

CS197 Harvard: AI Research Experiences

Fall 2022: Lectures 20 – “Bejeweled”
Tips for Creating High-Quality Slides

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Abstract

In this lecture, we will delve into tools for creating effective slides for talks. I will share the assertion-evidence approach, an approach which focuses on building your talk around clear messages, rather than broad topics, and supporting these messages with visual evidence rather than long blocks of text. We will discuss common pitfalls, which tends to include too much text, cluttered slides, and poor design. We will explore strategies for avoiding these pitfalls and for crafting slides that are focused on the key messages of your talk and supported by relevant and impactful visuals. We will use real-examples of research talk slides to illustrate ways to improve their effectiveness. By the end of this lecture, you will have the skills and knowledge needed to create professional, engaging slide presentations that effectively convey your message using the assertion-evidence approach.



StableDiffusion2.1 Generation: “Making a pot in style of cubism”

Learning outcomes:

- Apply key principles of the assertion-evidence approach for creating effective slides for talks.
- Identify common pitfalls in typical slide presentations and strategies for avoiding them.
- Apply the techniques learned in this lecture to real-world examples of research talk slides to improve their effectiveness.

Assertion Evidence Approach

How do you make effective slides? I use the [assertion-evidence](#) approach for slides. The key ideas behind assertion-evidence are to:

- (1) build your talks on messages, not topics,
- (2) support messages with visual evidence, rather than long text, and
- (3) explain this evidence by fashioning words on the spot.

The assertion-evidence approach leads to [better comprehension and deeper understanding by the audience](#).

The assertion-evidence approach differs from a typical slideshow by prioritizing key messages in the title and relevant visuals in the body, rather than relying on cluttered slides with small graphics and excessive text. It is important to carefully choose visuals that support the message and avoid those that might be distracting or irrelevant.

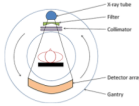
Here are some examples of typical slides (left), and how they have been changed into an assertion evidence framework (middle) with a supporting script on the right.

Example 1

Script: *"A CT (computed tomography) scanner is a specialized medical imaging device that uses x-ray technology to create detailed 3D images of the inside of the body. The CT machine consists of a large, donut-shaped x-ray machine that rotates around the body while the patient lies on a table that slides into the center of the machine. As the machine rotates, it emits a beam of x-rays through the body, which is then detected by detectors on the other side of the body. The data collected by the detectors is then used to create a 3D image of the inside of the body."*

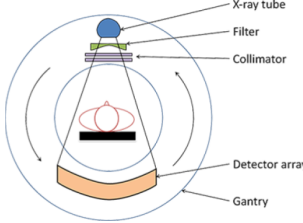
How does a CT Scanner Work

- CT scanner is a specialized medical imaging device
- Uses x-ray technology to create detailed 3D images of the inside of the body
- CT machine consists of a large, donut-shaped x-ray machine that rotates around the body
- Patient lies on a table that slides into the center of the machine
- X-ray beam is emitted through the body and detected by detectors on the other side
- Data collected by detectors is used to create a 3D image of the inside of the body



Bad ❌

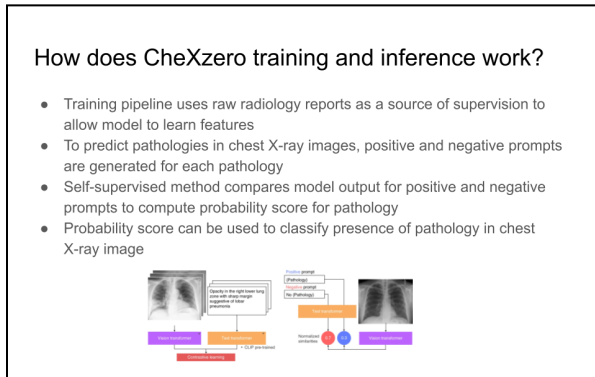
A CT scanner is a medical device that uses x-ray technology to create 3D images of the inside of the body.



