Testing approximate statistical hypotheses

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Abstract

Statistical hypotheses often take the form of statements about some properties of functionals of distributions of probability. Usually, according to a hypothesis the functionals in question have certain exact values. Many of the classical statistical hypothesis are of this form : the hypothesis about mathematical expectation of a normal sample (one-dimensional or multidimensional) ; the hypothesis about probabilities of outcomes in independent trails (which should be tested based on observed frequencies) ; the linear hypotheses in Gaussian linear models etc. .

Stated as suppositions about exact values those hypotheses do not express accurately the thinking of natural scientists. In practice an applied scientist would be satisfied if those or similar suppositions were "correct" in some approximate sense (meaning their approximate agreement with statistical data).

The above-mentioned discrepancy between applied-science approach and the mathematical expression of it leads to rejection of any statistical hypothesis given sufficiently large amount of sample data - a well known statistical phenomenon.

This talk will show how hypotheses about exact values can be re-stated as rigorously formulated approximate hypotheses and how those can be tested against sample data.