Christian Hennig
University of Bologna

On the interpretation of the mathematical characteristics of statistical tests

Statistical hypothesis tests are often misused and misinterpreted. Here I focus on one source of such misinterpretation, namely an inappropriate notion regarding what the mathematical theory of tests implies, and does not imply, when it comes to the application of tests in practice. The view taken here is that it is helpful and instructive to be consciously aware of the essential difference between mathematical model and reality, and to appreciate the mathematical model and its implications as a tool for thinking rather than something that has a truth value regarding reality. Insights are presented regarding the role of model assumptions, unbiasedness and the alternative hypothesis, Neyman-Pearson optimality, multiple and data dependent testing.