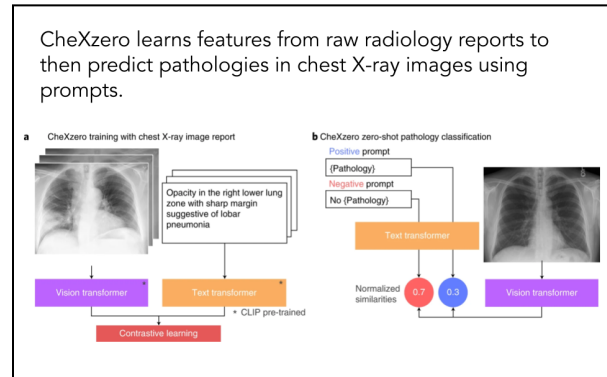
Good ✅

Example 2

Script: "First, the CheXzero training pipeline involves using raw radiology reports as a natural source of supervision, allowing the model to learn features from them. Then, to predict pathologies in a chest X-ray image, we generated a positive and negative prompt for each pathology, such as 'consolidation' versus 'no consolidation'. By comparing the model output for the positive and negative prompts, the self-supervised method can compute a probability score for the pathology, which can then be used to classify its presence in the chest X-ray image."



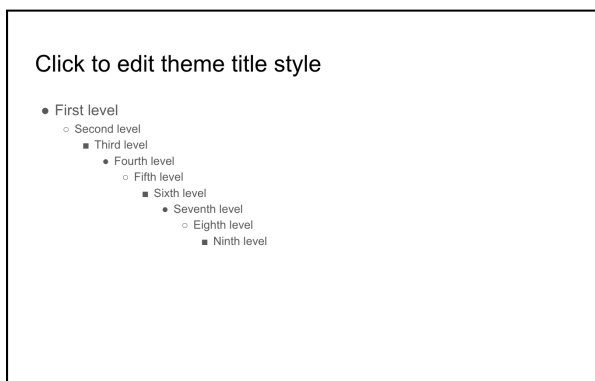
Bad ❌



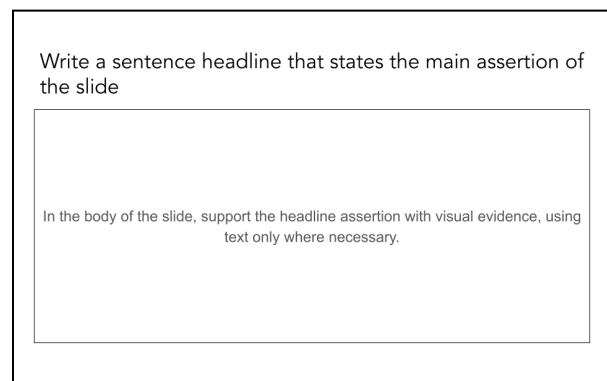
Good ✅

Default Difference

Compare the default setting of a slide vs assertion-evidence default.



Bad ❌



Good ✅

Make Texts Telegraphic

Telegraphic language is a style of writing or speaking that uses a minimum of words to convey meaning. It is often used in situations where time or space is limited, such as in telegrams,

headlines, or emergency announcements. In telegraphic language, only the most essential words are used, and words that can be inferred from context are left out. For example, instead of saying "The cat that was sleeping on the windowsill woke up and ran away," a telegraphic version might be "Cat wake, run."

Telegraphic language can be useful for conveying information quickly and efficiently, but it can also be difficult to understand if the context is not clear. In order to convey meaning effectively in telegraphic language, it is important to use clear, concise words and to provide enough context for the reader or listener to understand the message.

When you need to use text to support visuals, keep it [telegraphic](#). Use terse phrases rather than full sentences to minimize text the audience needs to read. The focus should be on you.

