallest) element of the list, placing that at the end (or beginning) of the list, then continuing with the rest of the list, but accomplishes this task efficiently by using a data structure called a heap, a special type of binary tree.[25] Once the data list has been made into a heap, the root node is guaranteed to be the largest (or smallest) element. When it is removed and placed at the end of the list, the heap is rearranged so the largest element remaining moves to the root.

- **Merge sort** takes advantage of the ease of merging already sorted lists into a new sorted list. It starts by comparing every two elements (i.e., 1 with 2, then 3 with 4...) and swapping them if the first should come after the second. It then merges each of the resulting lists of two into lists of four, then merges those lists of four, and so on; until at last two lists are merged into the final sorted list.

- **Quicksort** is a divide and conquer algorithm which relies on a partition operation: to partition an array an element called a pivot is selected. All elements smaller than the pivot are moved before it and all greater elements are moved after it. This can be done efficiently in linear time and in-place. The lesser and greater sublists are then recursively sorted.

Don’t do this
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Don’t do this
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One message per slide

- Only short sentences or phrases
- Enough text to follow the story
- Not all the details

Do this
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EXAMPLE 1 CONT.

\[
\begin{align*}
  u_1(x,t) &= \left[ t - \frac{2t^2}{15} - \frac{t^3}{63} \frac{\Gamma(3-\alpha)}{\Gamma(5-\alpha)} \right] \frac{\Gamma(5-\alpha)}{\Gamma(3-\alpha)}, \\
  u_2(x,t) &= \left[ -\frac{t^3}{3} + \frac{2t^5}{15} + \frac{t^7}{45} + \frac{2t^9}{567} + \frac{4t^{11}}{2475} - \frac{2t^{12}}{12285} - \frac{4t^{13}}{59535} - \frac{2t^{2-\alpha}}{\Gamma(3-\alpha)} \\
        &+ \frac{t^{3-2\alpha}}{\Gamma(4-2\alpha)} + \left( \frac{2}{\Gamma(3-\alpha)} - \frac{2}{\Gamma(4-\alpha)} \right) \frac{t^{4-\alpha}}{(4-\alpha)} \\
        &+ \left( \frac{4}{\Gamma(5-\alpha)} + \frac{16}{\Gamma(6-\alpha)} \right) \frac{t^{6-\alpha}}{(6-\alpha)} \\
        &+ \left( \frac{80}{\Gamma(8-\alpha)} + \frac{4}{\Gamma(7-\alpha)} \right) \frac{t^{8-\alpha}}{(8-\alpha)} \\
        &- \left( \frac{8}{15\Gamma(5-\alpha)} + \frac{2}{63\Gamma(3-\alpha)} \right) \frac{t^{10-\alpha}}{(10-\alpha)} - \frac{4t^{12-\alpha}}{63(12-\alpha)\Gamma(5-\alpha)} \\
        &+ \left( \frac{2}{\Gamma(5-2\alpha)} - \frac{1}{\Gamma(3-\alpha)^2} \right) \frac{t^{5-2\alpha}}{5-2\alpha} - \frac{4t^{7-2\alpha}}{(7-2\alpha)\Gamma(3-\alpha)\Gamma(5-\alpha)} \\
        &- \frac{4t^{9-2\alpha}}{(9-2\alpha)\Gamma(5-\alpha)^2} \right].
\end{align*}
\]

Don’t do this

(Unless you plan to define every variable and step through every equation)
Part 1: Slide Design

Basic principles of slide design

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Matching Local Shapes

1. Generate local shape features
2. Find correspondences minimizing distance function

$$D(A, B) = \sum_{Correspondences} \Delta FeatureShape + \sum_{Correspondence Pairs} \Delta SpatialConsistency$$

Do this
(Only include equations that help tell your story)
Part 1: Slide Design

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- etc.
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Approach

- The problem is: traditional methods are either a) too expensive, b) not readily available or c) make it hard to gauge progress
- Key idea: combine the freedom of self learning with the feedback of a coach by use a Kinect camera to facilitate practice
- Select a number of key positions and steps that users can pick up
- Use skeletal tracking capabilities of Kinect to calculate how well user is recreating these steps compared to a ground truth model
- Integrate instruction with high fidelity
- Use a game-like format to track progress, and create a sense of competition
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Big-O Complexity

Don’t do this
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![Plot Title](image)
Part 1: Slide Design

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- etc.

