

*Testimony before the House Budget Committee
“Machines, Artificial Intelligence, & the Workforce:
Recovering & Readyng Our Economy for the Future”*

by

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Chairman Yarmuth, Ranking Member Womack, members of the committee: Good afternoon, and thank you for the opportunity to talk with you today. I’m the founder and director of the Center for Security and Emerging Technology (CSET), a think tank at Georgetown University, that studies the security implications of new technologies, with a focus on artificial intelligence. I also serve as a Commissioner on the National Security Commission on Artificial Intelligence, to which I was appointed by the Senate Select Committee on Intelligence in 2018. I previously worked on similar topics in the federal government as Assistant Director of National Intelligence, and Director of the Intelligence Advanced Research Projects Activity.

In the next few minutes, I’ll make four points that I hope we’ll return to during the Q&A. They concern the benefits of AI as a general purpose technology, the sources of U.S. leadership in AI, the federal government’s role in supporting the private sector, and the importance of microelectronics.

First, AI is a general purpose technology with a broad range of potential applications in healthcare, agriculture, energy, transportation, national security, and scientific discovery. Advances in AI are likely to be applied across many sectors of the economy, spurring growth and enabling new technologies. Policies to strengthen U.S. leadership in AI have enjoyed bipartisan support during the decade that I’ve worked on the topic. I worked on AI strategies for both the current administration and the last administration, and there are more similarities than there are differences. Both administrations emphasized the points I’ll make here today, and each had a positive outlook on the potential for AI to improve American health and prosperity. As Michael Kratsios, the Chief Technology Officer of the United States, has said, “Our future rests on getting AI right. AI will support the jobs of the future.”¹ Jason Furman, previous Chair of the Council of Economic Advisors, has said, “the biggest worry I have about it [AI]: that we do not

¹ Michael Kratsios, Remarks at the Center for Data Innovation Forum on AI, September 18, 2019, Washington, DC, <https://www.datainnovation.org/2019/09/remarks-by-michael-kratsios-u-s-cto-at-center-for-data-innovation-forum-on-ai/>

have enough of AI.”² While AI will cause changes to the labor market, this has been true of every technology since the Industrial Revolution, and this country has adapted. I believe we will adapt to AI. We’ll be helped by more economic research on the likely effects of AI and automation, and by benchmarking to assess progress in various applications of AI.

Second, the United States is in a strong position—by most measures, we lead the world in AI.³ Our lead is due to key structural advantages:

- We have an open society that attracts the world’s top scientists and engineers. National Science Foundation data show that over half of the master’s- and PhD-level computer scientists employed in the United States were born abroad.⁴
- We have a competitive private sector that spurs innovation.
- We maintain strong international partnerships—while the US, alone, funds only 28% of global R&D, with our allies we fund more than half.⁵

We should double down on these strengths:

- We should ensure that we remain an attractive destination for global talent by broadening and accelerating the pathways to permanent residency for scientists and engineers.⁶ Most research suggests that increases in high-skilled immigration yield increases in jobs and wages for Americans, due to immigrants’ contributions to economic growth and the creation of new companies.⁷
- We should ensure that small- and mid-sized businesses have access to the computing power needed for AI applications. We can leverage the purchasing power of the federal government to buy commercial cloud computing credits in the private market and award

² Jason Furman, “Is This Time Different? The Opportunities and Challenges of Artificial Intelligence,” Remarks at *AI Now: The Social and Economic Implications of Artificial Intelligence Technologies in the Near Term*, July 7, 2016, New York, NY,

https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160707_cea_ai_furman.pdf

³ See, for example, Saurabh Mishra, et al., “The AI Index: Global AI Vibrancy Tool” (Stanford University, 2019), <http://vibrancy.aiindex.org/>; Daniel Castro, Michael McLaughlin, and Eline Chivot, “Who Is Winning the AI Race: China, the EU or the United States?” (Center for Data Innovation, August 2019),

<https://www.datainnovation.org/2019/08/who-is-winning-the-ai-race-china-the-eu-or-the-united-states/>; Andrew Haynes and Luke Gbedemah, “The Global AI Index” (Tortoise, December 2019),

