A Lifetime of Irrelevance

Philip Dawid

Emeritus Professor of Statistics, University of Cambridge

The most important breakthrough in the history of Mathematics was the invention of Zero: the absence that conjures all presence into being. The zero of Probability and Statistics is Independence—not simply a useful tool for proving theorems, but, especially in its extension to Conditional Independence, a fundamental logical underpinning.

Conditional independence is a relation of Irrelevance. To say that X is independent of Y given Z—notated as $X \perp\!\!\!\perp Y \mid Z$—is to say that, once Z is known, Y becomes irrelevant to X. This simple understanding is enough to generate an axiomatic theory of conditional independence and irrelevance, with manifold applications both in and beyond Probability and Statistics.

Since I introduced the notation and abstract theory of conditional independence in 1979, it has formed a golden thread tying together many aspects of my research, both theoretical and applied. In this talk I will survey the rich formal structure and the variety of applications and uses of conditional independence, from paternity testing to statistical causality.