

A New Chapter in Science

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Though we have fared well in uncovering the fundamental rules that guide the flow of energy, we have failed to reason about more complicated elements of nature. In order to make use of the progress of knowledge in physics and fundamental chemistry, we have synthesized our own crude and ideal environments. Our machines are inflexible, simple, and often inefficient. They are corals in water.

But then some naturalists looked at living organisms and dared ponder if they were truly the product of an architect with a level of artistry and engineering which we could never obtain. One of them was Darwin.

He was the first man to find that pure and general principles were not bound to the scale of atoms, planet orbitals, or other simple systems. They could also be found at the scale of life. He did so by uncovering the algorithmic root of all life forms: natural selection. But natural selection is not simply a creator of objects. It creates other algorithms. And it created the most important algorithm, which has not yet been cracked, in the organ which represents the control centre of the body.

And so our task is twofold. We ought both to find the core learning algorithms of the brain and to find more efficient ones. The goal is both to understand key elements of present life forms and to create ones that are on par in terms of flexibility, efficiency, and beauty. In other words, it is still crucial to see where gradient descent can lead despite there being no evidence that it reshapes white matter.

The first technological phase has been to understand the world such that energy can be extracted and transformed in crude ways. The second phase is to both discover (from the brain) and invent learning algorithms which can guide the flow of energy in a much better way than what is presently done.

The physicists have always been the singed heroes of the scientific world. And they have deserved it. They provided us with true general comprehension, rather than a merely more precise and truthful contemplation of some of nature's objects. But in a time which contains embodied Turing machines, synthesizing minds no longer have to limit themselves to the fundamental building blocks of nature. We can go higher up the abstraction chain. Let us show that better can be done than mere stamp collecting. A new technical chapter has begun, of which we are at the forefront.

This scientific challenge requires more than the creation of an algorithm which is efficient in the pursuit of any goal. It ought to be aligned with the preservation of current life forms. Two axes need to be worked on simultaneously, intelligence **and** empathy. Working only on intelligence would be quite foolish, for neither imply the other.