SUBMITTED STATEMENT OF
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BEFORE THE
JOINT ECONOMIC COMMITTEE
UNITED STATES CONGRESS

HEARING ON
**"ARTIFICIAL INTELLIGENCE AND ITS POTENTIAL TO FUEL ECONOMIC GROWTH AND
IMPROVE GOVERNANCE"**

JUNE 4, 2024

Chairman Heinrich, Vice Chairman Schweikert, and members of the Committee:

Thank you for the invitation to participate in this important hearing on "Artificial Intelligence and Its Potential to Fuel Economic Growth and Improve Governance." My name is Adam Thierer, and I am a senior fellow at the R Street Institute, where I focus on emerging technology issues. I also recently served as a commissioner on the U.S. Chamber of Commerce's Commission on Artificial Intelligence Competitiveness, Inclusion, and Innovation.[1]

Today I will discuss three points relevant to this hearing:

1. First, AI and advanced computational technologies can help fuel broad-based economic growth and sectoral productivity while also improving consumer health and welfare in important ways.
2. Second, to unlock these benefits, the United States needs to pursue a pro-innovation AI policy vision that can also help bolster our global competitive advantage and geopolitical security.
3. Third, we can advance these goals through an AI Opportunity Agenda that includes a learning period moratorium on burdensome new AI regulations.

I will address each point briefly, but I have included three appendices to my testimony offering more details.

AI Could Drive Economic Growth, Increase Sectoral Productivity, and Improve Human Well-Being

AI is set to become the "most important general-purpose technology of our era," and AI could revolutionize every segment of the economy in some fashion.[2] The potential exists for AI to drive explosive economic growth and productivity enhancements.[3] While predictions vary, analysts forecast that AI could deliver trillions in additional global economic activity and

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[1] Commission on Artificial Intelligence Competitiveness, Inclusion, and Innovation, *Commission on Artificial Intelligence Competitiveness, Inclusion, and Innovation: Report and Recommendations*, U.S. Chamber of Commerce, March 2023.
https://www.uschamber.com/assets/documents/CTEC_AICommission2023_Report_v6.pdf.

[2] Erik Brynjolfsson and Andrew McAfee, "The Business of Artificial Intelligence," *Harvard Business Review*, July 18, 2017. https://hbr.org/2017/07/the-business-of-artificial-intelligence.

[3] Tom Davidson, "Could Advanced AI Drive Explosive Economic Growth?," Open Philanthropy, Research Report, June 25, 2021. https://www.openphilanthropy.org/research/could-advanced-ai-drive-explosive-economic-growth; Ege Erdi and Tamay Besiroglu, "Explosive growth from AI automation: A review of the arguments," Arxiv, Oct. 1, 2023. https://arxiv.org/abs/2309.11690.

significantly boost annual GDP growth.[4] This would be over and above the $4 trillion of gross output that the U.S. Bureau of Economic Analysis says the U.S. digital economy already accounted for in 2022.[5] [*See* Appendix I]

But what really matters is what AI means for every American personally. AI is poised to revolutionize health outcomes, in particular. AI is already helping with early detection and treatment of cancers, strokes, heart disease, brain disease, sepsis, and other ailments. AI is also helping address organ failure, paralysis, vision impairments, and much more. The age of personalized medicine will be driven by AI advancement. [*See* Appendix 2]

AI can help make government more efficient, too.[6] Ohio Lt. Gov. Jon Husted recently used an AI tool to help sift through the state's code of regulations and eliminate 2.2 million words' worth of unnecessary and outdated regulations.[7] California Gov. Gavin Newsom just announced an effort to use generative AI tools to improve public services and cut 8 percent from the state's government operations budget.[8] And regulators are using AI to facilitate compliance with existing policies, such as post-market medical device surveillance.[9]

AI also holds the potential to achieve administrative savings for federal health insurance programs or, better yet, reduce the number of people dependent on them by identifying and treating ailments earlier.[10]

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[4] Jacques Bughin, et al., "Notes from the AI Frontier: Modeling the Impact of AI on the World Economy," McKinsey Global Institute, Discussion Paper, Sept. 4, 2018. https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy.

[5] U.S. Bureau of Economic Analysis, "U.S. Digital Economy: New and Revised Estimates, 2017–2022," Dec. 6, 2023. https://apps.bea.gov/scb/issues/2023/12-december/1223-digital-economy.htm.

[6] Richard Williams, "Can AI Help with Forever Regulations?," *Public Health Without Politics*, April 18, 2024. https://fixingfood.substack.com/p/can-ai-help-with-forever-regulations.

[7] Ned Oliver, "Ohio uses AI to eliminate unnecessary words in state administrative code," *Axios*, April 29, 2024. https://www.axios.com/local/columbus/2024/04/29/artificial-intelligence-ai-ohio-state-administrative-code-husted.

[8] Sophia Bollag, "Newsom announces $27.6 billion budget deficit — after state already cut $17 billion," *San Francisco Chronicle*, May 10, 2024. https://www.sfchronicle.com/politics/article/newsom-may-budget-19447474.php.

[9] Jessica Karins, "FDA Draws On AI For First-Ever Proactive Postmarket Surveillance Of Devices," *Inside Health Policy*, May 14, 2024. https://insidehealthpolicy.com/daily-news/fda-draws-ai-first-ever-proactive-postmarket-surveillance-devices.

[10] Mariam Baksh, "Sen. Rounds argues case for spending big on AI-enabled weapons systems, health care," *Inside AI Policy*, May 24, 2024. https://insideaipolicy.com/ai-daily-news/sen-rounds-argues-case-spending-big-ai-enabled-weapons-systems-health-care.

Computational Freedom Is Important for America's Geopolitical Competitiveness and Security

There is an important connection between AI and broader national objectives. A strong technology base is a key source of strength and prosperity, so it is essential that we do not undermine innovation and investment as the next great technological race gets underway with China and the rest of the world.[11]

Luckily, U.S. AI innovators are still in the lead. Had a Chinese operator launched a major generative AI model first, it would have been a "Sputnik moment" for America. Still, China has made its imperial ambitions clear with a goal to become the global leader in advanced computation by 2030, and it has considerable talent, data, and resources to power those ambitions.[12] Experts argue that "China's whole-of-society approach is challenging America's traditional advantages" in advanced technology.[13]

We need a pro-innovation national AI policy that will not only strengthen our economy and provide better products and jobs, but also bolster national security and allow our values of pluralism, personal liberty, individual rights, and free speech to shape global information platforms and markets.[14]

If fear-based policies impede America's AI development and diffusion, then China wins.[15]

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[11] James Pethokoukis, "What's Really at Stake If We Get AI Regulation Wrong," *Faster, Please!* Oct. 30, 2023. https://www.aei.org/articles/whats-really-at-stake-if-we-get-ai-regulation-wrong; American Edge Project, "American Innovation Under Siege: Venture Capital Data Reveal Risks From Rising Global Regulatory Overreach," April 2024. https://americanedgeproject.org/wp-content/uploads/2024/04/AEP-and-PitchBook-Study-March-2024.pdf.

