THE BOOK OF WHY:
The New Science of Cause and Effect,

by Judea Pearl and Dana Mackenzie.
May 15, 2018.

"Correlation is not causation."

For over a century, this seemingly reasonable dictum of statistics metastasized into one of science's biggest obstacles, as researchers in all data-driven disciplines became unwilling to say if one thing caused another. But all this has changed with Judea Pearl and his colleagues, whose work over the past three decades has cut through the confusion and established causality-the study of cause and effect-on a firm scientific basis. His work shows how we know simple things, like whether the rain or a sprinkler made a sidewalk wet, as well as how we can answer hard questions, like whether a drug cured an illness.

Coauthored with the PhD mathematician turned science writer Dana Mackenzie, THE BOOK OF WHY reveals the far-reaching effects of scientific revolution that is transforming the fields of statistics, epidemiology, cognitive science, and the social sciences, and that will be central to advances in the next generation of artificial intelligence.

In the book, Pearl and Mackenzie explore:

- Why scientists failed for so long to develop a scientific language for expressing cause and effect.
- How over the past decades Pearl and others have developed methods for determining causal relationships, thereby more closely mimicking what the human brain can do.
- How causal models can now be built to answer questions such as
  1) How likely is it that man-made global warming caused this heat wave?
  2) Does this gene cause lung cancer directly or by predisposing people to smoke more?
  3) What is the effect of a job training program on salary?
- The problems with randomized control trials, and how causal models can offer an alternative way of determining cause and effect when such trials are impossible or too expensive.
- How despite the hubbub about Big Data and "deep learning systems," any real advances in artificial intelligence will require us to teach machines to think in terms of cause and effect. Intelligent machines can and should be taught causal reasoning as a prerequisite to ethical behavior and collaboration with humans.

Pearl is a professor of computer science and statistics at UCLA, and the winner of the 2011 Turing Award (the Nobel of computer science). You can read more about his work here and here.

Source: https://www.kdnuggets.com/2018/05/pearl-book-science-cause-effect.html

Judea Pearl (2001): Winner of the A. M. Turnig Award:
> https://amturing.acm.org/award_winners/pearl_2658896.cfm

Judea Pearl's Home page: http://bayes.cs.ucla.edu/jp_home.html

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Publisher summary:

A Turing Prize-winning computer scientist and statistician shows how understanding causality has revolutionized science and will revolutionize artificial intelligence

"Correlation is not causation." This mantra, chanted by scientists for more than a century, has led to a virtual prohibition on causal talk. Today, that taboo is dead. The causal revolution, instigated by Judea Pearl and his colleagues, has cut through a century of confusion and established causality--the study of cause and effect--on a firm scientific basis. His work explains how we can know easy things, like whether it was rain or a sprinkler that made a sidewalk wet; and how to answer hard questions, like whether a drug cured an illness. Pearl's work enables us to know not just whether one thing causes another: it lets us explore the world that is and the worlds that could have been. It shows us the essence of human thought and key to artificial intelligence. Anyone who wants to understand either needs *The Book of Why*.

Editorial Reviews

Review

"Have you ever wondered about the puzzles of correlation and causation? This wonderful book has illuminating answers and it is fun to read."
—Daniel Kahneman, winner of the Nobel Memorial Prize in Economic Sciences and author of Thinking, Fast and Slow

"'Correlation is not causation.' That scientific refrain has had social consequences...Judea Pearl proposes a radical mathematical solution...now bearing fruit in biology, medicine, social science and AI."***—Nature***

"Pearl's accomplishments over the last 30 years have provided the theoretical basis for progress in artificial intelligence... and they have redefined the term 'thinking machine.'"***—Vint Cerf, Chief Internet Evangelist, Google, Inc.***

"Judea Pearl has been the heart and soul of a revolution in artificial intelligence and in computer science more broadly."***—Eric Horvitz, Technical Fellow and Director, Microsoft Research Labs***

"If causation is not correlation, then what is it? Thanks to Judea Pearl's epoch-making research, we now have a precise answer to this question. If you want to understand how the world works, this engrossing and delightful book is the place to start."***—Pedro Domingos, professor of computer science, University of Washington, and author of The Master Algorithm***

Source: https://www.amazon.com/Book-Why-Science-Cause-Effect/dp/046509760X/ref=sr_1_1

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