Strategies for Ensuring Effective Communication

- Use language that is easy to understand and avoids unnecessary jargon or technical terms
- Provide enough context so that the message can be understood without any additional information
- Consider the tone and level of formality that is appropriate for the audience and the situation
- Encourage two-way communication by actively listening to others and asking questions to clarify any misunderstandings
- Be aware of nonverbal cues and body language, as they can also convey important information and influence the way a message is received.

Bad ❌

Effective Communication strategies

Clear, simple language, no jargon

Adequate context

Appropriate tone, formality

Two-way comm., active listening, questions

Nonverbal cues, body language

Good ✅

Introduce Texts Sequentially

Second, introducing text sequentially rather than all at once. This makes reading or paraphrasing the slide to the audience more effective as the audience knows what point you are referring to. Comment fully on each line of text before moving on to the next one.

Effective Communication strategies

Clear, simple language, no jargon

Build-up 1

Effective Communication strategies

Clear, simple language, no jargon

Adequate context

Build-up 2

Effective Communication strategies

Clear, simple language, no jargon

Adequate context

Appropriate tone, formality

Build-up 3

Miscellaneous Tips for Texts

Use serif and sans-serif fonts together.

Serif and sans-serif fonts are often used together in design because they can provide a sense of hierarchy and balance to a layout. Serif fonts are characterized by small lines or decorative flourishes on the ends of the letters, while sans-serif fonts do not have these embellishments.

Serif fonts are typically used for body text because they are easier to read in large blocks of text due to the extra details on the letters. Sans-serif fonts are often used for headings and other large blocks of text because they are simpler and more modern-looking.

Using a combination of serif and sans-serif fonts can help to create a visual hierarchy in a layout, with the serif font used for the main body text and the sans-serif font used for headings and other prominent elements. This can make it easier for the reader to navigate the content and understand its structure.

In addition, using a combination of serif and sans-serif fonts can also add visual interest and contrast to a design, helping to break up the monotony of using only one type of font.

Use a white background.

There are a few reasons why a white background is often used for slides and why using two colors for slide text can be effective:

- Visibility: A white background can help to make the text on the slide more visible and easier to read, especially if the text is in a dark color. This is because the contrast between the white background and the dark text makes the text stand out more.
- Professional appearance: A white background is generally considered to be neutral and professional-looking, which can help to convey a sense of credibility and authority.
- Simplicity: A white background can also help to keep the focus on the content of the slide, rather than being distracted by busy or colorful backgrounds.

Use two colors in your slide text.

Using two colors for slide text can be effective because it can help to create a visual hierarchy and emphasize important points. For example, you could use a primary color for the main points and black for secondary points or supporting details. This can make it easier for the audience to follow the content and understand the structure of the presentation.

Use your slide footer for citations and page numbers

Including citations in the slide footer can be a helpful way to provide credit to the sources of your information and show that your presentation is based on credible research. To do this, you can use the slide footer feature in your presentation software to add a text box or field where you can include the citations for any sources you have used. This could include the author, title, and publication information for articles, books, or other resources.

Including the page number in the slide footer can also be useful for the audience, as it allows them to easily mark the page and ask questions about specific information during the presentation. This can be especially helpful if the audience wants to refer back to a specific slide or source later. To include the page number in the slide footer, you can use the built-in page numbering feature in your presentation software. This will automatically update the page number as you add or remove slides, so you don't have to manually update it yourself.

Overall, using the slide footer to include citations and the page number can help to make your presentation more professional and organized, and can also make it easier for the audience to follow along and ask questions.

Have an outline slide

Having an outline slide at the beginning of a presentation can be very helpful for both the presenter and the audience. An outline slide provides a clear overview of the structure and content of the presentation, and can help the audience understand the main points and how they fit together. This can be especially useful if the presentation covers a lot of information or has a complex structure.