[12] Paul Scharre, *Four Battlegrounds: Power in the Age of Artificial Intelligence* (New York: W. W. Norton & Company (2023); Mariano-Florentino Cuéllar and Matt Sheehan, "AI Is Winning the AI Race," *Foreign Policy*, June 19, 2023. https://foreignpolicy.com/2023/06/19/us-china-ai-race-regulation-artificial-intelligence; Remco Zwetsloot et al., "China is Fast Outpacing U.S. STEM PhD Growth," Center for Security and Emerging Technologies, *CSET Data Brief*, August 2021, https://cset.georgetown.edu/wp-content/uploads/China-is-Fast-Outpacing-U.S.STEM-PhD-Growth.pdf; "Just how good can China get at generative AI?," *The Economist*, May 9, 2023. https://www.economist.com/business/2023/05/09/just-how-good-can-china-get-at-generative-ai; Emerging Technology Observatory, "The state of global AI research," May 2, 2024. https://eto.tech/blog/state-of-global-ai-research.

[13] Graham Allison, et al., "The Great Tech Rivalry: China vs the U.S.," Harvard Kennedy School Belfer Center for Science and International Affairs, *Paper*, December 2021. https://www.belfercenter.org/sites/default/files/GreatTechRivalry_ChinavsUS_211207.pdf.

[14] Loren B. Thompson, "Why U.S. National Security Requires A Robust, Innovative Technology Sector," Lexington Institute, Oct. 8, 2020. https://www.lexingtoninstitute.org/why-u-s-national-security-requires-a-robust-innovative-technology-sector.

[15] Keegan McBride, "The Threat of "AI Safety" to American AI Leadership," *National Interest*, April 28, 2024. https://nationalinterest.org/blog/techland/threat-"Cai-safety"-american-ai-leadership-210780.

Protect the Freedom to Innovate with an "AI Opportunity Agenda"

To achieve the benefits AI offers and meet the rising global competition, America needs an AI Opportunity Agenda.

An AI Opportunity Agenda begins by reiterating that the freedom to innovate is the cornerstone of American technology policy and the key to unlocking the enormous potential of our nation's entrepreneurs and workers.[16]

As part of this Agenda, Congress should craft a learning period moratorium on new proposals, such as new AI-specific bureaucracies, licensing systems, or liability schemes, all of which would be counterproductive and undermine our nation's computational capabilities. [*See* Enclosure I]

In addition, this moratorium should preempt burdensome state and local regulatory enactments that conflict with our national AI policy framework.[17]

Next, Congress should require our government's existing 439 federal departments to evaluate their current policies toward AI systems with two purposes in mind. First, to ensure that they are not over-burdening algorithmic systems with outdated policies, and second, to determine how existing rules and regulations are capable of addressing the concerns that some have raised about AI. Taking inventory of existing rules and regulations can then allow policymakers to identify any gaps that Congress ought to address using targeted remedies.

Finally, an AI Opportunity Agenda requires an openness to new talent and competition.[18] With experts finding that a "talent war is brewing between the US and China," and that China is moving ahead in some important ways, we must take steps to attract and retain the world's best and brightest data scientists and computer engineers.[19]

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[16] Adam Thierer, "Flexible, Pro-Innovation Governance Strategies for Artificial Intelligence," *R Street Policy Study* No. 283 (April 20, 2023). https://www.rstreet.org/research/flexible-pro-innovation-governance-strategies-for-artificial-intelligence.

[17] Adam Thierer, "State and local meddling threatens to undermine the AI revolution," *The Hill*, Jan. 21, 2024. https://thehill.com/opinion/4420144-state-and-local-meddling-threatens-to-undermine-the-ai-revolution.

[18] Tina Huang and Zachary Arnold, "Immigration Policy and the Global Competition for AI Talent," Center for Security and Emerging Technology, June 2020. https://cset.georgetown.edu/publication/immigration-policy-and-the-global-competition-for-ai-talent; Connor O'Brien and Adam Ozimek, "Foreign-born skilled workers play a critical role in strategically significant industries," Economic Innovation Group, *Analysis*, April 2, 2024. https://eig.org/hsi-in-strategic-industries; Pierre Azoulay, et al., "Immigration and Entrepreneurship in the United States," American Economic Review, 2020. https://www.nber.org/papers/w27778.

[19] Isobel Asher Hamilton, "The Next Big US-China Trade War is Over AI Talent," *The Daily Upside*, May 17, 2024. https://www.thedailyupside.com/technology/artificial-intelligence/the-next-big-us-china-trade-war-is-over-ai-talent; Stuart Anderson, "AI Commission: Immigrants Key To America's Tech Competitiveness," *Forbes*, March 3,

Conclusion

In sum, America's AI policy should be rooted in patience and humility instead of a rush to over-regulate based on hypotheticals and worst-case thinking.[20] We are still very early in the AI lifecycle, and there is still no consensus on how to define the term, let alone legislate beyond establishing definitions.[21]

To ensure America leads this next great technological revolution, Congress must once again uphold the freedom to innovate and craft a flexible, risk-based AI policy vision to ensure we can meet global competition, advance economic opportunity, and improve the well-being of every citizen.

Thank you for holding this hearing and for your consideration of my views. I look forward to any questions you may have.

See pages 6-12 for Appendix 1, "How AI Could Drive Economic Growth and Sectoral Productivity."

See pages 13-21 for Appendix 2, "AI's Potential for Improving Medicine and Health Outcomes."

See pages 22-25 for Enclosure 1, "Getting AI Policy Right Through a Learning Period Moratorium," R Street Institute, May 29, 2024. https://www.rstreet.org/commentary/getting-ai-policy-right-through-a-learning-period-moratorium.

2021. https://www.forbes.com/sites/stuartanderson/2021/03/03/ai-commission-immigrants-key-to-americas-tech-competitiveness.

[20] Adam Thierer, "A balanced AI governance vision for America," *The Hill*, April 16, 2023. https://thehill.com/opinion/congress-blog/3953916-a-balanced-ai-governance-vision-for-america.