Or even better, this
Part 1: Slide Design

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- Layout
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- Consistency
- etc.
Part 1: Slide Design

Basic principles of slide design

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Don’t do this
Part 1: Slide Design

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- Layout
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- etc.

Do this (animated visualization)

http://www.pptalchemy.co.uk/
Part 1: Slide Design

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- Animations
- Layout
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- etc.

Do this (demonstration)
Part 1: Slide Design

Basic principles of slide design

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- Fonts
- Text
- Equations
- Figures
- Animations
- **Layout**
- Context
- Consistency
- etc.
Part 1: Slide Design

Basic principles of slide design

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- Fonts
- Text
- Equations
- Figures
- Animations
- Layout
- Context
- Consistency
- etc.

Try to have main point of slide across top, supporting points in bullets, and a figure filling most of the slide.
Part 1: Slide Design

Basic principles of slide design

- Colors
- Fonts
- Text
- Equations
- Figures
- Animations

- Layout
- Context
- Consistency
- etc.

Try to have main point of slide across top, supporting points in bullets, and a figure filling most of the slide.
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- etc.

Symmetry Axis Alignment

$O(mn)$ algorithm based on dynamic programming

- Dynamic time warping [Marzal et al., 2005]

Input:

```
X Y Y X X
Y X X Y
```

Solution:

```
X Y Y X X
Y X X Y
```

Edit graph:

```
X Y X Y
Y X X Y
```

Try to have main point of slide across top, supporting points in bullets, and a figure filling most of the slide.
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Timing

Computational complexity:
- $O(F^6S\log M + N^3 + NFS\log M)$
  - $F = \#$ feature points (~5-10)
  - $S = \#$ sample points on mesh (128)
  - $M = \#$ vertices on mesh (~10K)
  - $N = \#$ sample points on axis curve (200)

Computation time, in practice:
- ~1 min for symmetry axis detection (once per mesh)
- ~5 sec for symmetry axis alignment
- ~3 min for correspondence extrapolation

Rarely two points per slide
Rarely three levels
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Part of Talk

Topic sentence

Do this
Part 1: Slide Design

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Sorting Summary

- Insertion Sort
  - Best case – N
  - Worst case – N^2
- Mergesort
  - Best case - NlogN
  - Worst case – N Log N
- Quick sort
  - Best case – n log n
  - Worst Case – n^2

Don’t do this
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Don’t do this
Part 1: Slide Design

Bonus Fact

- Easy to read slides lower the probability of critical examination!
  - *Thinking Fast and Slow* – D. Kahneman

Main takeaway: Are your slides easy to read?
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Part 3: Suggestions for the presentation
  - Understand your audience
  - How to speak
  - Practice
Part 2: Flow of Ideas

Goal: organize your talk with a flow of ideas that …

- Makes a point
- Teaches the listener something they remember
- Tells a story
Part 2: Flow of Ideas

Goal: organize your talk with a flow of ideas that …

- Makes a point
- Teaches the listener something they remember
- Tells a story with a logical flow of ideas

Flow of Ideas

- Each idea should follow directly from previous one
- Details should be omitted unless necessary for story
  - Level of detail should be tailored to audience
Part 2: Flow of Ideas

A flow that works for almost any talk:

- Motivation
- Goal
- Related work
- Approach
- Implementation
- Evaluation/Results
- Conclusions
- Future work
- Acknowledgments
Part 2: Flow of Ideas

A flow that works for almost any talk:

- Motivation
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  - Approach
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  - Conclusions
  - Future work
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Motivation:
Establish importance of your area or topic
Part 2: Flow of Ideas

A flow that works for almost any talk:

- Motivation
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**Goal:**
Define desired end-state:
- Specify inputs and outputs
- Define assumptions
- Describe desirable properties
- Provide concrete example(s)
Part 2: Flow of Ideas

A flow that works for almost any talk:

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**Related work:**

Provide taxonomy of previous approaches to achieve your goal.

