Welcome to the introductory workshop for the MIT Research Slam / 3MT!

While we’re getting set up, review the rules for the 3-Minute Thesis* competition. To ask questions, raise your hand/use the chat.

- **A single static PowerPoint slide** is permitted. No slide transitions, animations or ‘movement’ of any description are allowed. The slide is to be presented from the beginning of the oration.
- **No additional electronic media** (e.g., sound and video files) are permitted.
- **No additional props** (e.g., costumes, musical instruments, laboratory equipment) are permitted.
- Presentations are limited to **3 minutes maximum**. Competitors exceeding 3 minutes are disqualified.
- Presentations are to be **spoken word** (e.g., no poems, raps, or songs).
- Presentations must be submitted as **pre-recorded videos** (with slide embedded as an image in top right corner) through by **March 11**: [bit.ly/3mt-mit-competition](https://bit.ly/3mt-mit-competition)
  - Finalists’ videos will be played during the **April 17 Showcase**, with commentary by judges.

* We’re calling it a Research Slam because we’re including postdocs, too.
Crafting a Compelling 3-Minute Talk

Dr. Jacqueline Goldstein,
Communication Lab Instructional Designer

Development Credit:
Dr. Jesse Dunietz
Dr. Diana Chien
MIT’s 4th Annual

sponsored by

MIT RESEARCH SLAM

FEATURING 3 MT THREE MINUTE THESIS

sponsored by

WCC at MIT

MIT SCHOOL OF ENGINEERING COMMUNICATION LAB

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Graduate Student Council of the Massachusetts Institute of Technology

External Affairs Board
MIT Comm Lab is a discipline-specific peer-coaching program that helps students and postdocs with their scientific writing, speaking, & visual design.

Make appointments and browse how-to docs at:

mitcommlab.edu ➔ Find Communication Labs
Dr. Jac Goldstein (she/her)

- Comm Lab Instructional Designer
- Astronomy PhD (minor Sci Comm)
- Co-creator SciCommBites
Let’s analyze a winning 3MT video together.

How would you summarize the main message of the presenter’s research in one sentence?

What did they say to get that message across?

What did they show to get that message across?
Let’s analyze a winning 3MT video together.

- How would you summarize the main message of the presenter’s research in one sentence?
- What did they say to get that message across?
- What did they show to get that message across?
By the end of this workshop, you will be able to...

1. Distill a **central message** from complex ideas about a research topic.

2. Structure an **story** that is memorable and engaging.

3. Sketch a **visually appealing slide** that supports your message & story.

Attend the next workshop:

**Deliver to Win: How to Present Your 3-Minute Talk Effectively:**

Wednesday, February 21st; 3:30-5 PM ET; to work on your presentation delivery!
1. Distill a **central message**

2. Structure a **memorable, exciting story**

3. Sketch a **visually appealing slide**
With only 3 minutes, you must focus your audience’s attention on a single take-home message.

What was Jennifer’s Main Message?

Gold wires can improve the sensitivity of tiny devices that may allow doctors to diagnose disease painlessly through the breath.
To distill a main message, first consider: Who are you communicating with?

- Politician
- Research slam audience
- Researcher in your field

Technical language

2/23/24

Courtesy Alison Takemura
To distill a main message, then consider: What **impact** do you want your message to have?  

<table>
<thead>
<tr>
<th>Impact</th>
<th>Politician</th>
<th>Research slam audience</th>
<th>Researcher in your field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure Funding</td>
<td>Provide inspiration.</td>
<td>Critique approach</td>
<td></td>
</tr>
<tr>
<td>Funding for nanocantilever research could yield painless medical tests.</td>
<td>Nanocantilevers are an example of how basic physics can lead to real life applications.</td>
<td>The variable resistance in gold wires makes them ideal in nanocantilevers to increase measurement sensitivity.</td>
<td></td>
</tr>
</tbody>
</table>

Courtesy Alison Takemura
You’ll be paired with a partner in a breakout room.
Partner 1 will practice saying their message in...
60 sec
30 sec
15 sec
8 sec
Write down your favorite versions.
Then it’s Partner 2’s turn!

1. Distill a central message

2. Structure a memorable, exciting story

3. Sketch a visually appealing slide
A story is how we make sense of the world.

1. **Empathic** - We can *relate* to characters or events

2. **Engaging** - We are *curious* how the tension resolves

3. **Understandable** - We can *follow* and *visualize* events

4. **Meaningful** - We are *changed* by resolution
One structure for a story is an **Hourglass**.

