Plato and the Nerd: The Creative Partnership of Humans and Technology

By Edward A. Lee

Popular books about the philosophy of science abound with fascinating topics like what are time, matter, and energy, and how evolution can produce consciousness. But if you look for popular books on philosophy of technology, you find a smattering of treatises on the transition from hunter-gatherers to agrarian societies and on the industrial revolution. My book, *Plato and the Nerd* [3], is about the firestorm of digital, computational technology that is creating artificial intelligences and is changing the nature of work. It is about what is happening to us now.

A key theme in the book is that digital technologies are coevolving with human culture. What is emerging is a symbiosis, where we depend on the technology for survival as much as it depends on us. Technology is not “applied science” and it is driven less by discovery than by quirky creativity. Creativity supplies the random mutation that any evolutionary process requires.

Most car manufacturers today are still putting on our public roads cars that will happily slam into the rear end of the car in front of them and trucks that will drive into crowds of pedestrians. Why? They know how to prevent this, and the cost is modest and dropping fast. Is this a technical problem, a problem in business economics, or a cultural issue involving liability laws and a sense of individual liberty? I believe that the latter dominates. Technology development is deeply intertwined with cultural evolution.

What about the emergence, finally, of useful and effective AI technology? Google, Facebook, Amazon, and Apple, together with many startups and open-source nonprofits, have deployed technologies that make us smarter, more interconnected, and more vulnerable. We carry in our pockets, not our brains, everything that humans have ever published. Wikipedia, rather surprisingly, has turned into collective wisdom, not the anarchist chaos one might have expected. These tools are changing the nature of human thought, not just replacing it with artificial thought.

Are we humans designing these technologies? Are we The Creator? Are the technologies the result of applying the insights of science in a methodological way? Are the innovations primarily scientific discoveries or cultural artifacts? My essential claim is that digital computation has smashed open the range and extent of what we can do with technology, and that the systems emerging are far too complex to be designed in a logical, top-down fashion.

The core of the most disruptive technologies is software. Software has become analogous to a genetic code for a new kind of life on the planet that is coevolving with humans. Wikipedia, for example, has quite a few features of a living thing: it reacts to stimulus from its environment (electrical signals coming in over the network); it operates autonomously (for a while, at least, but it is dependent on us for long term survival); it requires nourishment (electricity from the power grid); it self repairs (vandalism detection, see chapter 1 of *P & N*); and it even dreams (background indexing to facilitate search, see chapter 5 of *P & N*).

For complex digital and computational behaviors, like those in Wikipedia, a banking system, or a smart phone, it is hard to identify any cognitive being that performed anything resembling top-down intelligent design. These systems evolved through the combination of many components and layers of abstraction,
themselves similarly evolved, and decades-long iterative design revisions with many failures and quirky, creative turns along the way. It is classic coevolution, mutation and survival of the fittest, where in Daniel Dennett’s words, “fitness means procreative prowess” [2]. The procreative prowess of software stems from the very concrete benefits it affords to the humans that use it, for example by providing those humans with income.

According to Richard Dawkins [1] and Daniel Dennett [2], human culture evolves in a Darwinian way. The “replicators” of culture are “memes,” ideas and words. But memes do not resemble living beings nearly as much as software does. Software is, in principle, capable of autonomous existence, without humans, a key property that makes AI so scary. But if what emerges is a symbiosis rather than an annihilation, we could all be better off. By any objective measure, software has already made us better off. Cars are safer and more reliable; our financial systems are more efficient; food production and distribution means that we eat better than the king of France used to; our communication systems are spectacularly more ubiquitous; and we have whole new sectors of economic activity centered around information.

Can software supplant us? I show in P & N that the very digital and computational nature of software imposes limitations that may ultimately ensure a unique and vibrant role for humans.

It is nevertheless unsettling that both cultural and technological changes seem to be accelerating. Rapid coevolution is intrinsically unpredictable. And rapid evolution depends on death, the flip side of survival. In our culture, whole careers are dying. And most software dies, having failed to provide sufficient utility to its human symbionts.

The book examines the relationship between engineering and science, themselves coevolving memes. I probe the cultural value system that ranks discovery over invention, and invention over design. I show that while engineers and scientists both develop and use models, they use them in different and complementary ways.

The title, *Plato and the Nerd*, puts into opposition the notion that knowledge, and hence technology, consists of Platonic Ideals that exist independent of humans and is discovered by humans, and an opposing notion that humans create rather than discover knowledge and technology. The nerd in the title is a creative force, subjective and even quirky, and not an objective miner of preexisting truths.

I am not a philosopher, but this is, in a sense, a philosophy book. I meant it to be accessible, but some of my arguments cannot be made without a bit of math. For example, I debunk a popular theory among many scientists today that claim that everything in the physical world is digital and computational, and hence our brains are computers. I show, using a little math, that this is not a scientific thesis (it is not falsifiable). It can only be taken on faith, and there is little justification for this faith.

Despite the math, I have tried to make the book readable and interesting to both numerate humanists and literate technologists, but it is my first attempt at such a book, perhaps even the first attempt at such a book. I therefore apologize to my readers for the places in the book where I failed. I hope you will skip ahead if you get bogged down, because the story evolves to the end, where I hope to show you that there is no end in sight.

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References