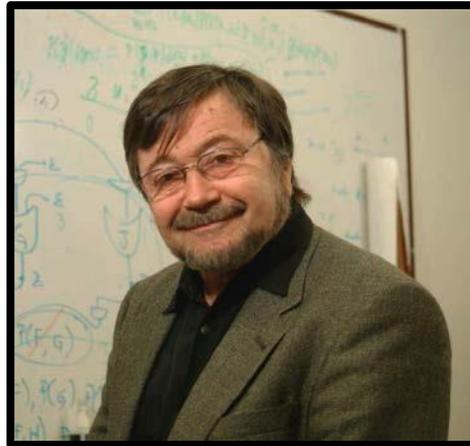




Institute for Data Sciences and Engineering
COLUMBIA UNIVERSITY

SEMINAR EVENT

DATE: MON, NOV 4
TIME: 11:00 A.M.
LOCATION:
DAVIS AUDITORIUM,
ROOM 412, SHAPIRO
CEPSR



SPEAKER: **Judea Pearl**
*Professor of Computer Science and Statistics
University of California, Los Angeles*

TITLE: **The Mathematics of Cause and Effect**

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Abstract:

Recent advances in graphical models and the logic of counterfactuals have had a marked effect on the way scientists treat problems involving cause-effect relationships. Paradoxes and controversies have been resolved, slippery concepts have been demystified, and practical problems requiring causal information, which long were regarded as either metaphysical or unmanageable can now be solved using elementary mathematics.

He will review concepts, principles, and mathematical tools that were found useful in this transformation, and will demonstrate their applications in several data-intensive sciences. These include questions of confounding control, policy analysis, misspecification tests, missing data, mediation, heterogeneity and the integration of data from diverse studies. The following topics will be emphasized:

1. What every student should know about causal inference, and why it is not taught in Statistics 101.
2. The Mediation Formula, and what it tells us about "How nature works"
3. What math can tell us about "external validity" or "generalizing across populations"
4. What causal models can tell us about missing data

Bio:

Judea Pearl is a professor of computer science and statistics at UCLA. He is a graduate of the Technion, Israel and has joined the faculty of UCLA in 1970, where he currently directs the Cognitive Systems Laboratory and conducts research in artificial intelligence, causal inference and philosophy of science. Pearl has authored several hundreds research papers and three books: *Heuristics* (1984), *Probabilistic Reasoning* (1988), and *Causality* (2000;2009). He is a member of the National Academy of Engineering, the American Academy of Arts and Sciences, and a Fellow of the IEEE, AAAI and the Cognitive Science Society. Pearl received the 2008 Benjamin Franklin Medal for Computer and Cognitive Science and the 2011 David Rumelhart Prize from the Cognitive Science Society. In 2012, he received the Technion's Harvey Prize and the ACM A.M. Turing Award.

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