- **Establish significance:** A problem your audience cares about.
- **Describe the status quo:** What we currently know/do...
- **Identify a gap:** We need to know/do...
- **What did you do?** In order to know/do...
- **Fill the gap:** You found (or could find)... We now (or could) know/do...
- **Re-establish significance** The problem is (or could be) improved.

**There’s a problem that’s worthwhile to work on!**

**Your work is addressing the problem!**

Based on work by Scott Olesen (BE Communication Lab) & Carnegie Mellon U.’s Global Communication Center
The **Hourglass** is a way to outline your talk.

1. **Establish significance:** A problem your audience cares about.
   - Medical tests at the doctor can be painful for people.

2. **Describe the status quo:** What we currently know/do...
   - Devices can test for molecules through breath, but are large and expensive.

3. **Identify a gap:** We need to know/do...
   - Nanocantilevers are small, but need more sensitive measurements.

4. **What did you do?** In order to know/do...
   - To enable more sensitive measurements, she attached gold wires.

5. **Fill the gap:** You found (or could find)... We now (or could) know/do...
   - Bend in gold wires can be measured & allow for more sensitive measurements.

6. **Re-establish significance:** The problem is (or could be) improved.
   - More sensitive measurements could lead to painless medical tests.
Medical tests at the doctor could be painful for Jennifer (and people).

Devices can test for molecules through breath, but are large and expensive.

Nanocantilevers are small, but need more sensitive measurements.

To enable more sensitive measurements, she attached gold wires.

Bend in gold wires can be measured & allow for more sensitive measurements.

More sensitive measurements could lead to painless medical tests.
A research story can be about your process of discovery...

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>You, the researcher(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension</td>
<td>How will you solve the problem?</td>
</tr>
<tr>
<td>Events</td>
<td>Things you do, or that happen to you, as you solve the problem.</td>
</tr>
<tr>
<td>Resolution</td>
<td>Your research solves the problem!</td>
</tr>
</tbody>
</table>
...or a research story can be about your impact on humanity...

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Humanity (or a specific representative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension</td>
<td>A challenge that could lead to a suboptimal future.</td>
</tr>
<tr>
<td>Events</td>
<td>How the world will evolve with/without your work.</td>
</tr>
<tr>
<td>Resolution</td>
<td>Your research leads to a better future!</td>
</tr>
</tbody>
</table>
...or a research story can be about your object of study.

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Object(s) of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension</td>
<td>The object can’t do what it wants to / what we want it to</td>
</tr>
<tr>
<td>Events</td>
<td>What happens to that object (+ how your work changes it)</td>
</tr>
<tr>
<td>Resolution</td>
<td>Your research helps the object!</td>
</tr>
</tbody>
</table>
Worksheet

Draft your Hourlgass: 1 bullet point per box.

**Establish significance:**
A problem your audience cares about.

**Describe the status quo:**
What we currently know/do...

**Identify a gap:**
We need to know/do...

**What did you do?**
In order to know/do...

**Fill the gap:**
You found (or could find)... We now (or could) know/do...

**Re-establish significance**
The problem is (or could be) improved.
Stories follow a few common narrative arcs.

**Rise-fall-rise**

- Life is terrible
- Something wonderful happens!
- But it’s not enough. Challenges arise.
- A better equilibrium is reached
- Our heroes save the day!

---

Medical tests at the doctor can be painful, like through needles.

Devices can test for molecules through breath, but are large and expensive.

Nanocantilevers could measure molecules in breath, but we need more sensitive measurements.

To enable more sensitive measurements, she figured out a way to attach gold wires to nanocantilevers.

Bend in gold wires can be measured electrically, and allows for more sensitive measurements.

More sensitive measurements could lead to painless medical tests through breath.
Stories follow a few common narrative arcs.

**Fall-rise**

- Life is normal
- Equilibrium is disrupted
- Oh no! All is lost!
- Our hero saves the day!
- A better equilibrium is reached

Power electronics have been getting smaller and more efficient thanks to better switches.

But size/efficiency are now limited not by switches, but by magnetic components.

Designing small, efficient magnetic components is hard!

We developed a new magnetic structure that has excellent performance.

Power electronics have a new way forward.
Stories follow a few common narrative arcs.

“We all know that if you drop your cell phone, bad things happen.”

“But why? What if we could toss our phones around with impunity?”

<Insert research on flexible electronics... >”

“Unbreakable phones! Flexible solar panels! The possibilities are endless!”