[21] U.S. Government Accountability Office, "Artificial Intelligence: Emerging Opportunities, Challenges, and Implications," *Technology Assessment*, GAO-18-142SP, (March 28, 2018), p. 15. https://www.gao.gov/products/gao-18-142sp.

Appendix 1: How AI Could Drive Economic Growth and Sectoral Productivity

Over the past half century, there have been waves of both great excitement and disillusionment about the prospects for AI advancement.[22] AI historians often speak of the many AI "springs" and "winters"—what one might think of as AI booms and busts—that have come and gone.[23]

It did not help that some of AI's early pioneers over-exuberantly predicted that powerful "superintelligence" would be with us in short order. In the late 1960s, for example, noted AI researchers confidentially predicted that "machines will be capable, within twenty years, of doing any work a man can do," (Herbert A. Simon), and that "[i]n from three to eight years we will have a machine with the general intelligence of an average human being" (Marvin Minsky).[24] Such exuberance was replaced by pessimism in the 1970s, resulting in a "winter" period for AI research and investment.

Today, however, AI is generally thought to be in the midst of another spring as enthusiasm grows around specific capabilities and applications. Economists predict that AI is set to become the "most important *general-purpose technology* of our era."[25] General-purpose technologies will become intertwined with almost every other economic sector and used ubiquitously throughout society.[26] These developments are coming about because we live in an era of rapid-fire *combinatorial innovation* in which new technologies are building on top of one another in a symbiotic fashion, further accelerating their development and sophistication.[27]

Improving Many Sectors, Including Government

The power of algorithmic technologies is all around us in products and services such as speech and image recognition tools on our smartphones and the recommender systems many media providers and other companies use to tailor goods, services, and content to our interests. AI will be used by almost all organizations to help improve analytics and marketing, enhance customer

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[22] Robert D. Atkinson, "'It's Going to Kill Us!' and Other Myths about the Future of Artificial Intelligence," Information Technology and Innovation Foundation, June 2016. http://www2.itif.org/2016-myths-machine-learning.pdf.

[23] Melanie Mitchell, "Why AI is Harder Than We Think," April 28, 2021. https://arxiv.org/pdf/2104.12871.pdf.

[24] Gil Press, "A Very Short History Of Artificial Intelligence (AI)," *Forbes*, Dec. 30. 2016. https://www.forbes.com/sites/gilpress/2016/12/30/a-very-short-history-of-artificial-intelligence-ai.

[25] Erik Brynjolfsson and Andrew McAfee, "The Business of Artificial Intelligence," *Harvard Business Review*, July 18, 2017. https://hbr.org/2017/07/the-business-of-artificial-intelligence.

[26] Timothy F. Bresnahan and M. Trajtenberg, "General Purpose Technologies 'Engines of Growth'?," *Journal of Econometrics* 65:1 (1995), pp. 83-108.

[27] Hal R. Varian, "Computer Mediated Transactions," *American Economic Review* 100:2 (May 2010). https://www.aeaweb.org/articles?id=10.1257/aer.100.2.1.

service, and boost sales or performance in various new ways. And it will completely upend the way production and work is done in countless fields and professions.

AI and ML capabilities are operating behind the scenes to help with fraud and spam detection, computer virus filtering, content management/moderation,[28] mapping/navigation,[29] travel planning,[30] weather forecasting and natural disaster prediction,[31] warehouse automation/inventory management,[32] supply chain management,[33] and various other logistics.[34] For example, in 2021, McKinsey & Company estimated that "[s]uccessfully implementing AI-enabled supply-chain management has enabled early adopters to improve logistics costs by 15 percent, inventory levels by 35 percent, and service levels by 65 percent, compared with slower-moving competitors."[35] These productivity enhancements will likely accelerate as algorithmic techniques are further refined.

AI and ML capabilities also power most of the devices that make up the so-called *Internet of Things* and various connected "smart" devices, including many wearable technologies and other devices with embedded sensors.[36] Another related term here is *ambient computing*[37] or *ubiquitous computing*, which essentially means "using computers without knowing that you are

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[28] Alex Feerst, "The Use of AI in Online Content Moderation," American Enterprise Institute (September 2022). https://platforms.aei.org/the-use-of-ai-in-online-content-moderation.

[29] Arianna Johnson, "You're Already Using AI: Here's Where It's At In Everyday Life, From Facial Recognition To Navigation Apps," *Forbes*, April 14, 2023. https://www.forbes.com/sites/ariannajohnson/2023/04/14/youre-already-using-ai-heres-where-its-at-in-everyday-life-from-facial-recognition-to-navigation-apps/?sh=1996a1f927ac.

[30] Jacob Passy, "Expedia Wants ChatGPT to Be Your Travel Adviser," *The Wall Street Journal*, April 4, 2023. https://www.wsj.com/articles/expedia-chatgpt-ai-travel-app-22ffd00.

[31] Robin Fearon, "AI Tools Help to Predict Extreme Weather and Save Lives," *Discovery*, Aug. 2, 2022. https://www.discovery.com/science/ai-tools-help-to-predict-extreme-weather; "Deep learning can predict tsunami impacts in less than a second," *Phys.org*, Dec. 27, 2022. https://phys.org/news/2022-12-deep-tsunami-impacts.html; "NASA-enabled AI Predictions May Give Time to Prepare for Solar Storms," NASA, March 30, 2023. https://www.nasa.gov/feature/goddard/2023/sun/nasa-enabled-ai-predictions-may-give-time-to-prepare-for-solar-storms.

[32] "How AI-Powered Robots Fulfill Your Online Orders," *Last Week in AI*, Jan. 25, 2022. https://lastweekin.ai/p/robot-picking.

[33] Christopher Mims, "How to Build AI That Actually Works for Your Business," *The Wall Street Journal*, July 23, 2022. https://www.wsj.com/articles/how-to-build-ai-that-actually-works-for-your-business-11658548830.

[34] Cem Dilmegan, "Top 15 Use Cases and Applications of AI in Logistics in 2022," July 9, 2020, updates, May 29, 2022. https://research.aimultiple.com/logistics-ai.

[35] "Succeeding in the AI Supply-chain Revolution," *Article*, April 30, 2021. https://www.mckinsey.com/industries/metals-and-mining/our-insights/succeeding-in-the-ai-supply-chain-revolution.

[36] Adam Thierer, "The Internet of Things and Wearable Technology: Addressing Privacy and Security Concerns without Derailing Innovation," *Richmond Journal of Law and Technology* 21:6 (2015). http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2494382.

[37] Christopher Mims, "Why the Future of the Computer Is Everywhere, All the Time," *The Wall Street Journal*, Oct. 29, 2022. https://www.wsj.com/articles/computer-technology-ambient-computing-11666992784.

using one," or using smart systems without explicitly calling them computers.[38] These technologies have powerful health and medical applications, among other things.