For the presenter, an outline slide can serve as a roadmap for the presentation, helping to keep the focus on the main points and keep the presentation organized and on track. It can also be helpful to refer back to the outline slide as needed to make sure you are covering all of the important points and staying within the allotted time.

Overall, an outline slide is an important tool for creating a clear and organized presentation that is easy for the audience to follow. It can help to ensure that the presentation is effective and communicates the key points effectively.

I have developed a [Template](#) I use for my talks.

One set of ideas to follow is the Assertion-Evidence framework

Key principles of the framework:

1. Build your talk on messages.
2. Support these messages with visual evidence.
3. Explain this evidence by fashioning words on the spot.

Garner, Joanna K., et al. "Assertion-evidence slides appear to lead to better comprehension and recall of more complex concepts." 2011 ASEE Annual Conference & Exposition. 2011.

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Exercise 1: Fix a slide: Find a slidedeck for a talk and update it with the principles you have learned today. Create a 1x2 table on google doc showing the old slide, the new slide, and notes on what you changed and why.

Example 1:

Learning outcomes

1. Identify the essential components that go into building a novel model.
2. Train novel models, including:
 - a. Manage experiment configurations using Hydra.
 - b. Log model checkpoints.
 - c. Manage and analyze experiment results using Google spreadsheet pivot tables.
 - d. Log metric values and images using Weights & Biases.
3. Develop a good understanding of the value of code quality, experiment reproducibility, and experiment automation.
4. Develop a preliminary understanding of other best practices to explore further.

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Bad ❌

Learning outcomes

Identify Essential Components	Train Novel Models	Focus on Experiment Reproducibility and Automation	Emphasize Modularity for Future Work
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Better ✅

Reasoning:

- Eliminated unnecessary points that can be iterated on by the speaker
- Created object representations of each concept with the key word bolded with the main idea

Example 2:

The dataset

- CheXpert; 224,316 chest X-rays for 65,240 patients. Validation set consists of 234 chest X-rays from 200 patients. The test set consists of 668 chest X-rays from 500 patients.
- Labeled for the presence of 14 observations (13 pathologies and an observation of "No Finding").
- Our work concerns 10 of the 14 observations. "Fracture" and "Pleural Other" not included because of low prevalence in test set. "Pneumonia" not included because it is a clinical (as opposed to a radiological) diagnosis; "No Finding" not included because not applicable to evaluating localization performance.

<https://stanfordmlgroup.github.io/competitions/chexpert/>

Bad ✗

CheXpert contains chest X-rays with pathology labels

CheXpert	# of chest X-Rays	# of patients
Training	~200k	~50k
Validation	~200	~200
Test	~500	~500

<https://stanfordmlgroup.github.io/competitions/chexpert/>

- Our work concerns 10 of the 14 observations (13 pathologies + 1 observe "No Finding")
 - "Fracture" and "Pleural Other" have low prevalence in test set
 - "Pneumonia" is a clinical diagnosis
 - "No Finding" is applicable to evaluating localization performance.

Better ✓

Reasoning:

- More descriptive title
- Less text
- Essential components extracted from figure with color
- Kept only orders of magnitude from the table

At-home exercise:

For one of the slide presentations, improve its organization. Make a suggestion for improvement, showing the outline for the previous version and new version side by side.

Conclusion

In this lecture, we explored various strategies for creating effective slide decks. One of the approaches discussed was the assertion-evidence approach, which involves organizing a presentation around specific, clear messages and supporting these messages with visual evidence. We looked at examples of this approach and discussed how to avoid common pitfalls, such as using too much text or cluttered slides. We also covered techniques for making text more concise and organized, including using telegraphic language and introducing text sequentially. In addition, we discussed the use of design elements such as serif and sans-serif fonts, a white background, and two colors in slide text to enhance the effectiveness of the slides. We also emphasized the importance of including citations and page numbers in the slide footer, and the value of having an outline slide at the beginning of the presentation. You can check out my google slides [Template](#) putting together these ideas.