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You May Believe You Are a Bayesian But You Are Probably Wrong

Abstract:

An elementary sketch of some issues in statistical inference and in particular of the central role of likelihood is given. This is followed by brief outlines of what George Barnard considered were the four great systems of statistical inferences. These can be thought of terms of the four combinations of two factors at two levels. The first is fundamental purpose (decision or inference) and the second probability argument (direct or inverse). Of these four systems the ‘fully Bayesian’ approach of decision-making using inverse probability particularly associated with the Ramsay, De Finetti, Savage and Lindley has some claims to be the most impressive. It is claimed, however, and illustrated by example, that this approach seems to be impossible to follow. It is speculated that there may be some advantage to the practising statistician to follow George Barnard’s advice of being familiar with all four systems.