The Most Transformative Technology of the Year
By
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I have been speaking enthusiastically about technology from my pulpit for more than twenty years, ever since reading Frank Tipler's 1994 book, *The Physics of Immortality*, in which he writes positively about the people of the future, whom he describes as robots but our descendants, nonetheless. "Many humans," he says, "regard the creation of such people —I call intelligent robots 'people' because that is what they are—with horror, and initially feel that the creation and reproduction of such machine 'people' should be prohibited by law."[1] I, on the other hand, fell immediately in love these people and my very first sermon on the subject was written for them, entitled "A letter to the Far Future."

> My Dear Children, I am writing you from the long, long ago past … I call you 'children' as a sign of my deep affection and hopes for you, not because I feel I am somehow superior to you.

I still feel this way about our non-organic descendants, although I no longer believe they will arrive centuries from now but within my own lifetime. I came to this conclusion upon reading futurist Ray Kurzweil's 2005 book, *The Singularity is Near* and became aware of his "law of accelerating returns," based upon the exponential advancement of technology, especially computer technology. To give an example, if you stack 50 sheets of paper, you have less than half an inch worth. But if you could fold one piece of paper 50 times, doubling its thickness which each fold, it would go past the Sun at 50 folds (93 million miles away). This principle has allowed Kurzweil to make accurate predictions about the advancements of technology, including his prediction that the technological singularity will arrive between 2040 and 2045, only fifteen to twenty years away. The Singularity is the point when technology is evolving so fast that we can no longer use the mathematical law of accelerating returns to predict what happens. There will be new breakthroughs every moment.

While attending Singularity University in 2018, which was co-founded by Ray Kurzweil and entrepreneur, physician, and philanthropist Peter Diamandis, I realized we are living in an era of exponential change, which, as creatures of habit, makes us anxious and upset, which for me, explains much of the turmoil and incivility in the world today. So, it has been part of my mission ever since to help ease our technological anxieties by helping us to better cope with rapid change and to prepare for what's ahead.

Just this week, during his *Moonshots* podcast, Peter Diamendis asked his cohorts to predict what Thanksgiving will be like in 2035. Salim Ismail, founder of OpenEx0 and author of *Exponential Organizations,* said, "By that point we should have the cost of Thanksgiving dinner dropping by 10x. It should be personalized to you, to your nutrition, depending on

your metabolism … We should have ultra-cheap energy, ultra-cheap food, and we're crossing right into the Alex Rubicon [the point of no return].

Diamandis himself quipped, "And we'll have Tesla bots serving us everything."

Alexander Wissner-Gross, a fellow at the Institute for Applied Computational Science at Harvard University, responded, "I think if we don't have at least some subset of humanity celebrating Thanksgiving on Mars; some subset of humanity celebrating Thanksgiving in the cloud in the form of uploaded humans, and maybe we have some uplifted non-human animals also celebrating with us at the table, then something has gone terribly wrong."

And genius Emad Mostaque, founder of Intelligent Internet and author of *The Last Economy*, said, "Ten years is the pessimistic end of the [Artificial General Intelligence] forecast … Mathematics should be solved by then, science, etc. So, you're in the post-abundance world hopefully with the robots and more. There should be a lot to be thankful about if we can navigate what's coming."

These are four experts speaking very seriously about changes that right now seem unimaginable—affordable everything, humans on Mars, intelligent robots—happening just a few years from now. If they are right, this means the floodgates of change and transformation are opening right now. Like them, I'm optimistic about this transformation but am well aware that ours is the minority opinion. As authors Reid Hoffman and Greg Beato point out in, *Superagency: What Can Possibly Go Right with Our AI Future,* people have always felt threatened by new technologies.

The printing press was said to spread heresy and misinformation and undermine experts and authorities. They forewarned that the telephone would erode the intimacy of in-person relationships. The automobile was blamed for weakening families by encouraging consumerism and distracting men from marriage and responsibility. Early workplace automation and computers were predicted to create a permanent class of unemployed people and threatened privacy, free will, and our ability to shape our own lives. Again and again, each innovation arrived with dire predictions that proved far more dramatic than the reality. And there are plenty of people today talking about how alarmed we ought to be about today's most transformative technologies. So, I'll leave such concerns for the seeming majority to espouse while I tell the optimist side of the story, including what I consider to be the most transformative technologies of the year, which I've been doing annually since 2021.

