MITOCW | mitres16-9960-figure_design_captions

[Morse code beeps] [Whoosh]

[Helicopter rotor]

Hi. My name is Annika Thomas, and I'm a fellow with the AeroAstro Communication Lab at MIT, and today we're going to be talking about figure design.

By the end of our lesson, you should be able to understand the purpose of figures in technical communication.

You will learn criteria for designing clear and effective figures, and you should be able to apply best practices to evaluate and improve a figure.

Some criteria for success for your figures is they should communicate a clear, one sentence, main message.

They provide evidence that directly supports that message.

They minimize visual noise that can distract from that message.

They should be easy to interpret without having additional explanation needed.

So what is the purpose of a figure?

Figures communicate a takeaway message.

The evidence that supports that message and the figures job is not just to show data, but also to show what you learned from it.

We're not just showing that quantitative data that you collected, we're also really encapsulating whatever that takeaway message is from the figure.

The first thing you should do is analyze the context of your figure.

This includes why does our figure exist?

What's the purpose of it?

Who is our intended audience for the figure?

Is it a more technical audience in a scientific paper, or maybe a more general audience in a presentation?

And where will that figure appear?

In what setting?

So figures look different in different settings.

Like I mentioned, in papers, we have self-contained figures and informative captions.

Posters have large readable figures that should be visible and interpretable from a distance, and slides in presentations have simplified figures that should be optimized for quick comprehension.

So you're going to want to decide what the correct figure type is for you, based on the circumstance in which you're sharing that information.

Text, tables, and figures all communicate information differently.

Figures can serve different purposes.

Photos give us realism and scale, understanding of experimental setups, and things that we can actually physically see and interpret.

Illustrations give us structure and function, and graphs provide us with trends, comparisons, and processes.

And on this slide, you'll see three different ways in which we can communicate the same information using different figure types including a table, text, and an actual figure on an X-Y chart.

So depending on the circumstance, we might choose one of these different figure types to communicate this information.

So a certain type of figure that we might be including is a plot.

And you want to choose the correct plot design as well.

So the plot type should match what you want to show with that figure.

Distributions are well shown by histograms and box plots.

Trends over time are most commonly shown using line plots.

Correlations can be shown using scatter plots, And you always want to plot your data before summarizing it.

An important concept in figure design is signal versus noise.

Signal is the message that you want the audience to see, while noise is anything that distracts from that message.

Some common sources of noise in figures include too much data in your figure, using poor plot choices, so selecting the wrong type of plot based on the the message that you want to communicate with your audience, and sometimes including excessive visual elements can distract from that main message.

And on this slide we have a good example of signal versus noise in a pie chart.

On the left side we have pretty small text a bunch of labels and kind of a wordy caption.

versus on the right side, we really streamline this pie chart into a key takeaway message.

Another important thing to think about while designing your figures is accessibility in figure design.

Your figures should be understandable to you all audience members.

Some best practices for this include don't rely on color alone in order to communicate a message, you should use high contrast and readable fonts.

And in addition to your figure caption, you should also include alt text to describe the figures.

Now we're going to go ahead and take these concepts into an actual figure that you're working on with an activity where you evaluate and revise a figure.

So go ahead and choose a figure that you are currently using or plan to use for a paper, poster, presentation, etc.

and answer the questions detailed in the activity.

[Alien spaceship beeps]

Now by the end of this lesson, you should be able to articulate the main message of a figure.

You should be able to evaluate a figures context, audience, and signal to noise ratio.

And you should be able to identify concrete changes that would improve clarity, accessibility, and interpretability of your figures.

Thanks for watching.

[Alien spaceship beeps]