

A New Solution to the Puzzle of Simplicity

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Abstract

Explaining the connection, if any, between simplicity and truth is among the deepest problems facing the philosophy of science, statistics, and machine learning. Say that an efficient truth-finding method minimizes worst-case costs en route to converging to the true answer to a theory choice problem. Let the costs considered include the number of times a false answer is selected, the number of times opinion is reversed, and the times at which the reversals occur. It is demonstrated that (1) always choosing the simplest theory compatible with experience and (2) hanging onto it while it remains simplest is both necessary and sufficient for efficiency.

Keywords: induction, ockham, simplicity, goodman, truth, convergence, akaike, formal learning theory, model selection, theory choice

Subjects: [General Issues: Confirmation/Induction](#)

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