Those on my list aren't in any particular order, so I'll begin with **autonomous vehicles**. The California based company Waymo hit a milestone this year providing more than 250,000 fully autonomous rides per week—and is expanding service across multiple U.S. cities, including launching freeway-capable robotaxis.[2] Meanwhile, startups like Tensor in San Francisco are preparing to sell the first consumer-ready self-driving "robocars" next year,

meaning private ownership of truly autonomous vehicles is on its way.[3] At the same time, the long-awaited "flying car" revolution is gaining serious momentum. Companies such as Joby Aviation and Archer Aviation are actively testing electric vertical-takeoff and landing (eVTOL) aircraft designed for urban air mobility; Joby aims for fast air-taxi service, while Archer recently acquired airport access to support its own fleet development.[4] Across the globe, firms like Xpeng AeroHT in China are building "flying-car + road-car" hybrids—some of which are already in early production.[5]

Here's the Positives: As autonomous cars enter our everyday use, we will see fewer accidents, as the data already indicates, less congestion, and greater mobility for people who can't or don't want to drive. This means as we age, we won't have to give up our independence when we give up driver's license. With flying cars coming on the scene, we're also on the verge of a transportation revolution where "getting around" includes going vertical. This will reshape cities, commute times, land use, infrastructure planning, possibly even how we think about work, housing, and daily geography. Imagine not needing parking lots or garages or owning personal vehicles that sit around unused over ninety percent of the time. Soon, far fewer vehicles that are always on the move will simply come and pick us up whenever we need them to.

Closely related to autonomous vehicles are advances in **humanoid robots and physical-AI** systems that have begun transitioning from research prototypes into deployable machines, a market that is expected to reach more than $50-billion by 2035.[6] Companies including NVIDIA, Tesla, Boston Dynamics, Figure AI, and Neura Robotics are investing heavily in robots that can navigate, manipulate objects, and operate in human-designed environments, including factories, warehouses, and in our homes.[7] Some of these robots, like Figure AI are designed to learn how to do general tasks by watching humans. Imagine having a robot helper in the house that you can teach to load the dishwasher, do the laundry, organize items, cook, and even some maintenance and repair work. Beyond humanoid robots, we're moving into an age where everything is imbued with intelligence, smart stoplights that can communicate with each other and adjust themselves in real time according to the flow of traffic. Then again, who needs stoplights if our autonomous cars are talking with each other?

Here's the Positives: Embodied AI and humanoid robots promise automation of work that was previously considered too complex or dangerous for humans. This will change the economic landscape: tasks from manufacturing, to logistics, to everyday labor could be transformed or replaced. For individuals, it might free humans from repetitive, dangerous, or demeaning jobs, and open space for creativity, care, innovation, and increased productivity. On a societal level, it challenges us to rethink employment, education, and the value of labor in a world where robots are reliable, scalable, and cheap. Although we fear

mass unemployment, history has shown technologies that make our work easier only increase productivity and jobs.

This is a nice segue to BCI—**Brain Computer Interface**. Rather than using an app on our smart device to summon a ride, we just think about it and, *voila*, it's on its way. If this sounds like magic, the field of brain–computer interfaces took a major step forward in 2025. A team at UC Davis Neuroprosthetics Lab announced a BCI that translates brain signals into speech with up to 97% accuracy, offering new hope to people who have lost the ability to speak due to paralysis or diseases like ALS.[8] Meanwhile companies such as Precision Neuroscience received regulatory clearance (in the U.S.) for a minimally invasive cortical interface. Their 1,024-microelectrode array can record rich neural data without open-skull surgery, making BCI significantly more accessible and lower-risk.[9] Then there's Elon Musk's company NeuraLink, which performed its first BCI implant surgery in 2024, giving a completely paralyzed man the ability to control a computer with his thoughts. Today, just a year later, the company has performed more than a dozen such surgeries. In case you missed it, 19-year-old media star Tilly Lockey, who lost both hands as a toddler, has been fitted with the most advanced bionic hands in the world, controlled with her thoughts using AI and non-invasive EEG tech. She can control them even when they're detached.

