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Paradoxes and Probabilities: Revisiting quantum nonlocality in the graphical formalism of causal inference

Thursday, May 30, 2024 8:45 AM (30 minutes)

This talk aims to reveal the causal reasoning that underpins both the foundations of quantum theory and the superficially-unrelated data science framework of graphical models, also known as Bayesian networks. We will connect quantum nonlocality, as characterized by Bell's Theorem, with the idea of causal discovery in the presence of latent confounders. Understanding this relationship provides novel dividends to both fields: Causal inference sheds new light on device-independent randomness witnesses and measures of multipartite entanglement, and connection-aware statisticians are just beginning to recycle decades of insight around Bell's theorem. This talk is designed to transcend disciplinary boundaries and to enrich our understanding of causality in a quantum world

Keyword-1

quantum nonlocality

Keyword-2

quantum causal inference

Keyword-3

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