CI Expertise/Communication: Explaining Complex Technical Topics to Researchers

Dirk Colbry
Michigan State University

Leading and Listening in Complex CI Conversations

Dirk Colbry
Michigan State University

Agenda

- **(5 minutes) Introduction**
- (10 minutes) Methods for Leading in Complex Conversations
- (20 minutes) Breakout Activity: The "Speaker"
- (5 minutes)   Large Group Debrief
- (10 minutes) Methods for Listening in Complex Conversations
- (20 minutes) Breakout Activity: The "Listener"
- (20 minutes) Large Group Debrief & Roundtable

CyberAmbassadors
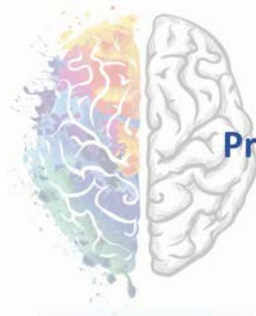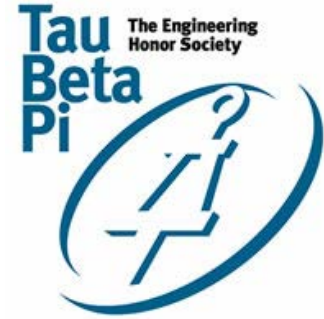
Effective Communication…

…occurs when information is both **shared** and **understood**

…builds trust and fosters relationships

…helps the **speaker** communicate needs and goals

…helps the **listener** understand and participate in solutions

Improving Communication Skills

- Communication is a major topic of research

  - Effective communication skills can be taught!

  - There are tools (algorithms) that apply across many scenarios

  - Role playing / rehearsal activities are effective learning tools

  - **Practice** is most effective **in context**

Feedback and Examples

- Please let us know what you think!

    - What is working well or helpful?

    - Which examples / scenarios can be improved?

    - What other challenges, contexts or situations should we explore?

- Email feedback to colbrydi@msu.edu

- Join the CyberAmbassador interest list by emailing colbrydi@msu.edu

Complex Communications for CI Professionals

- (5 minutes)   Introduction
- **(10 minutes) Methods for Leading in Complex Conversations**
- (20 minutes) Breakout Activity: The "Speaker"
- (5 minutes)   Large Group Debrief
- (10 minutes) Methods for Listening in Complex Conversations
- (20 minutes) Breakout Activity: The "Listener"
- (20 minutes) Large Group Debrief & Roundtable

Our Context: Roles, Definitions and Tools

Speaker
- Initiates or leads the conversation
- Goal is to communicate the CI problem
- May be a CI user, professional, etc.

Speaker's Tools
- Reducing Jargon
- Using Good Analogies
- Checking for Understanding

Listener
- Listens to the speaker
- Goal is to understand the CI problem
- May be a CI user, professional, etc.

Listener's Tools
- Reflective / Active Listening
- Paraphrasing
- Asking Clarifying Questions

What is "Jargon"?

According to Google: "Special words or expressions that are used by a particular profession or group and are difficult for others to understand."

- Discipline-specific terms
- Words with multiple meanings
- Cultural references
- Idioms
- Acronyms

Speaker Tool: Reducing Jargon

1. Before you speak, think about what might be considered jargon?

    a. What is the disciplinary background of the audience?

    b. What is the cultural/language background of the audience?

    c. What is the level of expertise in the audience?

2. Choose whether to explain or eliminate the jargon

    a. **Explain** when understanding the jargon is essential to solving the problem

    b. **Eliminate** when the jargon is secondary to the problem at hand

What is an Analogy?

According to Google: "A comparison between two things, typically for the purpose of clarification or explanation."

"I SEE NOW! YOU'RE TALKING APPLES AND I'M THINKING ORANGES!"

Speaker Tool: Using Good Analogies

- A good analogy

  - Fits the context

  - Increases understanding

- But be cautious!

  - Analogies have inherent limits, and will eventually break down

  - Analogies can cause confusion if they are not understood – beware the cultural reference!

Speaker Tool: Checking For Understanding

- As the speaker, your goal is to be understood

- Check for understanding by asking questions that encourage the listener to respond

    Example: "Whew! I just threw out a lot of information. Would you mind sharing what you think is going on so I can see if my explanation made sense?"

    Example: "So, what questions do you have about the situation I just described?"

- Avoid yes/no questions ("Do you understand?")

Speaker Example: Embarrassingly Parallel

The Context: Nan is a graduate student using a software program to analyze experimental data; the program takes approximate 10 minutes per input, but produces the correct results. Nan has a new data set with 10,000 inputs and wants to figure out how to speed things up by running on the HPC system, but Nan doesn't have a lot of programming experience and has never used the HPC.