Meanwhile, various AI-powered robotic technologies are already at work in many industrial sectors.[39] AI, ML, and advanced robotics technologies promise to revolutionize many fields including advertising and marketing,[40] agriculture,[41] archeology,[42] auto safety,[43] aviation,[44] education,[45] endangered species protection,[46] energy and climate solutions,[47] entertainment,[48]

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[38] Ethem Alpaydin, Machine Learning (The MIT Press, 2021), p. 9.

[39] *A Roadmap for US Robotics From Internet to Robotics: 2020 Edition*, Sept. 9, 2020. https://www.hichristensen.com/pdf/roadmap-2020.pdf.

[40] Suzanne Vranica, "How AI Has the Advertising Business Excited—and Worried," *The Wall Street Journal*, June 19, 2023. https://www.wsj.com/articles/ai-advertising-industry-tools-risks-f880420a.

[41] Louis Columbus, "10 Ways AI Has the Potential To Improve Agriculture In 2021," *Forbes*, Feb. 17, 2021. https://www.forbes.com/sites/louiscolumbus/2021/02/17/10-ways-ai-has-the-potential-to-improve-agriculture-in-2021/?sh=454d747a7f3b; Loukia Papadopoulos, "New Farming Robot Uses AI to Kill 100,000 Weeds per Hour," *Interesting Engineering*, April 27, 2021. https://interestingengineering.com/innovation/new-farming-robot-uses-ai-to-kill-100000-weeds-per-hour; Blake Hurst, "As Rural America Declines, There Are Still Plenty of Farmers," *The Wall Street Journal*, March 10, 2024. https://www.wsj.com/articles/as-rural-america-declines-there-are-still-plenty-of-farmers-agricultural-census-3794ce04.

[42] Diego Lopez Marina, "How AI helped archaeologists in Peru discover 4 new Nazca Line geoglyphs," *Peru Reports*, June 14, 2023. https://perureports.com/how-ai-helped-archaeologists-in-peru-discover-4-new-nazca-line-geoglyphs/10165.

[43] Mobility, "Artificial Intelligence Reshaping the Automotive Industry," *Future Bridge*, April 29, 2020. https://www.futurebridge.com/industry/perspectives-mobility/artificial-intelligence-reshaping-the-automotive-industry.

[44] Kelsey Reichmann, "How Is the Aviation Industry Enabling Innovation with Artificial Intelligence?," *Aviation Today*, Dec. 14, 2020. https://www.aviationtoday.com/2020/12/14/aviation-industry-enabling-innovation-artificial-intelligence.

[45] Sara Randazzo, "Can Tech Boost Reading? Literacy Tools Come to Classrooms," *The Wall Street Journal*, Aug. 7, 2022. https://www.wsj.com/articles/literacy-technology-offers-new-ways-to-teach-kids-to-read-11659879846; Frederick M. Hess, "AI and the Future of Schooling," *The Ripon Forum* 57:3 (June 2023). https://riponsociety.org/article/ai-and-the-future-of-schooling.

[46] Justine Calma, "How Machine Learning Could Help Save Threatened Species from Extinction," *The Verge*, Aug. 4, 2022. https://www.theverge.com/23290902/machine-learning-conservation-data-deficient-species-iucn-red-list-extinction-threat.

[47] Franklin Wolfe, "How Artificial Intelligence Will Revolutionize the Energy Industry," Harvard University Graduate School of Arts and Sciences, *Special Edition on Artificial Intelligence*, Aug. 28, 2017. https://sitn.hms.harvard.edu/flash/2017/artificial-intelligence-will-revolutionize-energy-industry; Scott Patterson, "Why AI Is the Next Big Bet for Climate Tech," *The Wall Street Journal*, June 1, 2023. https://www.wsj.com/articles/ai-climate-change-clean-energy-investment-e4242a23; Vidya Nagalwade, "Machine Learning can be used to improve energy use in cities," *TechExplorist*, May 7, 2023. https://www.techexplorist.com/machine-learning-used-improve-energy-use-cities/60013.

[48] Anne Hobson, "Artificial Intelligence is Set to Remake Event Experiences," *The Hill*, Jan. 11, 2017. https://www.rstreet.org/2017/01/11/artificial-intelligence-is-set-to-remake-event-experiences.

financial services,[49] legal services,[50] retail,[51] transportation,[52] and others.[53] Going forward, every segment of the economy will be touched by AI and robotics in some fashion; therefore, it should be equally clear that public policy will be transformed in the process.

AI will affect government processes, too.[54] In April 2024, Ohio Lt. Gov. Jon Husted used an AI tool to help sift through the state's code of regulations and eliminate 2.2 million words' worth of unnecessary and outdated regulations.[55] In May 2024, California Gov. Gavin Newsom announced an effort to use generative AI tools to improve public services and cut 8 percent from the state's government operations budget.[56] AI is also being used by regulators to facilitate compliance with existing policies. For example, the U.S. Food and Drug Administration (FDA) has been using AI for post-market medical device surveillance.[57]

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[49] Suparna Biswas, et al., "AI-Bank of the Future: Can Banks Meet the AI Challenge?," McKinsey & Company, Sept. 19, 2020. https://www.mckinsey.com/industries/financial-services/our-insights/ai-bank-of-the-future-can-banks-meet-the-ai-challenge.

[50] Pierre Colombo, et al., "SaulLM-7B: A pioneering Large Language Model for Law," *arXiv*, March 7, 2024. https://arxiv.org/abs/2403.03883v1.

[51] Ben Forgan, "What Robots Can Do for Retail," *Harvard Business Review*, Oct. 1, 2020. https://hbr.org/2020/10/what-robots-can-do-for-retail.

[52] Maria Lopez Conde and Ian Twinn, "How Artificial Intelligence is Making Transport Safer, Cleaner, More Reliable and Efficient in Emerging Markets," International Finance Corporation, *Note* 75 (November 2019). https://www.ifc.org/wps/wcm/connect/7c21eaf5-7d18-43b7-bce1-864e3e42de2b/EMCompass-Note-75-AI-making-transport-safer-in-Emerging-Markets.pdf.

[53] Dan Castro and Joshua New, *The Promise of Artificial Intelligence* (Center for Data Innovation, October 2016). https://datainnovation.org/2016/10/the-promise-of-artificial-intelligence.

[54] Richard Williams, "Can AI Help with Forever Regulations?," *Public Health Without Politics*, April 18, 2024. https://fixingfood.substack.com/p/can-ai-help-with-forever-regulations.

