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Statistical inference: Decision-theoretic perspective

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Abstract

The controversy between the classical (frequentist) and Bayesian approaches has been shaping statistics for almost a century. Suppose you need to decide, based on the appearance of an acorn, whether an oak is a Quercus robur or a Quercus petraea. The Bayesian approach assumes a probability distribution of the two species prior to the observation, while the classical approach does not need or use such information. This talk presents a decision-theoretic point of view that suggests both approaches are just extremes of a continuum of approaches, and, mathematically, sets of probability distributions are an equivalent representation of consistent decisions. It is seen that optimal inferential procedures do not always exist, but often, even in a sequential setting, they do.

Keywords: Decision theory; Duality; Convex sets of distributions