Congress of the United States
Washington, DC 20515

March 13, 2020

The Honorable José Serrano,
Chairman
Subcommittee on Commerce, Justice,
Science, and Related Agencies
H-310 The Capitol
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Robert Aderholt,
Ranking Member
Subcommittee on Commerce, Justice,
Science, and Related Agencies
1016 Longworth House Office Building
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairman Serrano and Ranking Member Aderholt,

As you begin to craft the Fiscal Year 2021 Commerce, Justice, Science, and Related Agencies appropriations bill, we urge you to provide robust funding to the National Science Foundation (NSF) for nondefense artificial intelligence (AI) research and development (R&D).

AI will revolutionize many aspects of our lives, yet I'm concerned that the U.S. is not investing enough to retain our country's lead in AI. The President's budget proposal includes a substantial increase to nondefense AI R&D to a total of $1.1 billion. Yet this sum is still far too small for what's needed. Even with this increase, the municipal government of Shanghai has committed to invest more in nondefense AI R&D than the entire U.S. federal government.[1]

AI is already shaping our lives in myriad ways including financial fraud monitoring, email spam filtering, voice assistant interfaces, content recommendations, e-commerce, driving directions, language translation, and so many other fields.[2] AI will also transform many other domains, including autonomous vehicles, precision agriculture, and personalized medicine. While entrepreneurs will develop the products and services that improve our lives, tech innovators in the private sector stand on the shoulders of government R&D. For example, the federal government funded the early internet,[3] continues to fund the Global Positioning System (GPS),[4] and played a critical role in the research behind many of the individual components of the iPhone.[5]

The President's proposal to increase AI R&D is directionally correct, but it significantly underestimates the investment we need. The President proposes doubling nondefense AI R&D by 2022, including $830 million for the NSF. The Chinese government spent as much as $8.4 billion on AI R&D in 2018.[6] In Europe, the European Commission is investing $1.7 billion per year,[7] Germany committed $3.3 billion in 2018, and France will invest $1.7 billion this year.[8]

Our country is the world's leader in AI *despite* our failure to invest the necessary R&D dollars. The Global AI Index, which aims to quantify the AI arms race among nations, finds that the U.S. is ahead of China today but "on current growth experts predict China will overtake the U.S. in just five to 10 years."[9] Researchers in China and Europe each publish more peer-reviewed AI journal and conference papers than those in the U.S. [10]

Investing more in AI R&D has broad support. Eric Schmidt, the former CEO of Google, argued for increased government spending on AI R&D in a recent *New York Times* Op-Ed.[11] In 2016, Jason Furman, then the Chairman of the Council of Economic Advisers, said that his biggest worry about AI was "that we do not have enough of AI" for our country to realize potential economic gains from AI.[12] Professor Furman was right then, and his words still ring true today.

While we support the President's push to increase AI R&D investments, we do not support reducing R&D investments in other areas, as the President's budget proposes. Federal R&D spending as a share of our gross domestic product has been in decline for decades.[13] We need to increase AI R&D by expanding all of our R&D investments, not by shifting from other priorities.

For these reasons we ask that you provide robust funding to the NSF for AI R&D, well in excess of the President's budget.

Most gratefully,

Anna G. Eshoo
Member of Congress

Additional Signatories

Bill Foster

Donald S. Beyer Jr.

G. K. Butterfield

Debbie Dingell

Rick Larsen

Steven Horsford

Jimmy Gomez

Jimmy Panetta

Robin L. Kelly

Elissa Slotkin

Seth Moulton

Ro Khanna

Abigail D. Spanberger

Henry C. "Hank" Johnson, Jr.

Ted S. Yoho, DVM

Emanuel Cleaver, II

John Yarmuth

[1] He Wei, "Shanghai Launches AI Investment Fund," *China Daily*, Augu 31, 2019, http://www.chinadaily.com.cn/a/201908/31/WS5d6a6bd3a310cf3e35568fc9.html. (10 billion yuan converts to $1.42 billion and 100 billion yuan converts to $14.2 billion based on the market currency conversion rate on February 20, 2020)

[2] *See e.g.,* Bernard Marr, "The 10 Best Examples Of How AI Is Already Used In Our Everyday Life," *Forbes*, December 18, 2019, https://www.forbes.com/sites/bernardmarr/2019/12/16/the-10-best-examples-of-how-ai-is-already-used-in-our-everyday-life/#785e640c1171.

[3] H. Res. 717, 116th Cong. (2019)

[4] "Fiscal Year 2020 Program Funding," GPS.gov, February 7, 2020, https://www.gps.gov/policy/funding/2020/. ("On December 20, 2019, President Trump signed the Consolidated Appropriations Act, 2020, an omnibus funding measure that provides $1.71 billion to the Air Force GPS program in FY 2020.")

[5] Mariana Mazzucato, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths:* (PublicAffairs, 2015), chap. "The State behind the iPhone." (The federal government had a role in funding research behind the lithium-ion battery, liquid-crystal display, micro hard drive, microprocessor, multi-touch screen, and Siri voice assistant.)

[6] Ashwin Acharya and Zachary Arnold, "Chinese Public AI R&D Spending: Provisional Findings" (Center for Security and Emerging Technology, December 2019), https://cset.georgetown.edu/wp-content/uploads/Chinese-Public-AI-RD-Spending-Provisional-Findings-1.pdf.

[7] "On Artificial Intelligence - A European Approach to Excellence and Trust" (European Commission, February 19, 2020), https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf. (€1.5 converts to $1.678 billion based on the market currency conversion rate on March 5, 2020)

[8] Laurie Harris, "Artificial Intelligence: An Overview of Technologies and Issues for Congress" (Congressional Research Service, January 27, 2020).

[9] Alexandra Mousavizadeh, Alexi Mostrous, and Alex Clark, "The Global AI Index: The Arms Race" (The Global AI Index, Tortoise Intelligence, December 3, 2019), https://members.tortoisemedia.com/2019/12/03/global-ai-index/content.html.

[10] Raymond Perrault et al., "The AI Index 2019 Annual Report" (AI Index Steering Committee, Human-Centered AI Institute, Stanford University, December 2019), https://hai.stanford.edu/sites/g/files/sbiybj10986/f/ai_index_2019_report.pdf.

[11] Eric Schmidt, "I Used to Run Google. Silicon Valley Could Lose to China," *New York Times*, 2-27-20200, https://www.nytimes.com/2020/02/27/opinion/eric-schmidt-ai-china.html.

[12] Jason Furman, "Is This Time Different? The Opportunities and Challenges of Artificial Intelligence," 2016, https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160707_cea_ai_furman.pdf.

[13] Matt Hourihan and David Parkes, "Federal R&D Budget Trends: A Short Summary" (American Association for the Advancement of Science, January 2019), https://www.aaas.org/sites/default/files/2019-01/AAAS%20RD%20Primer%202019_2.pdf.