

The Behavioral Implications of Statistical Decision Theory

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Abstract

Statistical decision theory (SDT), which models the information acquisition and decision under uncertainty problems as strategic games against Nature, is the preferred framework used to study information economics. Surprisingly, axiomatic representations of statistical decision theoretic models have hitherto been absent from the literature, leaving the exact behavioral implications of such models unclear. This paper provides axioms on preferences over the objects of choice of SDT — decision rules and experiments — that characterize a very general statistical decision theoretic model. Using the representation of this base model and a result that connects SDT to the Anscombe-Aumann framework, I then develop a methodology to import existing representation results from classic decision theory into SDT. I illustrate the power of this technique by providing representations of SDT versions of some widely used decision theoretic models. While I initially axiomatize preferences over decision rule-experiment pairs, many applications are concerned only with choices between decision rules for a given experiment, or with choices between experiments paired with a specific decision rule. To bridge the gap between the main representation results and these applications, I also characterize when such choices are derived from a single preference over pairs of decision rules and experiments.

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