ON TECH: A.I. NEWSLETTER

What's the Future for A.I.?

Where we're heading tomorrow, next year and beyond.

By **Cade Metz**

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In today's A.I. newsletter, the last in our five-part series, I look at where artificial intelligence may be headed in the years to come.

In early March, I visited OpenAI's San Francisco offices for an early look at GPT-4, a new version of the technology that underpins its ChatGPT chatbot. The most eye-popping moment arrived when Greg Brockman, OpenAI's president and co-founder, showed off a feature that is still unavailable to the public: He gave the bot a photograph from the Hubble Space Telescope and asked it to describe the image "in painstaking detail."

The description was completely accurate, right down to the strange white line created by a satellite streaking across the heavens. This is one look at the future of chatbots and other A.I. technologies: A new wave of **multimodal systems** will juggle images, sounds and videos as well as text.

Yesterday, my colleague Kevin Roose told you about what A.I. can do now. I'm going to focus on the opportunities and upheavals to come as it gains abilities and skills.

A.I. in the near term

Generative A.I.s can already answer questions, write poetry, generate computer code and carry on conversations. As "chatbot" suggests, they are first being rolled out in conversational formats like ChatGPT and Bing.

But that's not going to last long. Microsoft and Google have already announced plans to incorporate these A.I. technologies into their products. You'll be able to use them to write a rough draft of an email, automatically summarize a meeting and pull off many other cool tricks.

OpenAI also offers an A.P.I., or application programming interface, that other tech companies can use to plug GPT-4 into their apps and products. And it has created a series of plug-ins from companies like Instacart, Expedia and Wolfram Alpha that expand ChatGPT's abilities.

Human-performed jobs could disappear from audio-to-text transcription and translation. In the legal field, GPT-4 is already proficient enough to ace the bar exam, and the accounting firm PricewaterhouseCoopers plans to roll out an OpenAI-powered legal chatbot to its staff.

At the same time, companies like OpenAI, Google and Meta are building systems that let you instantly generate images and videos simply by describing what you want to see.

Other companies are building bots that can actually use websites and software applications as a human does. In the next stage of the technology, A.I. systems could shop online for your Christmas presents, hire people to do small jobs around the house and track your monthly expenses.

All that is a lot to think about. But the biggest issue may be this: Before we have a chance to grasp how these systems will affect the world, they will get even more powerful.

A.I. in the long term

For companies like OpenAI and DeepMind, a lab that's owned by Google's parent company, the plan is to push this technology as far as it will go. They hope to eventually build what researchers call **artificial general intelligence**, or A.G.I. — a machine that can do anything the human brain can do.

A.I. in the medium term

Many experts believe A.I. will make some workers, including doctors, lawyers and computer programmers, more productive than ever. They also believe some workers will be replaced.

"This will affect tasks that are more repetitive, more formulaic, more generic," said Zachary Lipton, a professor at Carnegie Mellon who specializes in artificial intelligence and its impact on society. "This can liberate some people who are not good at repetitive tasks. At the same time, there is a threat to people who specialize in the repetitive part."

As Sam Altman, OpenAI's chief executive, told me three years ago: "My goal is to build broadly beneficial A.G.I. I also understand this sounds ridiculous." Today, it sounds less ridiculous. But it is still easier said than done.

For an A.I. to become an A.G.I., it will require an understanding of the physical world writ large. And it is not clear whether systems can learn to mimic the length and breadth of human reasoning and common sense using the methods that have produced technologies like GPT-4. New breakthroughs will probably be necessary.

The question is, do we really want artificial intelligence to become that powerful? A very important related question: Is there any way to stop it from happening?

The risks of A.I.

Many A.I. executives believe the technologies they are creating will improve our lives. But some have been warning for decades about a darker scenario, where our creations don't always do what we want them to do, or they follow our instructions in unpredictable ways, with potentially dire consequences.

A.I. experts talk about "**alignment**" — that is, making sure A.I. systems are in line with human values and goals.

[Before GPT-4 was released](), OpenAI handed it over to an outside group to imagine and test dangerous uses of the chatbot.

The group found that the system was able to hire a human online to defeat a Captcha test. When the human asked if it was "a robot," the system, unprompted by the testers, lied and said it was a person with a visual impairment.