Which brings us to **the Positives:** For decades, mind–machine interfaces have merely been speculative. Now, they are becoming real tools. BCIs promise to restore lost faculties like speech, mobility, and control to people who medicine previously left behind. One of NeuraLink's recent patients, for example, Brad Smith, an Arizona father of three with ALS no longer has the natural ability to speak to his beloved children, nor to turn his head to gaze upon them. But today, as the company's third patient, he has a natural human voice that doesn't require spelling out each word with subtle eye movements and he can manipulate a camera, all with his thoughts. Thanks to this miracle, Brad Smith can see and speak to his kids again.[10] Longer term, this technology, especially as it becomes noninvasive, will open up radical possibilities for augmenting human cognition or communication, redefining what "normal" human ability might look like for all of us.

Speaking of **medical advances**, researchers at leading institutions have recently unveiled AI systems that dramatically improve early detection of life-threatening conditions. For example, a 2025 study showed an AI model diagnosing sepsis with about 99% accuracy before patients enter a crisis state.[11] Meanwhile, at Vanderbilt University Medical Center, teams have developed machine-learning tools that can flag cancers long before humans can and long before they are out of control, moving from "traditional two-dimensional views to full 3D microenvironment mapping at the subcellular level." And just this week John Hopkins announced it has successfully used AI to detect pancreatic cancer at an early enough stage to successfully treat it, something has previously been impossible.[12]

As if that doesn't say it all, **here's the Positives:** Such advances in medical technologies not only speed up diagnosis, they shift medicine from reactive to proactive. Diseases that once progressed silently and fatally may now be caught early when treatment is far more effective. For patients and practitioners alike, this transforms healthcare from guesswork under pressure to data-driven precision, potentially saving lives that would have once been impossible.

Shifting gears, humanity's rapid migration from rural areas into cities has produced a global housing shortage and an escalating affordability crisis. This year, **3D-printed housing** finally moved beyond the experimental stage and into true neighborhood-scale construction. In Georgetown, Texas, ICON and Lennar are completing Wolf Ranch, a 100-home community that stands as the largest 3D-printed neighborhood to date. And in Houston, the Zuri Gardens project is planning 80 partially 3D-printed homes, priced around the local median and built with a hybrid approach that dramatically speeds construction. Right now, these homes cost a little less or about the same as conventionally built houses; but printing entire neighborhoods at once is expected to reduce costs significantly as scale increases.

Here's the Positives: If this trend continues, 3D-printing could turn affordable, resilient housing into something we can produce quickly, sustainably, and at a scale the world desperately needs. Even more hopeful is the fact that affordability and sustainability are the stated goals of companies like ICON and the Zuri Gardens project. They are for-profit companies that practice the principles of conscious capitalism in service of the greater good.

Next**, Colossal Biosciences** made extraordinary headlines this year by announcing the birth of three dire wolf pups, which they describe as the first of their kind in more than 10,000 years. Their approach uses recovered ancient DNA as a blueprint, then relies on CRISPR and other gene-editing tools to rebuild the extinct genome inside the cells of a living relative. This isn't cloning; it's genome engineering, where scientists recreate the genetic instructions that made a species what it was. Colossal is now applying the same process to the dodo, having successfully edited the germ-line cells of a modern pigeon relative, and to the woolly mammoth, by introducing mammoth genes into Asian elephant cells.

Here's the positives: If these methods continue to mature, they could give us tools for reversing the damage of extinction rather than simply documenting it. De-extinction techniques could help restore lost biodiversity, strengthen endangered species with new genetic resilience, and revive keystone species that once shaped entire ecosystems. In fact, other organizations are currently using genetic science to bring back the American Chestnut tree, once a vital part of our ecosystem. In a century defined by massive ecological loss, the idea that we might be able to bring species back—or even prevent the next round

of extinctions—represents a profound and hopeful shift in how humanity relates to the natural world.