[55] Ned Oliver, "Ohio uses AI to eliminate unnecessary words in state administrative code," *Axios*, April 29, 2024. https://www.axios.com/local/columbus/2024/04/29/artificial-intelligence-ai-ohio-state-administrative-code-husted.

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AI, Economic Growth, and Productivity Gains

The potential exists for AI to drive explosive economic growth and productivity enhancements.[58] While predictions vary, most analysts believe that "AI will have a significant economic impact."[59]

- According to Grand View Research, a market research and consulting company based in India and the United States, the global AI market was valued at $93.5 billion in 2021 and is projected to expand at a compound annual growth rate of 38.1 percent from 2022 to 2030.[60]
- A 2018 McKinsey study estimated that "AI has the potential to deliver additional global economic activity of around $13 trillion by 2030, or about 16 percent higher cumulative GDP compared with today. This amounts to 1.2 percent additional GDP growth per year."[61] In the summer of 2023, McKinsey released another study estimating that generative AI alone could add up to $4.4 trillion of value to the global economy annually.[62]
- An earlier PwC report forecast a $15.7 trillion potential contribution to the global economy by 2030.[63]
- A 2023 Goldman Sachs report predicted AI could help boost U.S. labor productivity by 1.5 percentage points each year, while Peterson Institute for International Economics estimates AI will add an additional 1.0 percentage points to productivity growth over the

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[58] Tom Davidson, "Could Advanced AI Drive Explosive Economic Growth?," Open Philanthropy, *Research Report*, June 25, 2021. https://www.openphilanthropy.org/research/could-advanced-ai-drive-explosive-economic-growth; Ege Erdi and Tamay Besiroglu, "Explosive growth from AI automation: A review of the arguments," Arxiv, Oct. 1, 2023. https://arxiv.org/abs/2309.11690; Aden Barton, "The case for—and against—rapid AI-driven growth," *Understanding AI*, Jan. 30, 2024. https://www.understandingai.org/p/the-case-forand-againstrapid-ai-driven.

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[60] Grand View Research, "Artificial Intelligence Market Size Report, 2022-2030," GVR-1-68038-955-5, April 2022. https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-ai-market.

[61] Jacques Bughin, et al., "Notes from the AI Frontier: Modeling the Impact of AI on the World Economy," McKinsey Global Institute, *Discussion Paper*, Sept. 4, 2018. https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy.

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2025-2028 timeframe.[64] Goldman also says generative AI could drive a 7 percent (or almost $7 trillion) increase in global GDP over a 10-year period.[65]

- Another leading economist with a specialization in technology argues that AI will double productivity in the coming decade.[66]

Even if AI's economic impact falls far short of those estimates, it would still generate enormous growth opportunities across many segments of the economy. AI is also invigorating new types of tech competition, especially from open-source players and platforms.[67] It also promises to benefit small businesses by creating new products and jobs. A U.S. Chamber of Commerce report finds that 87 percent of small businesses reported increased efficiency due to new technology platforms and that one in four small businesses are already using AI.[68]

The Past Can Be Prologue

If this potential for explosive growth still sounds outlandish, consider that, in 1998, Nobel Prize-winning economist Paul Krugman infamously predicted that the internet's impact on the global economy would be "no greater than the fax machine's."[69] President Bill Clinton thought differently, predicting that the internet's potential was "nothing short of revolutionary" and that "[i]n just a few years, it will generate hundreds of billions of dollars in goods and services."[70]

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[64] Joseph Briggs and Devesh Kodnani, "The Potentially Large Effects of Artificial Intelligence on Economic Growth," Goldman Sachs, *Global Economics Analyst*, March 26, 2023. https://www.gspublishing.com/content/research/en/reports/2023/03/27/d64e052b-0f6e-45d7-967b-d7be35fabd16.htmlhttps://www.gspublishing.com/content/research/en/reports/2023/03/27/d64e052b-0f6e-45d7-967b-d7be35fabd16.html; Adam Posen, "The Keynote Economic Forecast by Dr. Adam Posen, Peterson Institute - Endowments & Foundations Roundtable West 2024," *Institutional Investor*, Feb. 8, 2024. https://iinetworks.com/content/keynote-economic-forecast-dr-adam-posen-peterson-institute-endowments-foundations.

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[67] Betsy Masiello and Derek Slater, "Will Open Source AI Shift Power from 'Big Tech'? It Depends," *Tech Policy Press*, June 16, 2023. https://techpolicy.press/will-open-source-ai-shift-power-from-big-tech-it-depends; Belle Lin, "Open-Source Companies Are Sharing Their AI Free. Can They Crack OpenAI's Dominance?," *The Wall Street Journal*, March 21, 2024. https://www.wsj.com/articles/open-source-companies-are-sharing-their-ai-free-can-they-crack-openais-dominance-26149e9c.

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[69] David Emery, "Did Paul Krugman Say the Internet's Effect on the World Economy Would Be 'No Greater Than the Fax Machine's'?," *Snopes*, June 7, 2018. https://www.snopes.com/fact-check/paul-krugman-internets-effect-economy.

[70] The White House, "Remarks by the President in Announcement of Electronic Commerce Initiative," July 1, 1997. https://clintonwhitehouse4.archives.gov/WH/New/Commerce/remarks.html.

Clinton's optimism was vindicated. Electronic commerce exploded, and digital innovation became the foundation of significant economic growth, new jobs, and boundless speech opportunities. According to the U.S. Bureau of Economic Analysis, in 2022, the U.S. digital economy accounted for over $4 trillion of gross output, $2.6 trillion of value added (translating to 10 percent of U.S. GDP), $1.3 trillion of compensation, and 8.9 million jobs.[71]

These astonishing results came about thanks to wise bipartisan public policies formulated by the Clinton administration and a Republican-led Congress.[72] Freedom to innovate was America's policy default for digital services, and burdensome state regulations (and even taxes) were preempted to a degree.[73] Federal policymakers made a firm break with the old regulatory models of the analog era, which had constrained competition. The results speak for themselves. In addition to generating remarkable economic output and opportunity, this approach resulted in global dominance of digital technology markets. Today, 18 of the 25 largest digital companies in the world are U.S.-based, and it is difficult to name any from Europe.[74] In essence, as a recent

Wall Street Journal headline observed, the European Union now "regulates its way to last place" on digital technology.[75]

This should serve as a cautionary tale for U.S. policymakers. America got policy right for the internet, but the sort of approach adopted for AI remains to be seen. If we want U.S. firms to once again lead the world—and help counter China's looming influence on AI markets in particular—it is essential for policymakers to strike the right policy balance once again.[76]

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[73] Adam Thierer, "Getting AI Innovation Culture Right," *R Street Policy Study* No. 281 (March 30, 2023). https://www.rstreet.org/research/getting-ai-innovation-culture-right.

