**Andrea Malagoli, PhD**

Interesting, but I think there is a general problem with much of the academic literature on the subject: the idea that there should exist an ideal ‘rational’ agent who would be better capable at prediction than the typical biased, irrational one.

This rational agent is never properly defined, but reading between the lines it turns out the rational agent is actually rather myopic. The typical rational agent on facts is a mechanical actor who calibrates expectations using the past and assuming that things in the future will work more or less the same. For this rational agent, the problem of rational prediction boils down to a computational problem of weighting a number of probabilistic future states of the world.

But here lies the fallacy. It is one who gets to assume that we know exactly all the future, albeit uncertain, possible states. It is another to accommodate for the existence of potential future states that we know not of. This is basically Keynes distinction between ‘uncertainty’ and ‘unknowability’. This distinction fundamentally alters the process of rational decision making: rational decision making leads to optimally wrong decision when unknowable states exist. “Irrational” is actually rational then.

**Ivo Steijn, PhD**

Ah yes, remember Donald Rumsfeld and his "unknown unknowns"... Another area where Nassim Taleb's recommendation holds: build things that are not fragile when your assumptions (your known unknowns) turn out to be false.

**Jim Bozin**

1. The further the event is from the forecast, the more the uncertainty rises. aka: cumulative probability. ie, more things can occur 0ver time, so less chance of outcome.

2. In order to discriminate “noise”, one needs to know what the noise is but is path/measurement system dependent and aftermath of the event – which isn’t predictable – have to have the answer before hand? Ok, retrospectively for investigation of algorithm variables, but not as easily discriminated going forward. Even if one accounts for noise, may not increase accuracy. What is noise in one path will not necessarily will be so in another. Noise is classically measurement uncertainty(signal to noise ratio), and as in #1 that increases with forecast distance. If my aim is off 0.001%, the further I am from the target the more the absolutee distance I can miss a discrete target. Same applies here. This can be over come with course corrections(forecast updates), but I’m doubtful from initial adjustment due to normal variation. Why laser or GPS guided munitions were developed. eg; even the most accurate gun still has a probability to misfire. In project schedules we use “float” for this.

3. The other aspect is how much has to occur in order for the event to occur(as possible pathways/pathway dependence/complexity). If I say, I’ll be on Mars tomorrow or will sell a zillion units next week, it’s almost an absurdity = 0. But if I predict that in 100 years someone has a 40% chance, it’s a more likely outcome and better “prediction”. At 40%, no guarantee of hitting either. This is the inherent problem with predicting weather out over a week and climate out 50 years. People have tried to explain it away, but it’s inherent. Central tendency applies. The uncertainty rises to a level higher than can be defined upfront. This does not stop people “playing with computers” from trying to predict the answer from the random number generator, next election, or the lotto… One can’t live in a probabilistic environment and expect complete certainty. What is “good enough”? and how to deal with it, is better for outcomes – ie, management.

**Harvey Stein**

The article cites the working paper, “Bias, Information, Noise: The BIN Model of Forecasting”. It should also give the full citation.

**John Bassier**

I would like to mention, since Ms. Mellers didn’t, that there is great controversy over the use of algorithms in making bail decisions. While they do reduce “noise” (judgment errors), one at least (COMPAS, a proprietary model whose structure and content has not been disclosed) has been found to be biased, in that it is overly lenient with white defendants and overly harsh with blacks. This is believed to be due to the biases built into the training data used to “teach” the algorithm how to arrive at its decisions.