For each one, briefly describe the key idea and explain why it doesn’t achieve your goal completely.
Part 2: Flow of Ideas

A flow that works for almost any talk:

- Motivation
- Goal
- Related work
- **Approach**
  - Implementation
  - Evaluation/Results
  - Conclusions
  - Future work
  - Acknowledgments

**Approach:**

- Present novel idea (Eureka!)
- Explain why it is a good idea (describe rationale)
- Provide simple example showing how your idea achieves your goal in situation where previous approaches would not
Part 2: Flow of Ideas

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**Implementation: What you did**

Provide overview:
- System organization
- Sequence of steps (flow chart)

For most important steps (or issues):
- Challenge
- Approach
- Implementation
- Results
Part 2: Flow of Ideas

A flow that works for almost any talk:

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Evaluation/Results:

Present results of evaluation aimed at testing whether met goal.

For each evaluation:

- State goal of evaluation
- Describe evaluation setup
- Describe evaluation metric(s)
- Present results
- Discuss success/failure cases
- Explain implications
Part 2: Flow of Ideas

A flow that works for almost any talk:

- Motivation
- Goal
- Related work
- Approach
- Implementation
- Evaluation/Results

Conclusions:
- Summarize key points
- Restate main results
- Describe implications

Future work
Acknowledgments
Part 2: Flow of Ideas

A flow that works for almost any talk:

- Motivation
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- Related work
- Approach
- Implementation
- Evaluation/Results
- Conclusions

Future work:
- This semester: remaining steps, pending evaluations, etc.
- Next projects: questions to investigate in a follow-up study
- Long-term: how work could affect direction of your field 😊
Part 2: Flow of Ideas

A flow that works for almost any talk:

- Motivation
- Goal
- Related work
- Approach
- Implementation
- Evaluation/Results
- Conclusions
- Future work

Acknowledgments:

Sources of code, data, etc.
Student collaborators
Faculty advisor
Funding
etc.
Part 2: Flow of Ideas

Alternatives:

Sure, but if you are reinventing the wheel, it better be good!

Example: Results first followed by how you got there.

\[ E=mc^2 \]
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Part 3: Suggestions for the presentation
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Part 3: You Are the Expert!

No one knows what you know:
- But your audience is eager to know what you know

Your Job:
- Create the structure of knowledge in your audience’s mind that you already have in yours

How you do it:
- Tell them a story that builds, one layer at a time, the edifice of knowledge that you want to create

The Result:
- The audience is happy because it learned something
Part 3: The Curse of Knowledge

No one knows what you know:

- Unfortunately, we forget what it feels like to not know something we know well

Vocabulary:

- Does your audience know the acronyms, jargon, and terms of art that you are using?

Structure your sentences:

- Link sentences with structural clues like “Although,” “An example is,” “Because,” “This shows,” etc. to enable your audience to follow your logic.
Part 3: How to speak

Establish your presence:
- Introduce yourself and your topic

Do not whisper or shout:
- You need to reach the person in the last seat, but not beyond – in video, watch your audio levels

Control the verbal tics:
- Umms, uhs, sniffles, grunts, etc.

Pace yourself:
- Speak conversationally, neither too fast or slow
Part 3: How to speak

For video presentations (interviews too!):

- If the audience sees you, fill the screen
- If they don’t see you, try to go a little slower
- Pause for and elicit questions if live
- If recorded, go slow, and repeat yourself
  - With recording, you can re-record, to polish your presentation
How to Record Oral Presentation

Pre-recorded via Zoom (using a laptop/desktop)

Settings: Before you start your recording, we recommend that you check to make sure your settings are set to record to the cloud.

- Visit Princeton.zoom.us
- Click “sign in” and use your NetID and Password to login.
- Click “Settings” in the side-bar.
- Click “Recording” toward the top of the page.
- Enable cloud recording toward the top of the page.
Another setting we recommend is:

- Record thumbnails when sharing: Include a thumbnail video of the presenter when the recording includes a shared screen.

