COMMITTEE ON
SCIENCE, SPACE AND TECHNOLOGY
CHAIRMAN BRIAN BABIN

SUBCOMMITTEE ON RESEARCH AND TECHNOLOGY

HEARING CHARTER

"*DeepSeek: A Deep Dive*"

April 8, 2025
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

Purpose

The purpose of the hearing is to understand the impact of DeepSeek's recent V3 and R1 Artificial Intelligence (AI) models on the United States' (U.S.) national security and technological competitiveness. The hearing will examine how DeepSeek's models were developed, their capabilities compared to American AI models, and their use of American technology in their advancement. We will also discuss the broader state of U.S. and Chinese Communist Party (CCP) strategic competition in AI, how DeepSeek's open-weight models affect U.S. technological competitiveness globally, and what opportunities and challenges exist for U.S. innovation and leadership in AI at both the federal and private sector levels.

Witnesses

- **Mr. Adam Thierer**, Resident Senior Fellow, Technology and Innovation, R Street Institute
- **Mr. Gregory Allen**, Director, Wadhwani Center for AI & Advanced Technologies, Center for Strategic and International Studies
- **Dr. Julia Stoyanovich**, Institute Associate Professor of Computer Science & Engineering, Tandon School of Engineering; Associate Professor of Data Science, Center for Data Science; Director, Center for Responsible AI, New York University
- **Mr. Tim Fist**, Director of Emerging Technology Policy, Institute for Progress

Key Questions

1. How do DeepSeek's recent AI models affect AI accessibility for Americans and U.S. innovations in AI?
2. How do DeepSeek's models compare to American models regarding accessibility, transparency, and security?

3. What are the implications for U.S. technological leadership and national security if CCP AI models, such as DeepSeek, have access to data from American users? How can the U.S. ensure that American usage of AI models does not compromise U.S. security or global leadership?
4. What are the consequences for America's technological leadership if U.S. open-weight models fall behind CCP open-weight models, given the CCP's investment in AI research, commercialization, and the growing global adoption of open-weight AI models?
5. What role should the federal government play in bridging gaps in private sector research and development (R&D) to promote the advancement of American AI models, ensure the security of American AI models, and protect the personal data of American consumers?

Background

The United States is a global leader in artificial intelligence (AI). When developed and deployed with care, AI holds the potential to significantly enhance the quality of life, health, security, and economic prosperity of Americans for many years to come. Our nation leads in AI research, the number of AI companies, private sector investment, and the industry's adoption of AI.[1] This leadership stems from a thriving innovation ecosystem in the United States, which allows our country to lead the world in the responsible design, development, and deployment of AI.

DeepSeek

DeepSeek is an AI company owned by the Chinese high-frequency trading company, High-Flyer,[2] and was established in December 2023 by High-Flyer CEO Liang Weneng.[3]

Before its most recent models, DeepSeek released several open-weight AI models throughout 2024, including a large language model and chatbot called DeepSeek LLM in January 2024,[4] a model specialized in coding called DeepSeek Coder in January 2024,[5] and a model specialized in mathematics called DeepSeekMath in February 2024.[6]

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[1] Stanford Institute for Human-Centered Artificial Intelligence, Artificial Intelligence Index Report 2024, April 15, 2024; accessed at https://hai-production.s3.amazonaws.com/files/hai_ai-index-report-2024-smaller2.pdf

[2] Shen, Samuel and Ranganathan, Vidya, After DeepSeek, Chinese fund managers beat High-Flyer's path to AI, March 13, 2025; accessed at https://www.msn.com/en-gb/money/technology/after-deepseek-chinese-fund-managers-beat-high-flyers-path-to-ai/ar-AA1ATj3x

[3] Ng, Kelly, Drenon, Brandon, Gerken, Tom, and Cieslak, Marc, DeepSeek: The Chinse AI app that has the world talking, February 4, 2025, accessed at https://www.bbc.com/news/articles/c5yv5976z9po

[4] Bi, Xiao, et al., Deepseek llm: Scaling open-source language models with longtermism, January 4, 2024; accessed at https://arxiv.org/abs/2401.02954

[5] Guo, Daya, et al., DeepSeek-Coder: When the Large Language Model Meets Programming--The Rise of Code Intelligence, January 26, 2024; accessed at https://arxiv.org/abs/2401.14196

[6] Shao, Zhihong, et al, DeepSeekMath: Pushing the Limits of Mathematical Reasoning in open language models; April 27, 2024; accessed at https://arxiv.org/abs/2402.03300

