

Likelihood Regions: An Axiomatic Approach

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Abstract :

We consider a reasoner who selects a set of distributions given a database of observations. A likelihood region is monotonic with respect to the likelihood function. We provide axiomatic foundations for such a selection rule. Starting with an abstract set of theories, we propose conditions on choice functions (across different databases) for which there exists a statistical model such that the choice function is a likelihood region relative to that model, for the general case and for the case of a fixed likelihood-ratio threshold. We interpret the results as supporting the notion of likelihood regions for the selection of theories.