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The AI delusion

by Gary Smith, USA, Oxford University Press, 2018, $27.95 USA (Hardback) ISBN 978-0-19-882430-5

Krishnendu Sarkar

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BOOK REVIEW

The AI delusion, by Gary Smith, USA, Oxford University Press, 2018, $27.95 USA (Hardback) ISBN 978-0-19-882430-5

The AI Delusion by Gary Smith does not negate the increasing role of Artificial Intelligence (AI) for business and development, as the title of his book might suggest. Rather, it is an engaging discourse on the limits of AI to deliver effective judgments and decisions as good as humans. The proliferation of AI, big data, and machine learning in our daily lives is due to the computer revolution, which is even more life-changing than the industrial-revolution (p. 235). This fact neither makes computers infallible nor helps data miners to discover knowledge (p. 116). Gary Smith's message can best be construed in the quotes from Professor Stephen William Hawking in an interview with BBC in December 2014: "The development of full artificial intelligence could spell the end of the human race" (available at https://www.bbc.com/news/technology-30290540) and Lawrence Edward Page, co–founder of Google, in "The Academy of Achievement" interview, October 2000: "Artificial intelligence would be the ultimate version of Google search engine that would understand everything on the web." (available at https://youtu.be/E96l4aFTgA4). *The AI Delusion* explains why human reasoning should not be imitated by software black boxes that are more trained to understand correlation and not causality. Gary Smith provides plethora of compelling anecdotes of AI gone awry, from US elections to Jeopardy, Board games to medicines, and face-recognition to karaoke.

The book has 12 Chapters. Put together, it offers four major points to anyone who is tempted to think that black box algorithms on vast quantities of data will make useful predictions. First, patterns can be computed in huge quantity of random data, which might not actually lead to any definitive conclusion. Second, correlation is not causation. Third, cherry picking from data sets is dangerous. Fourth, data without theory are treacherous.

Chapter 1, "Intelligent or obedient?," highlights the prowess of computers with various incarnations of Jeopardy games and board games. Computer systems like Watson are astonishingly powerful with searching words, phrases, and patterns from huge data repositories, but they fall short in its understanding on the context-based meanings. AI systems can be obedient but never as intelligent to match with the common sense of human, because human reasoning is fundamentally different from AI. Chapter 2, "Doing without thinking," explores through real instances how humans, unlike computers, can use the familiar to recognize the unfamiliar. AI can do repetitive tasks quickly and reliably but are constrained by its granular approach trying to match individual letters, pixels, and sound waves instead of recognizing and critically thinking about things in the emotional context the way humans do. Chapter 3, "Symbols without context," deals mainly with the basis of AI involving deep neural networks that are inspired by the neurons of the brain to train its system with real-world experience. However, the fact is that there are no significant clues yet on how a human brain works. AI-based *Google Translate* can find words but cannot understand ideas, which makes for distorted translations. AI can be awful at integrative thinking like humans, a big reason why Gary believes that big data and big computers could lead to big trouble. Chapter 4, "Bad data," continues to explore why big data are not always better data with computer's inability to separate or identify bad data. Bad data as input shall always give incorrect outputs. Besides, computers' inabilities to recognize the self-selection biases in the data and statistics would yield different conclusions on the same event. Chapter 5, "Patterns in randomness," examines how data mining is a dangerous form of AI that look for trends, correlations and other patterns in data without preconceived theories or motivation. Furthermore, how data can be "massaged, manipulated, and mangled to mislead" (p. 79) is exemplified with weather forecasting and stock pricing delusion. While much of AI can be wonderful, data mining is not, with its data before or without theory approach. Chapter 6, "If you torture the data long enough," analyses

using succinct instances on AI's endemic problems with "data first, theory later" (p. 95) misplaced logic. AI algorithms can torture data in a variety of ways using various statistical methods to yield patterns without a plausible theory to explain those. The statement, "AI algorithms that mine Big Data are a giant step in the wrong direction" (p. 118) says it all. Chapter 7, "The kitchen sink," recommends multiple regression models for prediction because they take into account the importance of multiple explanatory variables. Based on such variables, though a data mining model, linear or non-linear, can fit data well, still it will fail to ascertain the veracity or relevance of the model against the context. Chapter 8, "Old wine in new bottles," expands on the romanticism of data miners to create beautiful models using stepwise regression, ridge regression, principal components, factor analysis, and neural networks to deal with big data that is far from realism. Chapter 9, "Take two aspirin," can be described in the words: "I don't know why you are ill, but my computer recommends surgery" (p. 150). The moral, especially applied in the area of medical treatments, is that medical advisory computer systems are good at collecting, storing, and retrieving medical data and are bad at distinguishing between causation and coincidence and therefore such systems can lead to impaired medical treatments. Chapter 10 and Chapter 11, "Beat the market I–II," use the vicissitudes in stock market and trading where buyers and sellers are affected by misperceptions, unpredictability and irrationality, to examine why black-box model-based trading systems can often explain the past remarkably and often predict the future miserably. Chapter 12, "We're watching you," paints a disturbing picture of the future with AI and big data, where apparently, if unchecked, machines will dominate over humanity. To prevent such an unwarranted situation, Gary argues that it is better to pull out the smart algorithms from AI's black-boxes and place those under smarter public scrutiny. The argument here is that, unlike humans, AI systems lack in commonsense, intelligence, and emotions to produce real insights. Thus, humans cannot rely on AI to make important decisions on their behalf, or it will have dangerous consequences.

The book should excite the general readers much like the yesteryear book *Future Shock* by Alvin and Heidi Toffler. Not least, in the realm of industry 4.0, the book would provoke educators, learners, researchers, and professionals to realize the future of a cogent human-AI co-existence, which could be divine. Till that time, there will be reasons to admit that AI is a delusion.

Krishnendu Sarkar
NSHM Knowledge Campus, Kolkata, India
krishnendu.sarkar@nshm.com

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