On December 27, 2024, DeepSeek released its DeepSeek-V3 model, which was distilled from (i.e., trained to mimic the behavior of) the more powerful DeepSeek-R1 model, which had not yet been released.[7] Then, on January 20, 2025, DeepSeek released its DeepSeek-R1 model along with a chatbot application.[8] Within one week of the DeepSeek application becoming available for free, DeepSeek had overtaken ChatGPT to become the top-rated free application available on the Apple App Store in the United States.[9] In the same week, DeepSeek announced it would temporarily limit user registrations "due to large-scale malicious attacks" on its services.[10] On March 25, 2025, DeepSeek released an update to the V3 model to improve its reasoning and coding capabilities.[11]

DeepSeek has faced criticism for alleged censorship in both its responses and the data used for its training. Critics argue that it suppresses certain viewpoints or information, raising concerns about transparency and bias.[12] Additionally, NASA, the U.S. Navy, and the Taiwanese government have banned the use of DeepSeek from government systems, citing significant privacy concerns that DeepSeek's data collection and processing practices could lead to unauthorized access or misuse of sensitive information, potentially infringing on personal privacy.[13] The White House is reportedly considering banning DeepSeek from government devices.[14]

On February 6, 2025, Representatives Josh Gottheimer and Darin La Hood introduced legislation that would ban the use and download of DeepSeek's models from government devices.[15]

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[7] Liu, Aixin, et al., Deepseek-v3 technical report, February 18, 2025; accessed at https://arxiv.org/abs/2412.19437
[8] Guo, Daya, et al., Deepseek-r1: Incentivizing reasoning capability in llms via reinforcement learning, January 22, 2025; accessed at https://arxiv.org/abs/2501.12948
[9] Field, Hayden, China's DeepSeek AI dethrones ChatGPT on App Store: Here's what you should know, January 27, 2025; accessed at https://www.cnbc.com/2025/01/27/chinas-deepseek-ai-tops-chatgpt-app-store-what-you-should-know.html
[10] Field, Hayden, DeepSeek hit with large-scale cyberattack, says it's limiting registrations, January 27, 2025; accessed at https://www.cnbc.com/2025/01/27/deepseek-hit-with-large-scale-cyberattack-says-its-limiting-registrations.html
[11] Reuters, China's DeepSeek releases AI model upgrade, intensifies rivalry with OpenAI, March 25, 2025; accessed at https://www.reuters.com/technology/artificial-intelligence/chinas-deepseek-releases-ai-model-upgrade-intensifies-rivalry-with-openai-2025-03-25/
[12] Yang, Zeyi, Here's How DeepSeek Censorship Actually Works—and How to Get Around It, January 31, 2025; accessed at https://www.wired.com/story/deepseek-censorship/
[13] Williams, Kevin, Chinese AI app DeepSeek was downloaded by millions. Deleting it might come next, February 2, 2025; accessed at https://www.cnbc.com/2025/02/02/why-deleting-chinas-deepseek-ai-may-be-next-for-millions-of-americans.html
[14] Lin, Liza, U.S. Likely to Ban Chinese App DeepSeek From Government Devices, March 7, 2025; accessed at https://www.wsj.com/tech/u-s-likely-to-ban-chinese-app-deepseek-from-government-devices-09c2b439
[15] RELEASE: Gottheimer, LaHood Introduce New Bipartisan Legislation to Protect Americans from DeepSeek, February 6, 2025; accessed at https://gottheimer.house.gov/posts/release-gottheimer-lahood-introduce-new-bipartisan-legislation-to-protect-americans-from-deepseek [16] *Supra* note 7.

Cost of DeepSeek's Models and American Resources Used

There are several claims surrounding the resources invested in training DeepSeek-R1. DeepSeek claims that V3 cost less than $5.6 million and took under two months to train.[16] DeepSeek later clarified this $6 million figure only included "official training" and excluded costs tied to "prior research and ablation experiments on architectures, algorithms, or data."[17] DeepSeek also wrote that they distilled their V3 model off of their more advanced R1 model,[18] Despite that, the $5.6 million figure does not account for the cost of R1, and DeepSeek did not release the cost of training for R1.[19]

In addition, OpenAI claims they found evidence that DeepSeek distilled OpenAI's models through their Application Programming Interface (API) to train their own models.[20] By comparison, OpenAI's CEO, Sam Altman, claimed that over $100 million has been invested in training GPT-4.[21]

SemiAnalysis, a semiconductor research and consulting firm, claimed that the $5.6 million figure was only for pre-training (training the initial version of the model), which is "nowhere [near] the actual amount spent on the model."[22] They further claim that DeepSeek spent over $2.5 billion on purchasing American NVIDIA semiconductor chips.[23] SemiAnalysis also points out that generating synthetic data (specialized AI-generated outputs used to train an AI model) for training its model would have required "a significant amount of compute."[24]

