Selected paper: Bayesians, Frequentists, and Scientists

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Summary:

This paper throws out a comparison between Bayesians and Frequentists about how they view things differently, and what kind of evidence they stand on when they are carrying out a data analysis. The author majorly lists two vivid examples and discovers the differences between them, from a cancer study and a kidney research, that Bayesians tend to use subjective methods based on Bayes rules and the important “priors” to build up probabilistic analysis, while Frequentists are seemed to be more objective and require very little from statistician. However, in modern world with whole bunches of complex data, Bayesian statistics has shown its trend to combine more objective uninformative priors into the researches, like the example of “empirical Bayes” approach. Scientists are more and more fond of using a combination taking consideration of both Bayesian and Frequentist views to work, and devote this trend into some technical development like the computer implementation of Markov chain Monte Carlo methods.

Thoughts:

I’m strongly agree with the view that both Frequentist and Bayesian methods should not be considered as rivals. Think about ourselves, our learning process is exactly a hybrid of these two. We take in prior information as we grow up, just reflect how we learn to talk. We need to hear how the pronunciations sound like before we can speak. This is a prior knowledge. And for frequentist methods, it is common that we learn the occurrence of some events by direct carrying out the probability calculation, like we throw a dice and tell ourselves the probabilities of showing any number from a simple division, without thinking too much about the priors. In the reality, if we become data analysts in the future, a combination of them will be a great help to our model, like a combination of priors and bootstrap mentioned in this paper. Finally, as the author indicates, classical statistics was fashioned for small problems, but with the increase of computation demands, it is shown that a burst of new theory and methodology would feature a combination of Bayesian and frequentist reasoning.