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THE SATURDAY ESSAY

The Human Promise of the AI Revolution

Artificial intelligence will radically disrupt the world of work, but the right policy choices can make it a force for a more compassionate social contract.

By Kai-Fu Lee

Sept. 14, 2018 10:25 a.m. ET

Artificial intelligence is a technology that sparks the human imagination. What will our future look like as we come to share the earth with intelligent machines? Our minds gravitate to extremes, to the sharply contrasting visions that have captured public attention and divided much of the technological community. As a longtime AI researcher and venture capitalist in China and the U.S., I've observed these two camps across continents and over many decades.

Utopians believe that once AI far surpasses human intelligence, it will provide us with near-magical tools for alleviating suffering and realizing human potential. In this vision, super-intelligent AI systems will so deeply understand the universe that they will act as omnipotent oracles, answering humanity's most vexing questions and conjuring brilliant solutions to problems such as disease and climate change.

But not everyone is so optimistic. The best-known member of the dystopian camp is the technology entrepreneur Elon Musk, who has called super-intelligent AI systems "the biggest risk we face as a civilization," comparing their creation to "summoning the demon." This group warns that when humans create self-improving AI programs whose intellect dwarfs our own, we will lose the ability to understand or control them.

Which vision to accept? I'd say neither. They simply aren't possible based on the technology we have today or any breakthroughs that might be around the corner. Both scenarios would require "artificial general intelligence"—that is, AI systems that can handle the incredible diversity of tasks done by the human brain. Making this jump would require several fundamental scientific breakthroughs, each of which may take many decades, if not centuries.

The real battles that lie ahead will lack the apocalyptic drama of Hollywood blockbusters, but they will disrupt the structure of our economic and political systems all the same. Looming

before us in the coming decades is an AI-driven crisis of jobs, inequality and meaning. The new technology will wipe out a huge portion of work as we've known it, dramatically widening the wealth gap and posing a challenge to the human dignity of us all.

This unprecedented disruption requires no new scientific breakthroughs in AI, just the application of existing technology to new problems. It will hit many white-collar professionals just as hard as it hits blue-collar factory workers.

Despite these immense challenges, I remain hopeful. If handled with care and foresight, this AI crisis could present an opportunity for us to redirect our energy as a society to more human pursuits: to taking care of each other and our communities. To have any chance of forging that future, we must first understand the economic gauntlet that we are about to pass through.

Many techno-optimists and historians would argue that productivity gains from new technology almost always produce benefits throughout the economy, creating more jobs and prosperity than before. But not all inventions are created equal. Some changes replace one kind of labor (the calculator), and some disrupt a whole industry (the cotton gin). Then there are technological changes on a grander scale. These don't merely affect one task or one industry but drive changes across hundreds of them. In the past three centuries, we've only really seen three such inventions: the steam engine, electrification and information technology.



"Han," a humanoid robot developed by Hanson Robotics. PHOTO: ISAAC LAWRENCE/GETTY IMAGES

Looking at this smaller data set, we have a mixed bag of economic impacts. The steam engine and electrification created more jobs than they destroyed, in part by breaking down the work of one craftsman into simpler tasks

done by dozens of factory workers. But information technology (and the associated automation of factories) is often cited by economists as a prime culprit in the loss of U.S. factory jobs and widening income inequality.

The AI revolution will be of the magnitude of the Industrial Revolution—but probably larger and definitely faster. Where the steam engine only took over physical labor, AI can perform both intellectual and physical labor. And where the Industrial Revolution took centuries to spread beyond Europe and the U.S., AI applications are already being adopted simultaneously all across the world.

AI's main advantage over humans lies in its ability to detect incredibly subtle patterns within large quantities of data and to learn from them. While a human mortgage officer will look at only a few relatively crude measures when deciding whether to grant you a loan (your credit score, income and age), an AI algorithm will learn from thousands of lesser variables (what web browser you use, how often you buy groceries, etc.). Taken alone, the predictive power of each

of these is minuscule, but added together, they yield a far more accurate prediction than the most discerning people are capable of.

For cognitive tasks, this ability to learn means that computers are no longer limited to simply carrying out a rote set of instructions written by humans. Instead, they can continuously learn from new data and perform better than their human programmers. For physical tasks, robots are no longer limited to repeating one set of actions (automation) but instead can chart new paths based on the visual and sensor data they take in (autonomy).

Together, this allows AI to take over countless tasks across society: driving a car, diagnosing a disease or providing customer support. AI's superhuman performance of these tasks will lead to massive increases in productivity. According to a June 2017 study by the consulting firm PwC, AI's advance will generate \$15.7 trillion in additional wealth for the world by 2030. This is great news for those with access to large amounts of capital and data. It's very bad news for anyone who earns their living doing soon-to-be-replaced jobs.

There are, however, limits to the abilities of today's AI, and those limits hint at a hopeful path forward. While AI is great at optimizing for a highly narrow objective, it is unable to choose its own goals or to think creatively. And while AI is superhuman in the coldblooded world of numbers and data, it lacks social skills or empathy—the ability to make another person feel understood and cared for. Analogously, in the world of robotics, AI is able to handle many crude tasks like stocking goods or driving cars, but it lacks the delicate dexterity needed to care for an elderly person or infant.

What does that mean for workers who fear being replaced? Jobs that are asocial and repetitive, such as fast-food preparers or insurance adjusters, are likely to be taken over in their entirety. For jobs that are repetitive but social, such as bartenders and doctors, many of the core tasks will be done by AI, but there remains an interactive component that people will continue to perform. The jobs that will be safe, at least for now, are those well beyond the reach of AI's capabilities in terms of creativity, strategy and sociability, from social workers to CEOs.