Export Controls

Since 2022, the U.S. Department of Commerce's Bureau of Industry and Security (BIS) has imposed export controls on various advanced chips used to develop cutting-edge AI, restricting their export to the CCP and other countries.[25] Before the release of DeepSeek-V3, CEO Liang Wenfeng claimed that these export controls were DeepSeek's biggest hurdle, stating, "[m]oney has never been the problem for us; bans on shipments of advanced chips are the problem."[26]

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[16] *Supra* note 7.
[17] Field, Hayden, DeepSeek's hardware spend could be as high as $500 million, new report estimates, January 31, 2025; accessed at https://www.cnbc.com/2025/01/31/deepseeks-hardware-spend-could-be-as-high-as-500-million-report.html
[18] *Supra* note 7.
[19] Supra note 8.
[20] Weatherbed, Jess, OpenAI has evidence that its models helped train China's DeepSeek, January 29, 2025; accessed at https://www.theverge.com/news/601195/openai-evidence-deepseek-distillation-ai-data
[21] Knight, Will, OpenAI's CEO says the Age of Giant AI Models Is Already Over, April 17, 2023; accessed at https://www.wired.com/story/openai-ceo-sam-altman-the-age-of-giant-ai-models-is-already-over/
[22] Patel, Dylan, Kourabi, AJ, O'Laughlin, Doug, and Knuhtsen, Reyk, DeepSeek Debates: Chinese Leadership On Cost, True Training Cost, Closed Model Margin Impacts, January 31, 2025; accessed at https://semianalysis.com/2025/01/31/deepseek-debates/
[23] *Id.*
[24] *Id.*
[25] Allen, Gregory, Understanding the Biden Administration's Updated Export Controls, December 11, 2024; accessed at https://www.csis.org/analysis/understanding-biden-administrations-updated-export-controls
[26] Schneider, Jordan et al., DeepSeek: The Quiet Giant Leading China's AI Race, November 27, 2024; accessed at

In its technical report on the smaller V3 model, DeepSeek describes using 2,048 NVIDIA H800 chips.[27] In October 2022, BIS export-controlled NVIDIA H100s from being sold to China, and in March 2023, NVIDIA released the H800 chip, which was designed to fall right under BIS's export control threshold.[28] BIS later export-controlled this chip in October 2023, providing a 5-month period for CCP firms to potentially buy the chip legally. SemiAnalysis's report claims that DeepSeek had purchased 10,000 H100s (which BIS export-controlled in October 2022), 10,000 H800s (which BIS export-controlled in October 2023), and 20,000 NVIDIA H20s (which the administration is reportedly considering imposing export controls on[29]).[30]

Despite facing numerous challenges in overtaking the United States, export controls by the U.S. and its allies have led to increased spending in China's domestic semiconductor industry and rapid development.[31] However, due to export controls on American tools for producing advanced chips, China's top logic chip manufacturer, Semiconductor Manufacturing International Corporation has been stuck at making 7 nanometer chips, with a relatively poor yield of 20%.[32] On the other hand, Taiwan Semiconductor Manufacturing Company (TSMC) manufactured 7 nanometer chips for NVIDIA and Apple as early as 2020 with much higher yield rates and has already begun manufacturing more advanced 4 nanometer chips in Arizona.[33] [34]

To conclude, DeepSeek has openly admitted to using American chips that were export controlled in 2023, which they may have purchased before the export controls, and DeepSeek reportedly also had access to American chips that they likely would have illegally purchased after export controls were implemented in 2022.

U.S.-PRC Competitiveness

There is global competition to lead in foundational AI research and commercial applications. The United States maintains its position as the leader in fundamental research and standards, consistently producing advanced AI applications, ahead of other countries. However, according to the 2024 National Science Board Science and Engineering Indicators report, competitor nations, such as China, are rapidly surpassing the world in highly cited and collaborative R&D.[35]

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https://www.chinatalk.media/p/deepseek-ceo-interview-with-chinas

[27] *Supra* note 7

[28] Nellis, Stephen and Lee, Jane, Nvidia tweaks flagship H100 chip for export to China as H800, March 21, 2023; accessed at https://www.reuters.com/technology/nvidia-tweaks-flagship-h100-chip-export-china-h800-2023-03-21/

[29] Reuters, Trump officials discussing tightening curbs on Nvidia's China sales, sources say, January 30, 2025; accessed at https://www.scmp.com/tech/tech-war/article/3296754/trump-officials-discussing-tightening-curbs-nvidias-china-sales-sources-say

[30] *Supra* note 22.