The Speaker: Jamie is a researcher-facing CI consultant that works for the university's HPC center. After a quick code review, Jaime can see that Nan's program can easily be run in parallel on the HPC system.

Jamie's First Attempt

Jamie says: "I've looked though your code and I think you can make it go faster. Your problem is Embarrassingly Parallel. You just need to write a submission script to distribute your program across many nodes. Here is a website to help you get started. That makes sense? Right?"

- Did Jamie use any Jargon?

- How well do you think Nan now understands the problem?

- What response will Nan likely have to this explanation?

Jamie's Second Attempt

Jamie says: "I've looked though your code and I think we can make it go faster by running it in parallel. Do you know what that means?"

Nan says: "No"

Jamie says: "This is a type of problem I consider to be pleasantly parallel. Imagine that each of your inputs needs to make a road trip across the USA. You want them to get to the destination as fast as possible, but you don't care what order they arrive or whether they take the same roads to get there. Running in parallel is like having many different cars and roads so more of your inputs can go at the same time. We need to write a program to tell the system how to run your inputs on many different computers. What do you think about this plan?"

Complex Communications for CI Professionals

- (5 minutes)   Introduction
- (10 minutes) Methods for Leading in Complex Conversations
- **(20 minutes) Breakout Activity: The "Speaker"**
- (5 minutes)   Large Group Debrief
- (10 minutes) Methods for Listening in Complex Conversations
- (20 minutes) Breakout Activity: The "Listener"
- (20 minutes) Large Group Debrief & Roundtable

Breakout Activity: The "Speaker"

- It's time to practice the "Speaker" role, using the tools you've learned
  - Reducing Jargon
  - Using Good Analogies
  - Checking for Understanding

- You will be split up into groups of three, and rotate through three roles:
  - The **CI-Professional's** role is as the speaker in the scenario, who has the goal of communicating the problem (described in the scenario) using the speaker tools
  - The **Actor's** role is to listen and respond to the speaker, following the guidelines you're given in the scenario – have fun acting and trying to make the speaker use the various tools appropriately before you "give in" and the scenario ends
  - The **Coach's** role is to observe the interactions between the speaker (CI-Professional) and listener (Actor) and provide feedback to both participants; coaches are free to "pause" the scenario and offer advice to keep things on track

Logistics

- Break out into groups of 3 (if necessary, groups of 4 can have 2 coaches)
- Pick roles for the first example (CI-Professional, Actor and Coach)
- Read YOUR ROLE (don't cheat and look at the other links – than spoils the fun!)
  1. Go to: https://tinyurl.com/ACIpractice
  2. Choose the First Breakout link, then the first example, then your role
- Do the rehearsal exercises
  1. The CI-Professional (speaker) starts the scenario, and the Actor responds
  2. The Coach provides advice as needed, and offers feedback at the end
  3. Afterwards, rotate roles and try the next scenario
  4. There are three (3) practice scenarios, which should take 5-8 minutes each
- Come back here for a large group discussion at the end of the breakout sessions

Speaker Example 1
Hardware Refresh

Speaker Example 2
Data Center Committee

Speaker Example 3
Bad News

Complex Communications for CI Professionals

- (5 minutes)   Introduction
- (10 minutes) Methods for Leading in Complex Conversations
- (20 minutes) Breakout Activity: The "Speaker"
- **(5 minutes)   Large Group Debrief**
- (10 minutes) Methods for Listening in Complex Conversations
- (20 minutes) Breakout Activity: The "Listener"
- (20 minutes) Large Group Debrief & Roundtable

Complex Communications for CI Professionals

- (5 minutes)   Introduction
- (10 minutes) Methods for Leading in Complex Conversations
- (20 minutes) Breakout Activity: The "Speaker"
- (5 minutes)   Large Group Debrief
- **(10 minutes) Methods for Listening in Complex Conversations**
- (20 minutes) Breakout Activity: The "Listener"
- (20 minutes) Large Group Debrief & Roundtable

Our Context: Roles, Definitions and Tools

Speaker
- Initiates or leads the conversation
- Goal is to communicate the CI problem
- May be a CI user, professional, etc.

Speaker's Tools
- Reducing Jargon
- Using Good Analogies
- Checking for Understanding

Listener
- Listens to the speaker
- Goal is to understand the CI problem
- May be a CI user, professional, etc.

Listener's Tools
- Reflective / Active Listening
- Paraphrasing
- Asking Clarifying Questions

Listener Tools

- As CI Professionals, when we are in the listener role our goal is to understand the problem so that we can help find solutions

    - Use **Reflective / Active Listening** to make sure the speaker feels heard. This is particularly helpful in situations with strong emotions.