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Appendix 2: AI's Potential for Improving Medicine and Health Outcomes

AI is already revolutionizing the field of healthcare and the practice of medicine.[77] Increasingly powerful algorithmic systems—often combined with new wearable technologies—are already helping many people better monitor their health and fitness.[78] Generative AI tools will also supplement remote medicine with virtual health care assistants.[79] More sophisticated AI tools are allowing doctors and scientists to create highly personalized care options and develop new medical treatments tailored to the unique needs of each patient.[80] As two medical experts and authors of *The Age of Scientific Wellness* have noted, "those who fold these systems into their practices will be doing their patients (and themselves) a great service" because "they are akin to having not one expert but thousands upon thousands, all working together at top speed. Because AI is generally inexpensive to run once it has been developed, the potential for optimizing care and making it radically cheaper is striking."[81]

AI and ML-enabled technologies are already having a profound impact on public health. Machine learning refers to the processes by which a computer can train and improve an algorithm or computer model without step-by-step human involvement.[82]

In 2022, for example, an AI technology from Google DeepMind called AlphaFold was able to model the structure of nearly all known proteins, representing "a significant advance in biology that will accelerate drug discovery and help address problems such as sustainability and food insecurity."[83] Researchers from the Fundamental AI Research Team at Meta have a competing

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[77] J. Hunter Young, et al., "How Algorithms Could Improve Primary Care," *Harvard Business Review*, May 6, 2022. https://hbr.org/2022/05/how-algorithms-could-improve-primary-care; PwC, *What Doctor? Why AI and Robotics Will Define New Health* (2017). https://www.pwc.com/gx/en/industries/healthcare/publications/ai-robotics-new-health/transforming-healthcare.html; Jordan Reimschisel, "The Robot That Saved My Life," *Medium*, April 27, 2017. https://aboveintelligent.com/that-robot-saved-my-life-6499d9a2f384.

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[80] Anna Megdell, "Machine Learning Creates Opportunity for New Personalized Therapies," University of Michigan Health Lab, *Lab Notes*, Sept. 27, 2022. https://labblog.uofmhealth.org/lab-notes/machine-learning-creates-opportunity-for-new-personalized-therapies.

[81] Lee Hood and Nathan Price, "The AI Will See You Now," *The Wall Street Journal*, April 7, 2023. https://www.wsj.com/articles/the-ai-will-see-you-now-5f8fba14.

[82] Ethem Alpaydin, *Machine Learning* (The MIT Press, 2021), p. 16.

[83] Steven Rosenbush, "DeepMind AI Lab Predicts Structure of Most Proteins," *The Wall Street Journal*, July 28, 2022. https://www.wsj.com/articles/deepmind-ai-lab-predicts-structure-of-most-proteins-11659048143.

ML-created database of 617 million predicted protein structures.[84] These advances are leading to what some researchers call a "protein design revolution" driving "the next quantum leap in the biotech industry," which could completely transform medicine.[85] This competition continues, as DeepMind announced the latest and more powerful iteration of AlphaFold in April 2024.[86]

A Broad Range of Health Benefits

AI, ML, and robotics are driving many other major medical advances today, becoming a crucial part of early detection of various ailments and diseases.[87] "Artificial-intelligence algorithms are processing vast troves of data in electronic medical records, searching for patterns to predict future outcomes and recommend treatments," notes a *Wall Street Journal* medical reporter.[88] "They are creating early-warning systems to help hospital staff spot subtle but serious changes in a patient's condition that aren't always visible or noticed in a busy unit, and predicting which patients about to be discharged from the hospital are at highest risk of being readmitted."[89]

Here are some other specific examples of how AI, ML, and robotics technologies are already advancing medical science and helping improve health outcomes.

- *Organ donation*: In the field of organ donations, "[p]aired kidney donation is one of the great success stories of artificial intelligence," helping doctors and patients by taking "an incredibly complex problem and solves it faster and with fewer errors than humans can, and saving more lives as a result."[90]
- *Heart attack detection and treatment*: AI and ML tools are helping detect and treat heart disease and heart attacks, a leading cause of death globally.[91] Scientists at Cedars-Sinai

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[84] Justin Jackson, "Predicting protein folding from single sequences with Meta AI ESM-2," *Phys.org*, March 23, 2023. https://phys.org/news/2023-03-protein-sequences-meta-ai-esm-.html.

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[90] Corinne Purtill, "How AI Changed Organ Donation in the US," *Quartz*, Sept. 10, 2018. https://qz.com/1383083/how-ai-changed-organ-donation-in-the-us.

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developed an algorithmic tool in 2022 that can quantify coronary plaque buildup in five to six seconds compared to at least 25 to 30 minutes before.[92] This will greatly improve the ability to predict who will have a heart attack. Other researchers have developed AI tools to help improve personalized treatment for women who have had heart attacks.[93] Women who suffer a heart attack have a higher mortality rate than men, often because their symptoms are not properly understood or diagnosed. Meanwhile, the British National Health Service recently started using a new AI tool that can detect heart disease in just 20 seconds while patients are in an MRI scanner, compared with the 13 minutes or more it usually takes doctors to analyze images manually after performing a scan.[94]

- *Cancers*: President Richard Nixon declared a national "war on cancer" over 50 years ago.[95] More recently, the Obama and Biden administrations pushed for a "cancer moonshot."[96] Unfortunately, cancers remain the second leading causes of death in the United States,[97] claiming 602,350 lives in 2020 alone.[98] AI and ML-enabled technologies are poised to help reduce that staggering death toll. Mayo Clinic researchers have shown how ML models can help diagnose and treat pancreatic cancer at an earlier stage.[99] Pancreatic cancer is the third leading cause of cancer deaths, claiming 46,774 lives in 2020.[100] British scientists have recently reported on new AI software that can spot signs of pre-cancer during endoscopies in 92 percent of patients, which could significantly lower deaths from esophageal cancer.[101] AI/ML techniques are also helping with early

fast, accurate way of diagnosing heart attack," *New Atlas*, May 15, 2023. https://newatlas.com/health-wellbeing/code-acs-machine-learning-algorithm-accurate-heart-attack-diagnosis.

