Famous wet raincoat

What the human mind can do that the man-made one can't

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THE MYTH OF ARTIFICIAL INTELLIGENCE
Why computers can't think the way we do
ERIK J. LARSON
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China's first ultra-realistic robot revealed, Hefei, 2016

As technology becomes ever more pervasive in our lives, the audience for conjectures about its future grows, undeterred by the speculative foundations on which such conjectures rest. These foundations are especially flimsy when they include an assumption that the present trajectory of development leads to computers with intelligence equal to that of humans. Even if such computers are possible, it is doubtful that they could be engineered through any refinement of present techniques. In *The Myth of Artificial Intelligence*, Erik J. Larson argues that there is no prospect of overcoming the limitations of those techniques, accuses their champions of being "scientifically and conceptually bankrupt", and suggests that their influence on recent attempts to understand the mind has been "fantastically self-defeating and stupid".

Larson's central chapters concern a problem that can be illustrated with an example from a paper of 1979 by the philosopher John Haugeland: Jones, entering, says: "I left my raincoat in the bathtub because it was wet". Smith effortlessly understands Jones to have said that his raincoat was wet, not that the bathtub was, although his utterance of "it" might grammatically have either referent. How does Smith do this? And how could a computer do it, as it must if it is to engage in normal conversation?

Deductive logic seems not to be the tool for this job. Although computers are exceedingly good at applying deductive rules, those rules can only generate lines of reasoning that are as watertight as mathematical proofs. That is not what is needed here: Jones was *probably* talking about the wetness of his raincoat, but there is no deductive guarantee. Nor is the problem made tractable by finding patterns in large sets of data. Computers are good at that, too, but the statistics may point in the wrong direction: the wetness of bathtubs may have been talked about more frequently than the wetness of raincoats. Moreover, our linguistic capabilities are applicable even when the conversation turns to matters for which we have no data. Smith's understanding of what Jones is talking about seems instead to depend on a capacity for forming and evaluating explanatory hypotheses that draw on a broad knowledge of causal structures and human motivations. Such capacities fall outside the arena in which computers do well. Larson therefore argues that, however good they might be at chess, Go, or the quiz show *Jeopardy!*, a new approach to hypothesis-based thinking will be needed before computers match the degree of intelligence that we display in our most mundane conversations.

The idea that conversation is a more exacting test of intelligence than the playing of games has been present in discussions of Artificial Intelligence from the beginning, having been codified in Alan Turing's proposal that a system's thinking might be tested in a conversation-based Imitation Game. Larson's criticisms of Turing are nonetheless severe. He thinks that, after the success of his code-breaking work, Turing underwent "a radical about face", coming "to believe that all human thought could be understood, in effect, as the 'breaking' of 'codes' – the solving of puzzles – and the playing of a game like chess". Larson calls this "an egregious error". The accusation is unfair. A more charitable and plausible reading is that Turing came to think that computers could model intelligence, not because he adopted an impoverished view of intelligence, but because of his confidence that every physically implementable function is, in principle, computable. In light of his work with Alonzo Church, Turing had good reasons to think that every information-handling process permitted by the laws of nature can by modelled on a computer (albeit slowly), and so to think that a computational model of intelligence could be impossible only if intelligence originates in processes that violate those laws.

At the end of the book, Larson thanks four editors who "made the text better in their way". One might have corrected his use of "datum" as a mass noun, of "supplant" to mean "supplement", and of "enormity" to mean "enormousness", as well as the rendering of 86 billion as "8.6 x 1010", and the claim that the universe is estimated to contain 1,080 atoms. Readers with the interpretative nous that eludes computers will realize that the intended figures are 10^{10} and 10^{80}, but, for those without prior knowledge of the fields that Larson discusses, other slips, such as the erroneous truth table that is given for the material conditional, may create a more obstructive barrier to understanding. ■

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