[SQUEAKING]

[RUSTLING]

[CLICKING]

RICHARD DE NEUFVILLE: So in equation form, the expected value of information is this one-line formula. It basically says, the expected value after the test is the expected value without the test. So the expected value after the test is you calculate that based upon your-- fro doing the decision tree, your optimal set of decisions. And that's simple.

Now, the expected value star, which means that it's the best choice, subscript of k, it is the optimal decision given the test result k. So as I suggested before, if you have five test results, you have five different revisions of the probabilities. You have five different possible answers. So there's D, the best set of decisions, is indexed to the number of test results for example five.

So each test result that might be possible has a probability of occurring. And it also then revises the probabilities afterwards. So there's the pk, the probability of occurring, the probability afterwards to the posterior probabilities of pjk. And then the Dk star, the optimal decisions after the test, calculates using the prior revised probabilities.

Are you confused yet? Well, maybe if you've been through all this before, you're not confused. And in principle, it's very simple. But as I've shown you, I hope, through this indexing of k and i and j and D and ij combined and so forth, this is a confusing approach to do. And you're not likely to be able to do it very well.

So I would like now to-- first of all, are there any questions or comments that you might have at this point? I'm trying to show you-- give you a feel for, given that you make a test result and you get results, what is happening, in fact, in terms of what should be happening in terms of your revision process of the probabilities.

All right, so let me give an example. Suppose a company decides to run a prototype plant, and it can anticipate possible results-- for example, the operation is good, medium, or poor. For each test result-- I will change this typo here-- how would you calculate it?

So for example, if you had a poor result, it implies that maybe the system is going to work and won't work. So the optimal decision would be not invest, so that getting this information may have significant impacts on the decision to be taken.

So how would you do this? How would you analyze the overall result? So you'd estimate the probability of each possible test result-- good, medium, or poor. That's hard to do, just as Robert has suggested. How do I know that this thing that I haven't done before is going to lead to good, medium, or poor results? Well, what do I base that assessment of probability?

Well, if you've done it 50 times and you have a good track record on it, maybe you have an idea that you could get these numbers within reason, maybe to a first decimal point, I mean, like 0.7 or 0.5. But that's a pretty murky thing right there.

But then you have to calculate the optimal decision, and you would have to then sum these up to get the expected probability value after the test. So it's a complicated thing. And ultimately, you would have to say, all right, I'm going to calculate this value from my best design to an estimated value of my best design after the test. And you go through all this process.

And here's where Robert was talking about. Somehow they have to come with a prior probability of the test results. They have to have the conditional probability of the association of the test results for the correlation with the actual priors. And you get to a complicated situation where-- I think Robert described it very well. Sometimes they're-- well, I'm not sure the words he used.

The point of this first phase of the presentation is that the full analysis is a complicated process with many possible outcomes. It involves a lot of assumptions-- the probabilities outcomes of the test. So the full analysis cannot be accurate even if the math is correct. So bottom line from this approach is I encourage you to be skeptical of such detailed analysis, and you need some alternative to get an assessment of the value of information. That's the point of this process.