

Stories from the Front Lines - Technology Transfer Terrors and Triumphs

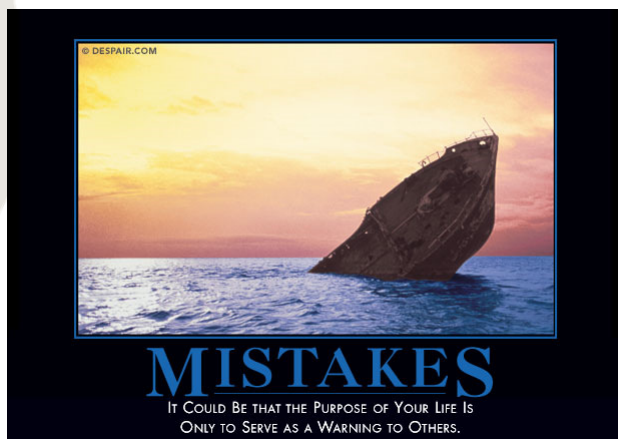
Jeremy M. Shaver

Barry M. Wise

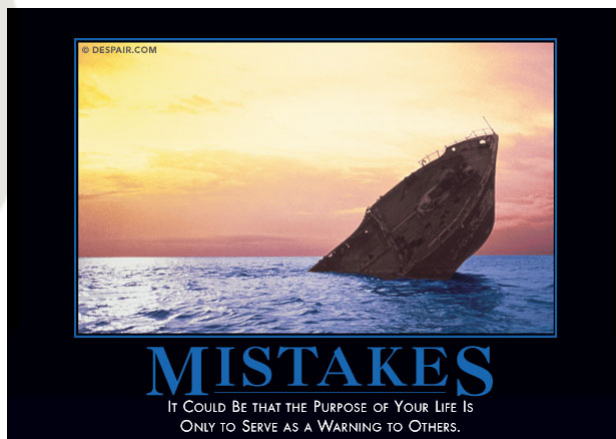
Eigenvector Research, Inc.



It could be that the purpose of your life
is only to serve as a warning to others...



...it is incumbent on the rest of us to heed those warnings so that your failures weren't for naught!



1) Researchers using an insufficient amount, or insufficiently rigorous validation data to prove a technique.



Validation Issues

- If you use only 10 validation samples with a classification method that is 70% accurate (*probably insufficient*) there is a **1 in 35** chance of getting 100% correct

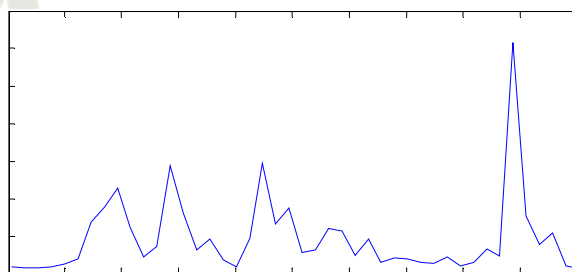


(There is a natural selection for under-validated methods!)

- Also: If you don't sufficiently sample across population, results will be overly optimistic
- Companies end up expecting that same level of accuracy from a large-scale validation study
- Validation **MUST** be rigorous *or* full-disclosure given



2) Researchers insufficiently determining and relaying what instrument characteristics need to be reproduced to achieve similar results.



Instrument Characteristics

- The instrument used to prove a method is almost never the same as that used in a final application
 - Cheaper, smaller, lighter almost always means lower performance
- Decisions on instrumental changes can only be safely made with an understanding the physics/chemistry/biology (e.g. will reducing the resolution influence the ability to measure that critical shoulder on the peak?)
- Researchers may prove a method works, but often don't research ***at what point it will fail!***



3) Companies hiring staff of engineers, marketing, and fundraisers, but forgetting to hire physical scientists with familiarity in the methods.



Commercial Instrument Production Requires Additional Science

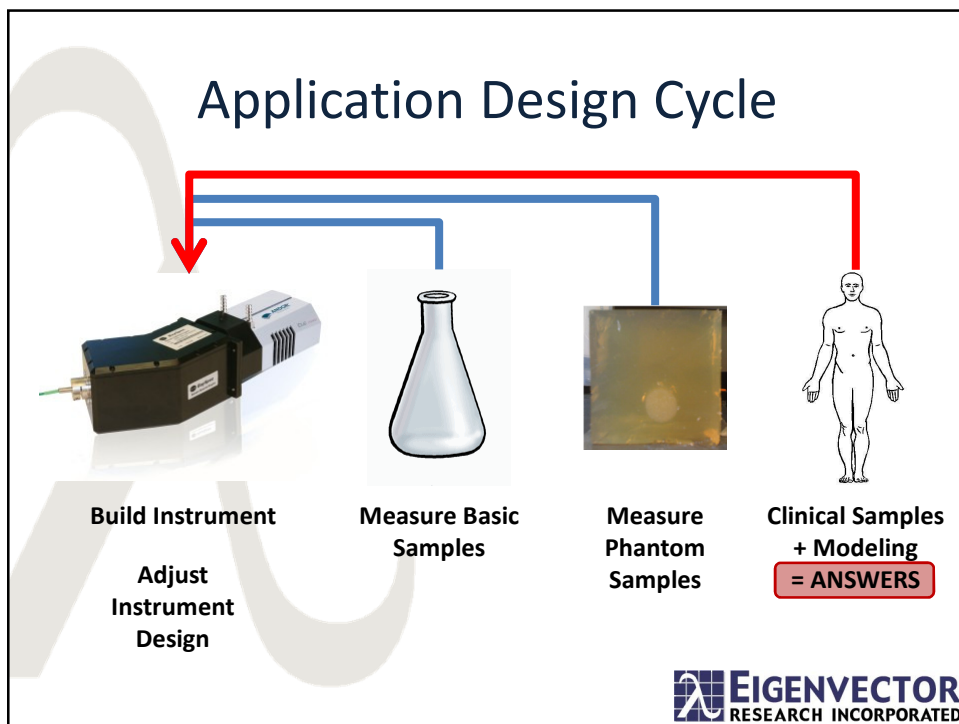
- Applications proven in the lab will rarely translate as-is to a commercial instrument
- Engineers are great, but you cannot engineer out the need for understanding the science



 **EIGENVECTOR**
RESEARCH INCORPORATED

4) Companies underestimating
the variability in the real world.

 **EIGENVECTOR**
RESEARCH INCORPORATED



Engineer the Application, Not Just the Instrument

- Anticipate Variability - Expect iterations of the COMPLETE sequence and learn from failures.
- Eventually you are going to have to stick the probe in an armpit! (ala Paul Pudney, 2013 Meggers Award)

EIGENVECTOR
RESEARCH INCORPORATED

People talk about there being funding for basic research and fully commercialized instruments, but a **funding gap** for clinical trials.

I believe there is a **scientific gap** between Bench-top research and Clinical Trials where researchers and companies insufficiently characterize the science and instrumentation to make the leap.

