

Giving Good Talks Isn't as Hard as it Looks



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What is a talk?



A talk
is really nothing more than a
story

Caveats

- ✍ This talk may not make you a gifted speaker
- ✍ None of the rules that I give you are iron clad
- ✍ You will need to modify these rules to suit your personal speaking style

Your mileage may vary!

Some reasons for sharpening your communication skills

- ✍ Probably **the single most important** aspect in job hunting is your interview talk. The interview talk can make or break the interview
- ✍ Giving talks is expected in many jobs and can be a critical factor in job success
- ✍ If you're heading into academia then you'll be giving talks almost every day!

What types of talks are there?

- ✍ Job interview
- ✍ Present a new result, e.g. at a conference
- ✍ Status report for a project
- ✍ Argue for/against something

Each of these talks will be different
but the basic structure will be the
same !

There are three key elements

 **What is your message?**

 **Who's the audience?**

 **How are the pieces connected?**

The Message



What is your message ?

- ✍ Should be able to answer the question -
What's your point?
- ✍ Should be short, 2-3 sentences at most
and understandable at a high level
- ✍ Short talks should have only one message

**Most common mistake is not
having a clear message**

Everything in your talk should support your message

- ✍ Start with the message and work backwards in developing your talk
- ✍ It's incredibly easy to fall into the trap of thinking that
 - ✍ _____ is just too interesting to let the audience miss
- ✍ If you're not sure, ask yourself once again - What's your point?

The Audience



Who's the audience ?

- ✍ Would you give a talk in Spanish to an English speaking audience?
- ✍ Would you give a talk on QCD to kids in elementary school?
- ✍ Would you give a talk on the wonders of optimization theory to engineers?

You need to tune the talk to the audience

- ✍ Need to be able to answer the question – Why should I care?
- ✍ Find out the demographics of an audience and why they are there
- ✍ Emphasize or de-emphasize parts of your argument

Second most common mistake is using the same talk for all audiences

Putting it together



How to structure your talk

- ✍ It's not enough to lay out the key elements - you need to show how they fit together
- ✍ Walk the audience through your key points
- ✍ Most talks suffer from too much detail and not enough overview

Third most common mistake is to give details rather than showing the connections

Fitting the pieces together – Sample 30 minute talk

Set the stage (5-10 minutes)

-  Tell the audience what the main issues are
-  Lay out your problem/issue
-  Describe why it's important!

What happened (10-15 minutes)

-  How was the problem resolved
-  Only need the key ideas here
-  Don't necessarily need chronological order

Summarize (5 minutes)

Questions?

Some Tips and Tricks



Try to keep your points simple

- ✍ Use at most 3 points at any given time
- ✍ Most people/societies/cultures have a hard time dealing with more than 3 things at one time
- ✍ Remember that for a large part of your audience the material is new

Give specific examples wherever possible

- ✍ Examples can be used to clarify a given point
- ✍ Examples can be used to create a big impact
- ✍ Most audiences relate to visual examples better than to written examples

Model-based Safety Assessments Can Be Used to Simulate Accident Scenarios (Take 1)

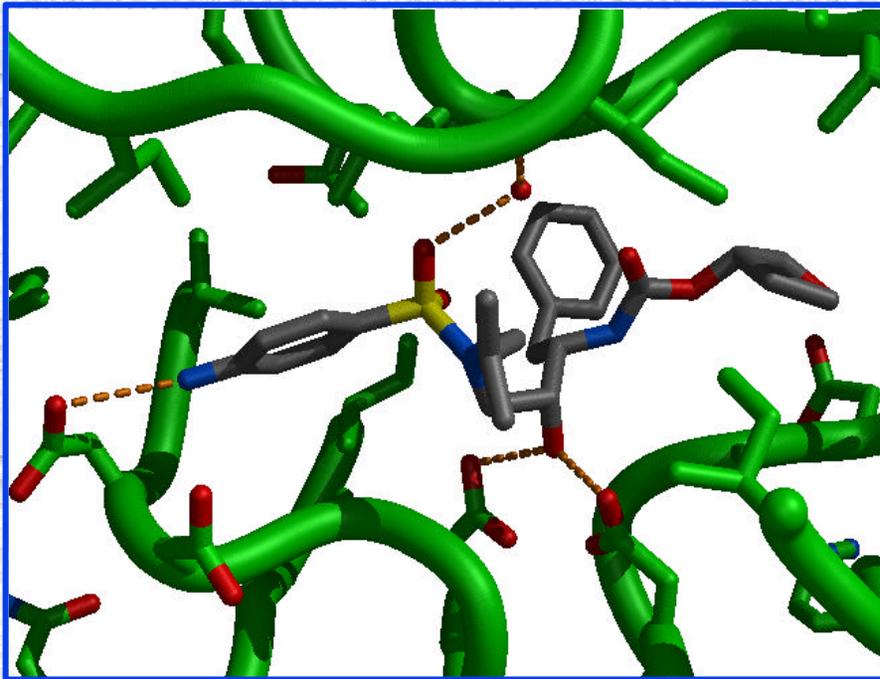
- ✍ The goal is to determine the worst-case response in an accident
- ✍ This problem is described by a coupled set of nonlinear partial differential equations that include Navier-Stokes, thermal, and structural dynamics equations
- ✍ The simulation of coupled sub-systems requires new methods
- ✍ The geometries and complex physics required make this a very difficult problem

Model-based Safety Assessments Can Be Used to Simulate Accident Scenarios (Take 2)



- ✍ Goal is to determine the worst-case response
- ✍ Simulation of coupled sub-systems requires new methods
- ✍ Complex physics and 3D geometries make this a difficult problem

Drug design is an energy minimization problem



HIV-1 Protease Complexed with Vertex drug VX-478

- ✍ A single new drug may cost over \$200 million to develop and the design process typically takes over 10 years
- ✍ There can be thousands of parameters and constraints
- ✍ There are thousands of local minima

Some essential elements that should be included in a seminar talk

✍ Why is this problem important?

✍ Why should I care?

✍ What was the outcome/product/....

✍ Is there a tangible result?

✍ What was **your** contribution?

✍ Use words like, *"This is my main result"*

Handling questions

- ✍ Make sure you understand the question
- ✍ Prepare for the obvious questions
- ✍ Try to answer all questions, but some questions can/should be deferred

Don't Panic !

Top 10

- 1) Have a clear message you want to deliver
- 2) Prepare for your audience
- 3) Tie the pieces together into a story
- 4) Only use material that supports your message
- 5) Avoid unnecessary details
- 6) Use (visual) examples to clarify your points
- 7) Outline the importance of your problem
- 8) Present your contribution
- 9) Prepare for questions
- 10) Practice

Some references

 J. Asher, *Even a Geek Can Speak*

 N. Higham, *Handbook of Writing for the Mathematical Sciences*, SIAM.

 T. Kolda, *How to Give a Talk*,

<http://csmr.ca.sandia.gov/~tgkolda/abstracts/giving-a-talk-snl-2001.html>

 G. Spence, *How to Argue and Win Everytime*

 J. Wetherbe and B. Wetherbe, *So, What's Your Point?*

The End