Testers also showed that the system could be coaxed into suggesting how to buy illegal firearms online and into describing ways to make dangerous substances from household items. After changes by OpenAI, the system no longer does these things.

But it's impossible to eliminate all potential misuses. As a system like this learns from data, it develops skills that its creators never expected. It is hard to know how things might go wrong after millions of people start using it.

"Every time we make a new A.I. system, we are unable to fully characterize all its capabilities and all of its safety problems — and this problem is getting worse over time rather than better," said Jack Clark, a founder and the head of policy of Anthropic, a San Francisco start-up building this same kind of technology.

And OpenAI and giants like Google are hardly the only ones exploring this technology. The basic methods used to build these systems are widely understood, and other companies, countries, research labs and bad actors may be less careful.

The remedies for A.I.

Ultimately, keeping a lid on dangerous A.I. technology will require far-reaching oversight. But experts are not optimistic.

"We need a regulatory system that is international," said Aviv Ovadya, a researcher at the Berkman Klein Center for Internet & Society at Harvard who helped test GPT-4 before its release. "But I do not see our existing government institutions being about to navigate this at the rate that is necessary."

As we told you earlier this week, more than 1,000 technology leaders and researchers, including Elon Musk, have [urged artificial intelligence labs to pause development of the most advanced systems](), warning in an open letter that A.I. tools present "profound risks to society and humanity."

A.I. developers are "locked in an out-of-control race to develop and deploy ever more powerful digital minds that no one — not even their creators — can understand, predict or reliably control," according to the letter.

Some experts are mostly concerned about near-term dangers, including the spread of disinformation and the risk that people would rely on these systems for inaccurate or harmful medical and emotional advice.

But other critics are part of a vast and influential online community called rationalists or effective altruists, who believe that A.I could eventually destroy humanity. This mind-set is reflected in the letter.

Please share your thoughts and feedback on our On Tech: A.I. series [by taking this brief survey.](#)

What if Everyone Did Something to Slow Climate Change?

Researchers are looking at the impact that individuals' actions can have on reducing carbon emissions — and the best ways to get people to adopt them.

By **Alina Tugend**
Sept. 25, 2024

Make more beef-free meals. Compost food scraps. Replace a natural gas stove with an electric one.

These are all fairly simple ways people can help combat climate change in their own kitchens. Still, most Americans don't do it. Why?

Because it means changing lifelong habits. Because they believe it won't make a difference. Because they think their friends and neighbors aren't doing it.

Research shows that it is not easy to motivate people to curb their emissions, but some strategies do work, and experts are trying to identify the best ones.

Magnus Bergquist, an associate professor of psychology at the University of Gothenburg in Sweden, said widespread behavior transformation is difficult, as people often have contradictory goals. For example, changing habits or buying energy-efficient products, "can conflict with people's goals of seeking comfort, saving money and gaining social acceptance," he said in a video interview.

Even those with the best intentions can run up against such conflicts. Leah Murphy, 63, of New Paltz, N.Y., said she recycles, has reduced her use of plastic, shops with canvas bags and has installed energy-efficient lightbulbs, among other efforts.

Nonetheless, "over 30 years ago, when my first child was born, I arranged for a diaper service because it was supposed to be better for the environment," Ms. Murphy said in an interview. Yet there were still a lot of diapers to wash, and after six weeks, she switched to disposable diapers.

"I told myself that the energy used to wash cloth diapers was probably just as bad for the environment as disposables," she said. "That experience represents the start of a long series of rationalizations between convenience and conscience -- more often than not, with convenience prevailing."

At the same time, there is concern that promoting personal solutions to address global climate change lets corporations and governments off the hook and even plays into their hands. For example, a carbon footprint calculator was created by the oil and gas company BP in 2004 as part of an advertising campaign to help people measure their impact on the environment. Critics said it was simply a way to shift the responsibility from big companies to everyday consumers.

But it's wrong to look at solutions to the vast issue of climate change as solely good or bad, said Anthony Leiserowitz, director of the Yale Program on Climate Change Communication, which researches the public's knowledge, attitudes, behavior and policy preferences on climate change.

BP did create the calculator "as a way to put the onus on individual consumers, but it's still valuable as a basic concept to say, 'well, if you really do want to reduce your own emissions, shouldn't you probably start with an estimate of how much you're emitting?'" he said in a video interview. "Both can be true."