This year, scientists analyzing material returned by OSIRIS-REx from the near-Earth asteroid Bennu uncovered a bonanza of organic compounds and **"building blocks of life"**: amino acids, nucleobases, and, most strikingly, bio-essential sugars such as ribose and glucose, along with a previously unknown "space-gum" polymer that may have helped prebiotic molecules assemble.[13] Meanwhile, on the surface of Mars, the Perseverance rover recently drilled a rock sample from a dry lakebed in Jezero Crater, dubbed Cheyava Falls, and identified chemical and mineral features that scientists now describe as the red planet's most promising potential biosignature yet.[14]

Here's the Positives: This suggests the Universe is far more hospitable to life (or its precursors) than we once believed. If the chemistry for life is common on asteroids, then the seeds of life may have been broadly distributed across the early solar system, offering a plausible mechanism for how life began on Earth. And the Mars findings hint that life, or at least prebiotic chemistry, may once have existed on our neighboring planet. For humanity, this doesn't just expand the frontier of exploration, it challenges the notion that Earth is unique. We might be part of a much larger, living cosmos.

There are so many other technological miracles happening—too many to mention today. Just this week, for instance, news broke that a three-year-old boy with Hunter syndrome, a disease the progressively causes damage to the body and brain, leading to disability and early death, has been successfully treated with groundbreaking gene therapy. Although it has the music and entertainment industry feeling anxious, AI has ushered us into an almost Harry Potteresque world in which, using prompts instead of magical incantations, we can create music, actors, and videos in seconds. One of my favorite stories of 2025 is the XPRIZE award for scalable carbon capture, demonstrating a system capable of removing CO_2 from the atmosphere in a cost-effective, sustainable, verifiable way. Advances in quantum computing and the recent announcement of Project Genesis that will flood AI with generations of scientific data that can lead to unthinkable advances in medicine, science, and physics, are also on my list of highpoints for 2025.

When I first wrote "A Letter to the Far Future" more than twenty years ago, I imagined descendants that might live thousands of years from now. What I didn't realize then is that those descendants might live alongside us, and that we might witness the dawn of their world with our own eyes, even as we become them. Today's technologies are not science fiction. They are happening here, now, in real labs, in real neighborhoods, on real planets and asteroids. The future is arriving early. This may sound scary for some, but as the authors of *Superagency* remind us, *"[We'll] never get the future [we] want simply by prohibiting the future [we] don't want."* Our task is not to resist, but to rise to the occasion by meeting this wondrous moment we're in with intention, imagination, and hope.

1 Ibid, p. 86

2 [Google I/O 2025: Waymo: AI in the physical world powering the future of driving](#)

3 [Self-Driving Car - Business Insider](#)

4 [The eVTOL Revolution Is Here: 3 Flying Car Stocks to Buy in November - 24/7 Wall St.](#)

5 [Flying cars take off in China - People's Daily Online](#)

6 https://www.edge-ai-vision.com/2025/11/humanoid-robots-2025-the-race-to-useful-intelligence/?utm_source=chatgpt.com

7 https://www.forwardfuture.ai/p/the-rise-of-embodied-ai?utm_source=chatgpt.com

8 [Brain-computer interface study wins 2025 Top Ten Clinical Research Achievement Award](#)

9 [Precision Neuroscience - Wikipedia](#)

10 https://www.youtube.com/watch?time_continue=68&v=bukyBm9KTw8&embeds_referring_euri=https%3A%2F%2Fwww.google.com%2F&source_ve_path=Mjg2NjY

11 [AI Detects Sepsis With 99% Accuracy Before Crisis](#)

12 https://www.cs.jhu.edu/news/hold-on-to-your-pants-theres-a-new-pancreatic-cancer-detection-dataset-in-town/

13 https://people.com/nasa-says-building-blocks-of-life-found-on-near-earth-asteroid-bennu-11863620?utm_source=chatgpt.com

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