Even where AI doesn't destroy jobs outright, however, it will exacerbate inequality. AI is inherently monopolistic: A company with more data and better algorithms will gain ever more users and data. This self-reinforcing cycle will lead to winner-take-all markets, with one company making massive profits while its rivals languish.

A similar consolidation will occur across professions. The jobs that will remain relatively insulated from AI fall on opposite ends of the income spectrum. CEOs, home care nurses, attorneys and hairstylists are all in "safe" professions, but the people in some of these professions will be swimming in the riches of the AI revolution while others compete against a vast pool of desperate fellow workers.

WSJ D.LIVE

- Kai-Fu Lee will appear at The Wall Street Journal's global tech conference, D.Live, Nov. 12-14 in Laguna Beach, Calif. See more details [here](#).

We can't know the precise shape and speed of AI's

impact on jobs, but the broader picture is clear. This will not be the normal churn of

capitalism's creative destruction, a process that inevitably arrives at a new equilibrium of more jobs, higher wages and better quality of life for all. Many of the free market's self-correcting mechanisms will break down in an AI economy. The 21st century may bring a new caste system, split into a plutocratic AI elite and the powerless struggling masses.

Recent history has shown us just how fragile our political institutions and social fabric can be in the face of disruptive change. If we allow AI economics to run their natural course, the geopolitical tumult of recent years will look like child's play.

On a personal and psychological level, the wounds could be even deeper. Society has trained most of us to tie our personal worth to the pursuit of work and success. In the coming years, people will watch algorithms and robots easily outmaneuver them at tasks they've spent a lifetime mastering. I fear that this will lead to a crushing feeling of futility and obsolescence. At worst, it will lead people to question their own worth and what it means to be human.

So what can be done?

This grim vision is shared by many technologists in Silicon Valley, and it has sent them casting about for solutions. As the architects and profiteers of the AI age, they feel a mix of genuine social responsibility and fear of being targeted when the pitchforks come out. In their rush for a quick fix, many of the techno-elite have seized on the idea of a universal basic income: an unconditional, government-provided cash stipend to allow every citizen to meet their basic needs.

I can see the appeal. UBI is exactly what Silicon Valley entrepreneurs love: an elegant technical solution to tangled social problems. UBI can be the magic wand that lets them wish away the messy complexities of human psychology and get back to building the technologies that "make the world a better place," while making them rich. It's an approach that maps well onto how they tend to view society: as a collection of "users" rather than as citizens, customers and human beings.

We can do better. Some form of guaranteed income may indeed be necessary, but if we allow such support to be the endgame, we will miss the opportunity presented by this transformative technology. Instead of simply falling back on an economic painkiller like a universal basic income, we should use the economic bounty generated by AI to double down on what separates us from machines: human empathy and love.

Such a revolution in how we relate to work will require a rethink from all corners of society. In the private sector, instead of simply viewing AI as a means for cost-cutting through automation, businesses can create new jobs by seeking out symbiosis between AI optimizations and the human touch. This will be especially powerful in areas such as health care and education, where AI can produce crucial insights but only humans can deliver them with care and compassion.

Beyond the private sector, governments across the world need to start thinking now about how to use the riches generated by AI to rewrite the social contract and reorient our economies to promoting human flourishing.

At the center of this vision, I would suggest, there needs to be what I call the Social Investment Stipend, a respectable government salary for those who devote their time to three categories of activities: care work, community service and education. These activities would form the pillars



“Pepper,” a robot manufactured by SoftBank Robotics, is designed to interact with human beings. PHOTO: GETTY IMAGES

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y beneficial activities just as we now reward economically productive activities. The idea is simple: to inject more ambition, pride and dignity into work focused on enhancing our communities.

Care work could include parenting or home schooling of young children, assisting aging parents or helping a friend with mental or physical disabilities live life to the full. Service work would focus on much of the current work of nonprofit and volunteer groups: leading after-school programs, guiding tours at parks or collecting oral histories from elders in our communities. Supported education activities could range from professional training for the jobs of the AI age to taking classes that turn a hobby into a career.

The participation requirements of the stipend wouldn’t be designed to dictate the lives of citizens. There would be a wide enough range of choices for all workers who have been displaced by AI. The more people-oriented could opt for care work, the ambitious could enroll in high-tech training, and others could take up community-service work.

By requiring some social contribution to receive the stipend, we would foster a public philosophy far different from the laissez-faire individualism of universal basic income. Providing a stipend in exchange for participation in community-building activities carries a clear message: Collective effort from people across society allowed us to reach this point of economic abundance, and now we must use that abundance to recommit ourselves to one another and to our humanity.

Many difficult questions remain to be answered, of course, before we could consider implementing such a sweeping and idealistic policy. The urgency to create, and the ability to pay for, a far-reaching Social Investment Stipend will depend on the pace and nature of AI’s economic impact. But the humanistic values it embodies can serve as a guide while we navigate the treacherous waters that lie ahead. We may yet be able to harness the full potential of both machines that think and humans who love.

—This essay is adapted from Dr. Lee’s new book, “AI Superpowers: China, Silicon Valley and the New World Order,” which will be published by Houghton Mifflin Harcourt on Sept. 25. He is the Chairman and CEO of Sinovation Ventures and the former president of Google China.

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