According to the organization Project Drawdown, which advances climate solutions, individual and household actions taken together — from reducing food waste to installing LED lighting — have the potential to produce about 25 percent to 30 percent of the reductions in greenhouse emissions needed to avoid the extremely dangerous aspects of climate change.

Take eating beef. Cows, and to a lesser extent goats and sheep, are significant contributors to greenhouse gases through the methane they emit from gas and manure. And cows' pastures are typically created by cutting down forests, which releases the carbon dioxide stored in trees.

But according to the World Resource Institute, a research organization, if each person living in high beef-consuming countries — like the United States — ate 1.5 fewer burgers a week, the

need for agricultural expansion and deforestation would be eliminated and greenhouse gases significantly reduced.

Still, modifying even such seemingly minor behavior is difficult. Since the 1970s, overall beef consumption in the U.S. has droppedconsiderably, because of the climate, as well as health and animal welfare concerns. But it needs to decrease substantially more to address climate change. Instead, it slightly increased in 2022 to the highest in more than a decade.

It's not clear why, but it's an example of how hard it is to induce change.

"Some people have the naïve idea that if we just educate people, change will follow," Professor Bergquist said. "But it doesn't take much to understand that we know we should exercise more; we know that we should eat more healthy; but we don't do it. So, knowledge is a necessary but insufficient factor. On top of that, we need motivation."

He coauthored an analysis of data from 430 primary studies of strategies to improve environmental-related behavior, such as recycling or biking or walking instead of driving.

Of six interventions to change people's behaviors, the study found, providing data or information was the least successful, while financial incentives like rebates, coupons and fines can make a difference.

But research has also found that social comparisons — what are my friends and neighbors doing? — had the biggest effect: When customers were told how their utility use compared to their neighbors', the higher users often decreased their consumption by one to two percent. And with solar panels, people are persuaded to install them if they see them on their neighbors' rooftops.

Mr. Leiserowitz said he witnessed that in his own neighborhood. "We were the first to put solar panels on a roof 10 years ago, and now there are dozens that have solar panels on the roof," he said. "It's not because I went out talking to people about it — it's because people can see that somebody else who's much like them has adopted this new technology."

But collective changes, from reducing littering to wearing seatbelts to drinking less alcohol, often evolve gradually. It took many years and numerous initiatives to reduce smoking, for example. That included more education about the dangers, restrictions on smoking in public areas, prohibitive taxes on cigarettes, public stigma and greater access to programs that helped people quit.

"Changes are slow and hard to see — but when you look backward you see that things that seemed outlandish are increasingly commonplace," said Jason Mark, the editor in chief of Sierra Magazine, in a video interview.

A 2019 report by Rare, a 50-year-old global nonprofit that uses behavioral insights to encourage action to protect the environment, examined seven personal choices and their impact on climate change: switching to an electric vehicle, reducing air travel, eating a plant-rich diet, offsetting carbon, reducing food waste, tending carbon-sequestering soil and purchasing green energy.

The report found that if one in 10 people in each category adopted a reduction behavior, total U.S. global greenhouse emissions would decrease by eight percent. That would shrink by 80 percent the projected gap between what the U.S. has promised in the Paris Agreement — the international treaty on climate that took effect in 2016 — and where it is now, the report stated.

Genevieve Guenther, the author of "The Language of Climate Politics," emphasized that not all people are equally responsible for climate change. According to a report by the nongovernmental organization Oxfam International, the top 1 percent in income worldwide account for more carbon emissions than the poorest 66 percent. In the United States, a study by PLOS Climate found, 10 percent of the richest Americans account for about 40 percent of greenhouse gas emissions.

Political actions, such as voting and pressuring elected officials, can help, Ms. Guenther said in a video interview.

"Our true responsibility is to use our choices as political agents in the world to try to shift power, take power away from the people who are blocking the transition away from fossil fuels and give it to people who will lead into a livable future," she said.

Global Issues Are Taking a Major Toll on Young People's Mental Health

Economic, climate and technology woes are weighing on young adults, a report finds. It recommends overhauling how we approach mental health care.

By **Christina Caron**

Published Aug. 13, 2024Updated Aug. 19, 2024

Chloé Johnson, 22, has been feeling hopeless lately.