    - Use **Paraphrasing** to make sure you (the listener) truly understand the situation.

    - Use **Clarifying Questions** to obtain additional information you need to help solve the problem.

Listener Tool: Reflective Listening

1. Listen with the goal of truly understanding the speaker
   - Pay attention to both words and body language
   - Watch for strong emotions (anger, frustration, worry)

2. Reflect back to the speaker what you heard, using "I" statements
   - **Correct:** "What I understood was…"
   - **Incorrect:** "You said…"

3. If strong emotions are expressed, acknowledge without judgement
   - **Correct:** "That sounds really frustrating…"
   - **Incorrect:** "Calm down! You're blowing this completely out of proportion…"

Listener Tool: Paraphrasing

- Use paraphrasing when you are trying to understand a complex problem

  1. Listen to the speaker carefully

  2. In your own words, state the parts of the situation you understand (avoid adding jargon!)

  3. Allow the speaker to confirm, or to clarify, your understanding

- Paraphrasing is NOT the same as parroting

  - To use an analogy: paraphrasing is a lens, while parroting is a mirror

Listener Tool: Ask Clarifying Questions

● As the listener, your goal is to understand in order to help solve problems

● Use clarifying questions to obtain additional information you need to help

○ "What programming language does your software use?"

○ "Can you tell me a bit more about the team that wrote the code?"

○ "Have you ever used the HPC before?"

Listener Example: Complex Cold Consulting

The Context: Dana is a PI who stopped by HPC office hours. Researcher-facing CI-Professional Kim is there, and listens as Dana says:

"I am SO frustrated! I have a lot of data I need to process using the Sanborn-Stratta method, which is better than the more common FCFD approach. However, my transient error is much larger than the latent error. I think I can reduce the transient error by increasing the Tallholm threshold, but then the software will not run on my computer. So, I need you to make it run on the supercomputer!"

How should Kim respond?

Complex Communications for CI Professionals

- (5 minutes)   Introduction
- (10 minutes) Methods for Leading in Complex Conversations
- (20 minutes) Breakout Activity: The "Speaker"
- (5 minutes)   Large Group Debrief
- (10 minutes) Methods for Listening in Complex Conversations
- **(20 minutes) Breakout Activity: The "Listener"**
- (20 minutes) Large Group Debrief & Roundtable

Breakout Activity: The "Listener"

- It's time to practice the "Listener" role, using the tools you've learned
  - Reflective / Active Listening
  - Paraphrasing
  - Asking Clarifying Questions

- You will be split up into groups of three, and rotate through three roles:
  - The **CI-Professional's** role is as the listener in the scenario, who has the goal of understanding the problem using the listener tools
  - The **Actor's** role is to communicate the problem, following the guidelines you're given in the scenario – have fun acting and trying to make the listener use the various tools appropriately before you "give in" and the scenario ends
  - The **Coach's** role is to observe the interactions between the listener (CI-Professional) and speaker (Actor) and provide feedback to both participants; coaches are free to "pause" the scenario and offer advice to keep things on track

Logistics

- Break out into groups of 3 (if necessary, groups of 4 can have 2 coaches)
- Pick roles for the first example (CI-Professional, Actor and Coach)
- Read YOUR ROLE (don't cheat and look at the other links – than spoils the fun!)
    1. Go to: https://tinyurl.com/ACIpractice
    2. Choose the First Breakout link, then the first example, then your role
- Do the rehearsal exercises
    1. The Actor (speaker) starts the scenario, and the CI-Professional (listener) responds
    2. The Coach provides advice as needed, and offers feedback at the end
    3. Afterwards, rotate roles and try the next scenario
    4. There are three (3) practice scenarios, which should take 5-8 minutes each
- Come back here for a large group discussion at the end of the breakout sessions

Listener Example 1
Slow Code

Listener Example 2
Software Debugging

Listener Example 3
GPUs are the BEST!

Complex Communications for CI Professionals

- (5 minutes)   Introduction
- (10 minutes) Methods for Leading in Complex Conversations
- (20 minutes) Breakout Activity: The "Speaker"
- (5 minutes)   Large Group Debrief
- (10 minutes) Methods for Listening in Complex Conversations
- (20 minutes) Breakout Activity: The "Listener"
- **(20 minutes) Large Group Debrief & Roundtable**

Round table

- How did this session go?
- Did you find the practice helpful?
- Does anyone want to share an observation or experience from their group?

Feedback and Examples

- Please let us know what you think!

    - What is working well or helpful?

    - Which examples / scenarios can be improved?

    - What other challenges, contexts or situations should we explore?

- Email feedback to colbrydi@msu.edu

- Join the CyberAmbassador interest list by emailing colbrydi@msu.edu