“Life is normal” is questioned;

Our hero saves the day!

Life is amazing
Worksheet

Choose your narrative.

1. Decide who the **character(s)** for your story will be.

2. Choose + fill out a narrative arc using your Hourglass outline.

- **Rise-fall-rise**
- **Fall-rise**
- **Rise**
A story has a **beginning**, a **middle**, & an **end**.

- **Beginning:**
  - Grab attention!

- **Middle**

- **End**
  - Create satisfaction
  - Create optimism
  - Create curiosity
You can grab the audience’s attention with a set of standard beginnings (hooks).

**Grabber (startling/surprising)**

“Why is it so hard to kill a zombie? If you’ve ever watched a zombie movie, you’ve noticed that they’re pretty tenacious. Well, unfortunately for us, some cancer cells act just like zombies.” Inspired by Trinh Hua

**Quote**

“‘It’s like every time I take a breath, someone’s forcing me to breathe through a straw.’ That’s how Cassie, a patient in western Massachusetts, describes living with cystic fibrosis.” Inspired by Amanda Bordin

**Back to the beginning**

“This tool will let drug companies find these ‘cancer zombies.’ Because as Sun Tzu famously said, ‘to defeat your enemy, you must know your enemy.’”

Inspired by Trinh Hua

“Ultimately, we can help Cassie here breathe a little easier.”

Inspired by Amanda Bordin
You can grab the audience’s attention with a set of standard beginnings (hooks).

<table>
<thead>
<tr>
<th>Immersive scene or image</th>
<th>Back to the future</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Imagine a crystal clear lake, the water as still as glass. You can see fish, birds, and beautiful, vibrant colors. You just know that life in and around this lake thrives. Unfortunately, every day this image gets further and further away from reality.” —Mariam Elmarsafy</td>
<td>And 10 years from now, your community could be living in the middle of a thriving oasis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ask a question</th>
<th>So the next time you find some money (likely in a gift card), ask yourself ‘What happens next?’</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I want to start with a story about Susie. Susie has just finished her shift...feeding meals to the homeless. On her way home, she comes across a wallet...with [fifty dollars] inside. What happens next?” —Sophie Cameron</td>
<td></td>
</tr>
</tbody>
</table>
Worksheet

Draft your opening & closing lines.

Opening Techniques

- Grabber (startling/surprising)
- Quote
- Invite audience to do something
- Immersive scene or image
- Anecdote
- Point out something on your slide

Closing Techniques

- Restate significance
- “Bookend” (circle back to start)
- Forward-looking prediction
- Quote
- Humor or pun
- Call to action
Stories often have metaphors, which can connect what the audience doesn’t know to what they do know.

A nanocantilever...  ...is like a diving board
Guiding principles for **metaphors**:

1. Keep them **accessible**.

2. Stick to a **small number** of **consistent** metaphors.

3. **Map** the metaphor back to the technical domain.

4. **Test-drive** metaphors on multiple audiences.
1. Distill a **central message**

2. Structure a **memorable, exciting story**

3. Sketch a **visually appealing slide**
Visuals should be **simple** and **illustrative**.

- <5 Images
- Large font (or none)
- Simple versions of technical figures
Worksheet

Sketch your slide.

To support your story,

- Sketch a title that communicates your main message.
- Sketch 1-3 simple and illustrative images.
- (Optional: Draft 1-3 accompanying bullet points)
In this workshop you...

1. Distilled a central message from complex ideas about a research topic.

2. Structured a story that is memorable and engaging.

3. Sketched a visually appealing slide that supports your message & story.

Attend the next workshop:

Deliver to Win: How to Present Your 3-Minute Talk Effectively:

Wednesday, February 21st; 3:30-5 PM ET; to work on your presentation delivery!
Any questions? Next steps to remember:

- Presentation delivery workshop on **Feb 21, 3:30-5:00pm**
- Get 1:1 coaching to develop + practice your talk:
  - Communication Labs
    [mitcommlab.mit.edu/find](https://mitcommlab.mit.edu/find)
  - CAPD:
    Grads ➔ Career Advisors [capd.mit.edu/services/appointments](http://capd.mit.edu/services/appointments)
    Postdocs ➔ Dr. Simona Rosu [srosu@mit.edu](mailto:srosu@mit.edu)
  - Writing & Communication Center
    [cmsw.mit.edu/writing-and-communication-center](https://cmsw.mit.edu/writing-and-communication-center)
- Deadline for submitting your talk as a video: **March 11**
- **Showcase:** **April 17**