<https://www.tortoisemedia.com/intelligence/ai/>; Jeff Ding, “Deciphering China’s AI Dream” (Centre for the Governance of AI, Future of Humanity Institute, University of Oxford, March 2018),

https://www.fhi.ox.ac.uk/wp-content/uploads/Deciphering_Chinas_AI-Dream.pdf

⁴ Remco Zwetsloot, Roxanne Heston, and Zachary Arnold, “Strengthening the U.S. AI Workforce” (Center for Security and Emerging Technology, September 2019),

<https://cset.georgetown.edu/research/strengthening-the-u-s-ai-workforce/>

⁵ Melissa Flagg, “Global R&D and a New Era of Alliances” (Center for Security and Emerging Technology, June 2020), <https://cset.georgetown.edu/research/global-rd-and-a-new-era-of-alliances/>

⁶ Zachary Arnold, Roxanne Heston, Remco Zwetsloot and Tina Huang, *Immigration Policy and the U.S. AI Sector* (Center for Security and Emerging Technology, September 2019),

<https://cset.georgetown.edu/research/immigration-policy-and-the-u-s-ai-sector/>

⁷ William Kerr, *The Gift of Global Talent: How Migration Shapes Business, Economy & Society* (Stanford Business Books, 2018)

them through federal grants and contracts, as the National Science Foundation has done through its CloudBank program.

- We should strengthen our alliances⁸ and foster the responsible use of AI through organizations such as the Global Partnership on AI, of which the United States was a founding member.

China has made extraordinary technological progress in recent decades, and its future prospects should not be underestimated. But U.S. policy should be based on an appreciation of the strengths that have driven our leadership in AI thus far, and how they can be leveraged in the future. Imitating China is not a winning strategy. Instead, as writer and scholar James Fallows recommended, “We should be more like us.”

Third, while our private sector leads in AI, the federal government plays a key supporting role. Federal research funding laid the foundation for the current wave of AI progress. Federal funding should continue to focus on areas where the private sector is likely to underinvest, including basic research, safety and security, testing and evaluation, and verification and validation. The National Institute for Standards and Technology (NIST) should be given the resources needed to lead interagency and public-private collaborations on AI testing and evaluation, including establishment of a national AI test bed—a digital platform containing public and non-public datasets, code, and testing environments on which AI systems can be developed, stored, and tested.

Fourth and last, the United States should ensure that it has access to leading-edge microelectronics. This country is the birthplace of microelectronics, and we continue to design most of the world’s leading-edge systems, but most devices are now manufactured elsewhere. Offshoring most of our semiconductor industry has increased the risk of supply chain disruptions during crises. The United States should strengthen U.S.-based semiconductor manufacturing to reduce supply chain risks and create high-quality jobs at home. At the same time, we should work with our allies to ensure that democracies remain at the leading edge of microelectronics by investing in joint research programs and by enforcing multilateral export controls on the semiconductor manufacturing equipment needed to produce advanced chips.⁹ The United States and our allies produce more than 90% of this equipment, so we are in a strong position. Legislation, including bipartisan proposals such as the CHIPS for America Act and American Foundries Act, can help maintain our position.

⁸ Andrew Imbrie, Ryan Fedasiuk, Catherine Aiken, Tarun Chhabra and Husanjot Chahal, *Agile Alliances: How the United States and Its Allies Can Deliver a Democratic Way of AI* (Center for Security and Emerging Technology, February 2020), <https://cset.georgetown.edu/research/agile-alliances/>

⁹ Saif Khan and Carrick Flynn, “Maintaining China’s Dependence on Democracies for Advanced Computer Chip” (Brookings Institution and Center for Security and Emerging Technology, April 2020), <https://cset.georgetown.edu/research/maintaining-chinas-dependence-on-democracies-for-advanced-computer-chips/>

With these four points on the benefits of AI as a general purpose technology, the sources of U.S. leadership in AI, the federal government's role in supporting the private sector, and the importance of microelectronics, I thank the Committee for the opportunity to speak with you today. I look forward to your questions.