She's struggling to focus on classes at her local community college in Dallas while also working full-time, making $18 an hour as a receptionist.

Her car broke down, so the $500 that she had managed to save will now go toward a down payment for a used vehicle.

And she was recently passed over for a promotion.

"Right now it just feels, like, very suffocating to be in this position," said Ms. Johnson, who was diagnosed last year with bipolar II disorder, depression and A.D.H.D. "I'm not getting anywhere or making any progress."

It's an endless loop: Ms. Johnson's mental health has worsened because of her financial difficulties and her financial problems have grown, partly because of the cost of mental health treatment but also because her disorders have made it more difficult to earn a college degree that could lead to a more lucrative job.

"I've failed several classes," she said. "I burn out really easily, so I just give up."

The mental health of adolescents and young adults has been on the decline and it's partly because of "harmful megatrends" like financial inequality, according to a new report published on Tuesday in the scientific journal The Lancet Psychiatry. The global trends affecting younger generations also include wage theft, unregulated social media, job insecurity and climate change, all of which are creating "a bleak present and future for young people in many countries," according to the authors.

Why focus on global trends?

The report was produced over the course of five years by a commission of more than 50 people, including mental health and economic policy experts from several continents and young peoplewho have experienced mental illness.

The authors argue that mental health is not merely an individual issue to be tackled after someone becomes unwell; it is also necessary to focus collectively on the environmental, social, economic, political and technological changes that contribute to mental distress.

While the "megatrends" identified in the report have been around for decades, the authors argue that they have worsened.

"We need to rapidly invest in early intervention" as well as new treatments and new ways of caring for people, said Dr. Patrick McGorry, the lead author of the report and a psychiatrist in Australia. "If young people end up dying, on welfare or even just underachieving in large numbers, then social cohesion and productivity are seriously affected. That is happening now."

Financial and environmental worries weigh heavily on young people.

While research and public discourse tends to focus on the potential negative effects of social media and screen time, the report's authors emphasized that economic and environmental factors can also play a large role in the decline of youth mental health.

According to the Lancet commission, economic trends of the last two decades have contributed to problems like rising student debt, disparities in wealth between the older and younger generations and the difficulty in both finding and keeping a job.

Young adults like Ms. Johnson have been reporting higher stress levels than older generations, according to a 2023 survey from the American Psychological Association. The survey found that people between ages 18 and 34 are more likely than older adults to report that they feel "consumed" by their worries about money.

Climate worry is also becoming a more common complaint. Online searches [for subjects related to climate anxiety](#) have surged. Professionals have created [peer support groups](#), an [online directory](#) of climate-aware therapists, and certification programs in climate psychology.

Michael, 38, who is using his middle name to protect his privacy, said that his [anxiety over the state of the environment](#) began when he was in his early 30s and he has since sought therapy to treat it.

"It seems like there's no care whatsoever for the world around us," said Michael, who lives in Baltimore. Small things, like seeing fleets of trucks delivering items to people's homes or trash in the waterways, make him feel angry or fearful about the future. The "reckless abandon" is "very hard to deal with," he added.

The old approach isn't working, experts say.

The commission's decision to focus on the societal changes that contribute to mental health problems signals a paradigm shift in the field, said Dr. Lisa Fortuna, chair of the American Psychiatric Association's council on children, adolescents and their families.

While it is important to make sure that an individual's mental health needs are addressed, psychiatrists and other mental health practitioners are increasingly recognizing the importance of stepping back to look at the broader problems that affect people, including racism, income inequality and barriers to accessing mental health services, added Dr. Fortuna, who was not part of the Lancet commission.

The new report offers multiple suggestions, including additional public funding toward youth mental health, improved housing and rental affordability and accessible educational opportunities. The authors also emphasized the need to provide continuity of mental health care between the ages of 12 to 25 as patients transition into adult services upon turning 18.

"They were 17 yesterday. They're 18 today, but they're not that different," Dr. Fortuna said. It's a "very vulnerable age," and teenagers can benefit from sticking with a provider who has a deep understanding of that stage of development, she added.

Other priorities include the need to develop mental health services that are sensitive to a client's cultural identity and asking young people who have experienced mental illness to partner with the organizations that aim to help them.

The data clearly points "to an increasingly sick society," Dr. McGorry said. "No one could claim to be in the dark anymore."