

Seminar

EVIDENCE IN STATISTICS

Quantifying Evidential Strength and Integrating Heterogeneous Evidence



FRIDAY
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IN PRESENCE
RG Vallisneri

Antonio Vallisneri Biology Complex, University of Padova



START AT
11:30 AM - 01:30 PM

VIA ONLINE
ON MICROSOFT TEAM

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ABSTRACT

A quantitative framework is presented for assessing and integrating empirical evidence in support of (causal) claims across study types, disciplines, and domains.

Four foundational dimensions—study design, methodological quality, measurement precision, and causal impact—are combined geometrically to yield a unified index of evidential strength, or evidentiality.

This approach extends traditional hierarchies of evidence by explicitly merging validity and reliability into a single, scale-invariant measure, enabling the comparison and synthesis of heterogeneous findings on a principled basis.

When coupled with the logarithmic weight of evidence (WoE), evidentiality provides both the strength and direction of empirical support for a claim. Correction factors for replication and conceptual alignment prevent redundant or weakly related results from inflating posterior certainty. By penalizing weak components and discounting correlated evidence, the approach provides a transparent and epistemically coherent foundation for deriving calibrated posterior belief about complex claims