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detection and treatment of lung cancer,[102] breast cancer,[103] brain cancer,[104] cervical cancer,[105] and many other types of cancer[106] (including undiagnosable cancers[107]), aided by increasingly personalized screening techniques.[108] The FDA has started approving more AI-powered medical devices that can help facilitate early detection of the most prevalent cancers.[109] AI-enabled cancer detection tools can help alleviate some of the workload that human radiologists and other cancer doctors face.[110]

- *Sepsis and superbugs:* Recent medical studies have also documented how AI-powered monitoring systems are helping detect antibiotic-resistant "superbugs"[111] and sepsis,[112]

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saving thousands of lives each year as a result. Roughly 1.7 million adults develop sepsis each year in the United States, and more than 250,000 of them die.[113] Researchers find that the use of AI "dramatically cuts the time it takes to sort through thousands of promising compounds" to fight drug-resistant pathogens.[114]

- *Paralysis*: The Christopher & Dana Reeve Foundation has estimated that nearly 1 in 50 people in the United States are living with paralysis.[115] The combination of AI and robotic technologies holds promise for helping paralyzed individuals regain certain motor functions.[116] In May 2023, a Dutch man paralyzed from the waist down for more than a decade regained his ability to walk thanks to brain and spine implants and an AI-enabled thought decoder that helped him translate electrical brain signals into muscle movement.[117] He is now able to walk around his own home and get in and out of a car on his own. A paralyzed American man regained his sense of touch and mobility thanks to similar AI-enabled brain implants.[118] AI and ML capabilities are powering other brain-machine implants that are helping address disabilities in other ways, including regaining the ability to speak after a stroke.[119] And *The New York Times* recently documented how a woman who lost her arm in an accident is now able to control her new prosthetic robotic arm thanks to advances in AI and sensors embedded in her body.[120]

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- *Mental health and drug addiction*: AI can help identify and address mental health problems through textual analysis, which can supplement human-based analysis at a time when there is a nationwide shortage of health care workers in this area.[121] AI tools are also being tapped to help find novel drugs that can help counter opioid addiction, which has become a chronic problem in recent years.[122]

There are many other current or potential health-related applications for algorithmic technologies, including abnormal chest X-ray detection,[123] AI-powered ultrasounds,[124] new drug and vaccine discovery,[125]and detecting and addressing eye disease and blindness.[126] In April 2024, the National Institutes of Health announced a new breakthrough in AI retinal imaging that produces high-resolution images of cells in the eye 100 times faster and with a 3.5-fold improvement in image contrast.[127] AI and ML will power other advanced learning capabilities that will help doctors and scientific researchers access and understand massive amounts of patient and health data and put it to even better use. These same capabilities will help innovators create new personalized health monitoring and tracking systems for the public.[128]

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AI Will Help Doctors, Nurses, and Scientists Advance Treatments

In 2022, I served as a member of the U.S. Chamber of Commerce's "AI Commission on Competition, Inclusion, and Innovation," a group formed to study AI governance. At a spring 2022 field hearing, our Commission heard remarks from Cleveland Clinic CEO and President Tom Mihaljevic, MD and several of his colleagues.[129] These doctors and scientists highlighted how they were already using AI/ML to improve patient care and save lives. They noted how teams of doctors and researchers are now able to share information from tissue samples with much larger teams of medical experts, who can—with the help of algorithmic systems—work together at a distance to better understand and use all the information at their fingertips. Additionally, along with other medical centers, the Clinic has developed better AI-driven methods to detect irregular heartbeats and strokes and to diagnose degenerative brain diseases like Alzheimer's, dementia, and Parkinson's.[130]

This only scratches the surface of what AI/ML will mean for patient care.[131] Dr. Mihaljevic noted that, when he started practicing medicine in the 1980s, the overall volume of medical information doubled roughly every seven years; today, it doubles every 73 days.[132] Meanwhile, 7,000 medical papers are published *every day*.[133] A recent study in *Science* shows that, in the closely related field of medical robotics, the number of scientific papers has grown exponentially from less than 10 published in 1990 to more than 5,200 in 2020.[134] These numbers align with broader trends in technical and scientific literature. "Since the scientific literature doubles roughly every 12 years, this means that of all scientific work ever produced, half of it has been produced in the last 12 years," note the authors of *The Science of Science*.[135]

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The only way to take full advantage of this explosion of knowledge is with the power of machine-reading and -learning technologies. As the National Cancer Institute summarizes, "what scientists are most excited about is the potential for AI to go beyond what humans can currently do themselves. AI can 'see' things that we humans can't, and can find complex patterns and relationships between very different kinds of data."[136] The authors of *The Age of Scientific Wellness* speak of the rise of 'centaur doctors' who, combining the best parts of human intelligence and AI assistance, will be empowered to make bold medical decisions with far fewer unintended consequences."[137] Further, AI assistants can help address the significant paperwork and filing burdens today's doctors and nurses face, freeing up time for patient care and research.[138]

In the process, AI/ML will also help share medical knowledge across far more institutions and reach more patients as a result. Dr. Mihaljevic estimated that the Cleveland Clinic—one of the most important medical research facilities in the nation—is only able to reach an estimated 1.5 percent of Americans using traditional means of care. ML and AI can change that equation by greatly expanding opportunities for Americans to access the benefits of scientific knowledge and medical care from the Cleveland Clinic and America's many other world-class medical facilities, labs, and universities. Dr. Mihaljevic specifically highlighted AI's key role in improving home-based medical care, which will become an essential way to help a rapidly aging population in the future, regardless of where they live.[139] AI will also become crucial for various surgeries, improving outcomes when operations are necessary (often through robotic-assisted surgery)[140] or, better yet, avoiding the need for invasive procedures altogether.[141] Robotic surgery at a distance is also becoming possible thanks to recent advances.[142]

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Conclusion

Policymakers should not underestimate the importance of AI/ML technology and must work diligently to ensure America remains a leader in this field. While some experts predict another AI winter could be coming following some notable narrow AI disappointments, they oftentimes fail to identify how public policy influences that outcome.[143] The overall amount of innovation we can expect to flow from this space is fundamentally tied up in the question of whether or not America creates the right innovation culture for AI.[144] To achieve its full potential and bring about the "AI revolution in medicine" that some predict, America will need to set its policy defaults in such a way that encourages innovation while addressing the many legitimate concerns about various AI capabilities.[145]

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Enclosure 1: Getting AI Policy Right through a Learning Period Moratorium

By Adam Thierer
May 29, 2024

While some artificial intelligence (AI) critics want to pause AI development, the pause most needed today is on overzealous regulatory proposals that could kneecap America's lead in computational science and algorithmic technologies. With over 700 federal and state AI legislative proposals threatening to drown AI innovators in a tsunami of red tape, Congress should consider adopting a "learning period" moratorium that would limit burdensome new federal AI mandates as well as the looming patchwork of inconsistent state and local laws.

