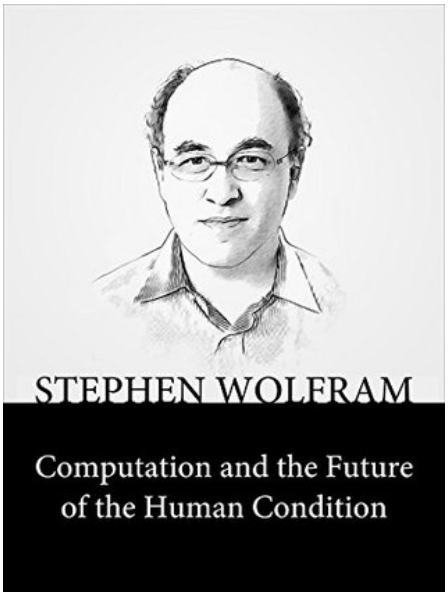

Computation and the Future of the Human Condition

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Stephen Wolfram is the creator of Mathematica and Wolfram|Alpha and the author of *A New Kind of Science* and *An Elementary Introduction to the Wolfram Language*. In this short ebook, Dr. Wolfram dives into his theories of computation and the universe.

Take a look at this short excerpt from the ebook *Computation and the Future of the Human Condition*:

> “In traditional engineering, one starts with some purpose in mind, then explicitly tries to construct a system that achieves that purpose.
>
> And typically at each step one insists on foreseeing what the system will do.
>
> With the result that the system must always be quite computationally reducible.
>
> But in the computational universe there are lots of systems that aren’t computationally reducible.
>
> So can we use these systems for technology?
>
> The answer is absolutely yes.
>
> Sometimes we look at the systems and realize that there’s some purpose for which they can be used.

But more often, we first identify a purpose, and then start searching the computational universe for systems that can achieve that purpose.

Things like this have been done a little in traditional engineering—even, say, with

Edison searching for his light-bulb filaments.

But it’s vastly more efficient and streamlined in the computational universe.

Computation and the Future of the Human Condition Details

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From Reader Review Computation and the Future of the Human Condition for online ebook

Todd Allen says

In this essay, Stephen Wolfram discusses computational irreducibly, cellular automata, and areas relevant to the reach of computation. He references frequently his book A New Kind of Science, and the mathematical computation program Mathematica he is responsible for creating, among other accomplishments. He sprinkles enough of his passion throughout the pages to inspire and motivate one to dig deeper.

Nick Swenson says

Wolfram shares computational ideas

Wolfram takes us through NKS, computational irreducibility and the experimental discovery process now available to us because of our computational systems. Powerful and useful ideas presented in this short book. Recommended.

Mark Barclay says

Very thought provoking. Wolfram's relative "stream of consciousness" writing style used in this book provided a light and casual treatment if some pretty heavy futurism.

Roberto Rigolin F Lopes says

Wolfram is lecturing about his "Galilean" discovery looking at the computational universe (cool analogy, nay?). The whole thing converges to his hypotheses about the future of computation (detailed in A New Kind of Science), which is driven by the evolution of human purposes. This is thrilling because nature is the inspiration but it gets even better because he is doing it Feynman-style! No fancy language, no baloney and having fun. His reasoning may widen your view of the future by sharing intriguing ideas that resembles fractals (but no direct reference).

Santino Maguire says

There's an old warning passed down in STEM circles. Back when the loom was the most advanced machine on the planet, the leading metaphor for how brains worked was as a loom. As telephones began being strung across the country, the this metaphor shifted---now the brain was like a telephone switchboard. These days the brain is like a computer, but I'm reasonably sure it's going to stay a computer. My point is that our familiarities inform the metaphors we use, but it's worth keeping in mind *that these things are just metaphors.*

Wolfram falls victim to this. Not only are brains computers, but they are in fact /computation itself/. Intelligence is merely computation. Weather systems are merely computations. Thus, Wolfram says, weather systems are intelligent too. This is a neat trick of semantics, but it's ultimately useless. The word "intelligence" refers to human-like-things, and not to weather-like-things, regardless of any computational similarities they have under the surface. Wolfram eventually concedes the point, but it left a sour taste in my mouth. If he's going to argue in clear circles like this one, why should I trust his reasoning on other things where I find the causal relationships less clear?

"Everything is computation" is the claim, and Wolfram follows this argument to its limit---that Godelian proofs are thus a limiting factor in every endeavor. We're unable to predict the future because of the halting problem. We're unable to distinguish meaning because doing so is equivalent to solving the halting problem. Et cetera.

This all may be true, but it seems like grasping at straws from a man who has this to say about mathematics: "what I've concluded is that actually the mathematics we have today is really just a historical accident: the direct generalization of the arithmetic and geometry that happened to be used in ancient Babylon. So it's just history that makes the particular axiom systems we're using seem meaningful to us."

Yes, the halting problem is a very real phenomenon, but the vast majority of the time it doesn't strike in full generality; we can often approximate solutions. And, this is all based on the assumption that the universe itself is subject to Curry-Howard. Maybe, but then again the only evidence we have is that there don't appear to be any NP-complete problems in nature.

Computation and the Future of the Human Condition isn't all bad though. It's a short enough read that you can get through it in one sitting, and it'll definitely provoke interesting thoughts. That being said, it's not Wolfram's best work. A better read is his blog post Showing Off to the Universe (http://blog.stephenwolfram.com/2018/0...) which better details his arguments and is free.