Advanced cloud recording settings

- Add a timestamp to the recording
- Display participants' names in the recording
- Record thumbnails when sharing
- Optimize the recording for 3rd party video editor
- Audio transcript
- Save panelist chat to the recording
How to Record Oral Presentation con’t

Recording

- Have Oral presentation slides open and easily accessible on your screen.
- Click on Meetings in the side-bar.
- Click on Personal Room toward the top of the page.
- Click the blue start button at the bottom of the page.
How to Record Oral Presentation con’t

- Once you are in your meeting room, click “Share Screen,” in the Zoom toolbar.
- If you have multiple screens, share the screen with your oral presentation slides open.
- If using PowerPoint, consider using presentation mode. If not, open your slides to full screen.
- Once you are ready to begin your recording, click “Record,” in the Zoom toolbar.
How to Record Oral Presentation cont’d

• Remember that you can always pause your recording if you need time in between slides to take a break or to review what’s coming up next
• When you are done recording, click “stop,” in the Zoom toolbar.
How to Submit Your Slides:

- In PowerPoint format or Keynote format, label your presentation as “firstname_lastname”. Any additional files needed, label the same - “firstname_lastname”
- Create a zip file named "oral_presentation.zip" this should have all the files from previous step.
- Login to the IW Portal and submit the ZIP file as oral_presentation.zip, in "Oral Presentation Slides" by 11:59pm on the deadline day.
- In the IW Portal: Click on “submit file” next to “Oral Presentation Slides”
How to Submit Slides con’t

A new screen will appear. Click “Browse” to locate your oral presentation slides on your computer. Select the file and upload. Don’t forget to click the “submit” button.
How to Submit Recorded Oral Presentation

- All you need to submit the recording of your talk is a link to where the recording is being hosted. If you recorded your video to cloud in Zoom, you will have access to a sharable link. If you uploaded your video to Google Drive, you should also have access to create a sharable link.

- In the IW portal: Click on “click to complete form” next to “Oral Presentation Video Link.”
How to Submit Recorded Oral Presentation  Con’t

A new screen will appear with a text box for you to enter the shared link to your recorded IW talk. Enter the link then click the “submit” button.

- Email a ZIP file with your slides and the link to your video-recorded talk to your adviser.
Part 3: Practice, Practice, Practice

Your slides can be improved:
- Share your slides with others and ask for suggestions

Your first talk shouldn’t be your final talk:
- Rehearse with a private audience

Ask your practice audience questions:
- Did it make sense?
- Was anything confusing?

Building confidence:
- More repetition leads to talk becoming easier to give
Part 3: Final Thoughts

Giving a talk is an opportunity
- Your chance to describe why what you did is cool!
- Your chance to convince others you are competent
- Why waste that opportunity by giving a bad talk?

Giving a talk does not have to be nerve-wracking
- You know more about topic than your audience
- Preparation and practice is very calming

ATTITUDE AND BODY LANGUAGE

- Look your audience in the eyes – don’t look at your slides (you shouldn’t need to). And don’t just look at the big shots – scan the room.
- Smile – it relaxes the audience. A bit of humor is always appreciated.
- Don’t be a statue. But don’t flail your arms aimlessly either. Don’t make the laser pointer dance on the screen.
- Some people like to ask questions during the talk, and sometimes that’s expected – but make sure these questions don’t compromise your ability to finish your talk in due time. If they do, be polite but firm about moving on.
- Take some time before the talk to set up, test your slides. Stay cool if equipment malfunctions – it’s not your fault. If it happens, politely ask the chair or your host to deal with it – no one expects you to fix a bulb, or a mike, or a light, etc. And then go on anyway if you possibly can – your audience will sympathize and admire you for doing the best possible under lousy circumstances.
Summary

Slide design is important
- Colors, fonts, text, figures, animations, etc.
- Layouts, context, consistency, etc.

Probably best to follow suggested flow of ideas
- Motivation, goal, previous work, approach, implementation, results, conclusion, future work
- Same flow used by most top people in the world

Designing effective talks is hard, but important
- Most people are not good at it, mostly because they don’t think about the choices they are making
- You are now above the median in knowledge on this subject 😊
Acknowledgments

Thanks to IW coordinators (past and present) for slides and advice:

- Tom Funkhouser, Alan Kaplan, Andrea LaPaugh

Thanks to IW admins: Colleen Kenny, Mikki Hornstein, Laura Cerrito

Thanks to the following people for ideas:

- Ju, Fleet & Hertzmann, Jones et al., Zeller, Scott, Xu, Carlton & Jacob, Paterson, Fatahalian

Thank You!