The time to do so is now, with the race for AI supremacy against China intensifying and other nations investing heavily to counter the United States. Handcuffing our AI innovators with layers of red tape would diminish domestic entrepreneurialism and investment, deny citizens many life-enriching innovations, and limit economic growth. Equally worrisome is how overregulation could undermine our technology base and potentially even our national security.

Mountains of Red Tape

Unfortunately, many lawmakers seem oblivious to these dangers, floating extreme AI proposals premised on far-fetched hypotheticals and dystopian sci-fi plots. Such fear-based thinking has led states to propose far-reaching controls on algorithmic technologies. Colorado just became the first state to advance a comprehensive AI regulatory measure, which Gov. Jared Polis (D) signed even though he worried state regulations like his could create "a complex compliance regime for all developers and deployers of AI" and a patchwork of mandates that will "tamper innovation and deter competition." California is also rapidly advancing a major bill that would impose onerous restrictions on "frontier" AI models and create a new bureaucracy to administer the rules.

Overregulation also looms at the federal level, with more than 100 AI-related measures pending in Congress. The Biden administration is simultaneously pursuing unilateral regulation on AI through its "Blueprint for an AI Bill of Rights," a massive 110+ page executive order, and a litany of new agency directives premised on vague notions of "algorithmic fairness."

Most of these efforts are premised on the notion that government can preemptively legislate "responsible AI" by forcing innovators to run new ideas through a maze of bureaucrats to get a permission slip before innovating. Earlier this year, a top Biden administration tech official called for "a system of AI auditing from the government," and suggested the need for "an army of auditors" to ensure "algorithmic accountability." The resulting layers of technocratic meddling could lead to a death-by-a-thousand-cuts scenario for AI developers.

Undermining a Winning Formula

This is the exact opposite of the more flexible, market-driven approach the Clinton administration and Congress wisely crafted in the 1990s for the internet, digital commerce, and online speech. Rooted in policy restraint, that framework protected the freedom to innovate without first needing some bureaucrat's blessing to launch the next great application or speech platform.

If American innovators and values are to shape today's most important technology, we must not shoot ourselves in the foot as the global AI race heats up. Congress should pause overzealous micromanagement before it is too late. In the past, lawmakers have used forbearance requirements and moratoriums to protect innovation and competition, albeit to varying effect.

The Telecommunications Act of 1996 specified that "[n]o State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service." The law included other specific preemptions of state and local regulation, as well as a provision requiring the Federal Communications Commission (FCC) and state regulators to forbear from regulating in certain instances to enhance competition.

Another portion of the Communications Act meant to "encourage the provision of new technologies and services to the public" specifies that any party who opposes innovations "shall have the burden to demonstrate that such proposal is inconsistent with the public interest" and forces the FCC to make a decision within a year. Sadly, the FCC mostly ignores both this provision and the Telecom Act's forbearance requirements, continuing to overregulate communications and media markets instead.

Federal moratoria have been more effective in protecting new technologies from bureaucratic meddling and excessive taxes. Congress passed the Internet Tax Freedom Act of 1998 (made permanent in 2016) to contain the spread of "multiple and discriminatory taxes on electronic commerce" and internet access. Similarly, the Commercial Space Launch Amendments Act of 2004 made sure federal regulators did not undermine the nascent market for commercial human spaceflight.

How to Structure an AI Moratorium and Preemption

These and other laws could provide a template for how to craft a moratorium or preemption for AI regulation. An AI learning period moratorium should block the establishment of any new general-purpose AI regulatory bureaucracy, disallow new licensing schemes, block open-ended algorithmic liability, and preempt confusing state and local regulatory enactments that interfere with the establishment of a competitive national marketplace in advanced algorithmic services.

An AI learning period moratorium would have many benefits. First, it would create breathing space for new types of algorithmic innovation to grow. This is especially important for smaller AI firms and the open-source AI marketplace, both of which could be decimated by premature overregulation of a still-developing sector.

Second, an AI regulatory moratorium would give policymakers and technology experts the chance to determine what problems deserve greater scrutiny and potential regulation. This pragmatic policy approach would limit damage from rash decisions and help us gain knowledge by testing predictions and policies before advancing new rules.

A learning period moratorium on new AI regulations does not mean zero regulation, however. Many existing laws and regulations already cover any AI-enabled practices that violate civil rights, consumer protections, the environment, intellectual property, and national security. Policymakers can still enforce those policies where harms exist and fill gaps as necessary, or they can use less restrictive approaches like transparency and education-based measures.

A federal AI preemption standard will need to include carve-outs for some areas of traditional state authority including education, insurance, and law enforcement. But regulatory preemption will be challenging because, as the "most important general-purpose technology of our era," AI touches almost every field. For better or worse, some sectors and issues must be left to the province of state and local governments.

Where a national framework proves untenable, state and local governments should craft harmonized light-touch frameworks—perhaps in the form of multistate compacts—to avoid burdening the development of a robustly competitive and innovative national marketplace in AI firms and technologies.

Review Existing Regulatory Capacity

When formulating an AI moratorium, Congress should simultaneously demand that our government's 439 federal departments be required to do two other things. First, agencies should study and review existing policies that might already address algorithmic innovation in their field and consider how AI systems might already be overregulated under current law. Second, agencies should identify additional ways in which AI technologies might help improve government services. (It would be wise for state and local governments to engage in a similar review, although it need not be mandated by federal law).

The Trump administration's Office of Management and Budget (OMB) recommended some of these ideas to agency heads in a November 2020 guidance memo. "Federal agencies must avoid regulatory or non-regulatory actions that needlessly hamper AI innovation and growth," the OMB memo ordered. "Fostering AI innovation and growth through forbearing from new regulation may be appropriate," and "agencies must avoid a precautionary approach that holds AI systems to an impossibly high standard such that society cannot enjoy their benefits and that could undermine America's position as the global leader in AI innovation."

Unfortunately, in the wake of recent Biden administration orders and statements, agencies have instead been encouraged to consider how to expand their regulatory ambitions toward AI, even though Congress has not authorized such actions.

Conclusion

For the United States to remain the global leader in algorithmic technologies and computational capabilities, AI policy must be rooted in patience and humility rather than a rush to overregulate. Policymakers must avoid locking down America's innovative potential and instead pause the panic-based AI regulatory policies under consideration today.

It is essential that our nation get the policy prerequisites of growth and prosperity right by once again embracing an innovation culture that positions us as the global leader in advanced computation as the next great technological race with China and the rest of the world heats up.