[31] Kubota, Yoko, The Goal for China's Chip Giant: Cut Out the U.S., June 3, 2024; accessed at https://www.wsj.com/tech/chinese-semiconductor-industry-smic-self-sufficient-5210abf8

[32] Allen, Greg, DeepSeek, Huawei, Export Controls, and the Future of the U.S.-China AI Race, March 7, 2025; accessed at https://www.csis.org/analysis/deepseek-huawei-export-controls-and-future-us-china-ai-race

[33] *Id*.

[34] Shepardson, David, TSMC begins producing 4-nanometer chips in Arizona, Raimondo says, January 10, 2025; accessed at https://www.reuters.com/technology/tsmc-begins-producing-4-nanometer-chips-arizona-raimondo-says-2025-01-10/

[35]National Science Board, National Science Foundation, Science and Engineering Indicators 2024: The State of U.S.

The CCP is working to strengthen its AI workforce to compete with the United States and has developed AI talent in part due to substantial investments in AI education. For example, since 2018, the CCP has established over 2,000 undergraduate AI programs across more than 300 of its top universities.[36] However, when it comes to adopting AI innovations at scale in academia and industry, a recent study highlights a significant "diffusion deficit" between the United States and China in AI.[37]

The United States' total AI R&D growth over the last decade has greatly benefited from contributions made by industry. While nonprofits and academia have contributed to this growth, building cutting-edge AI systems requires large amounts of data, computing power, and financial resources, and industry members, especially large firms, tend to have greater access to these resources. According to the Stanford University AI Index Report 2024, private U.S. businesses invested $67.2 billion in 2023, roughly 8.7 times the amount invested by the next highest country's private industry (the CCP at $7.8 billion).[38] The most recent estimate of total U.S. federal R&D spending on AI was $2.9 billion in 2023.[39] A 2019 report from the Georgetown Center for Security and Emerging Technology estimates that China's R&D spending on AI in 2018 was somewhere between $2.0 and $8.4 billion.[40] China announced an $8.2 billion AI investment fund this year, although further details have not been released.[41]

AI is built upon the core pillars of algorithms, computing power (powered by semiconductors), and data.[42] AI systems use computing power "to execute algorithms that learn from data."[43] Each component drives advancements in AI, shaping both its capabilities and the infrastructure required to support it. Semiconductors are critical in the U.S.- CCP AI competition, essential for boosting processing speeds and powering complex AI tasks. The United States currently leads in advanced semiconductor technology.[44] According to an August 2024 report by the Information Technology and Innovation Foundation (ITIF), Chinese competitors are about five years behind in the high-volume manufacturing of advanced logic semiconductor chips, and they lag in memory chips and semiconductor manufacturing equipment.[45]

Science and Engineering, 2024; accessed at https://ncses.nsf.gov/pubs/nsb20243

[36] Mozur, Paul and Metz, Cade, In One Key A.I. Metric, China Pulls Ahead of the U.S.: Talent, March 22, 2024; accessed at https://www.nytimes.com/2024/03/22/technology/china-ai-talent.html

[37] Ding, Jeffrey, Explaining China's Diffusion Deficit, September 16, 2024; accessed at https://www.fpri.org/article/2024/09/explaining-chinas-diffusion-deficit/

[38] *Supra* note 1.

[39] Networking and Information Technology Research and Development, Artificial Intelligence R&D Investments ,Fiscal Year 2019 – Fiscal Year 2025, (n.d.); accessed at https://www.nitrd.gov/ai-rd-investments/

[40] Acharya, Ashwin and Arnold, Zachary, Chinese Public AI R&D Spending: Provisional Findings, December 2019; accessed at https://cset.georgetown.edu/wp-content/uploads/Chinese-Public-AI-RD-Spending-Provisional-Findings-1.pdf

[41] Verdict, China launches $8.2bn AI investment fund as US tightens trade controls, January 21, 2025; accessed at https://www.verdict.co.uk/china-launches-8-2bn-ai-fund/?cf-view

[42] Buchanan, Ben, The AI Triad and What It Means for National Security Strategy, August 2020; accessed at https://cset.georgetown.edu/publication/the-ai-triad-and-what-it-means-for-national-security-strategy/

[43] *Ibid*.

[44] Enzell, Stephen, How Innovative Is China in Semiconductors?, August 19, 2024; accessed at https://itif.org/publications/2024/08/19/how-innovative-is-china-in-semiconductors/

[45] *Id.*

The CCP has made investments in its domestic semiconductor industry to enhance its AI capabilities and reduce dependence on global supply chains. The rising demand for AI has increased the need for greater computing power, as training models require substantial data and compute-intensive resources from advanced semiconductors. Computing power refers to the national or company-level infrastructure, capabilities, and resources dedicated to computational power and data processing, including computing systems, data centers, cloud facilities, and networks for high-end tasks. The United States currently leads in computing power over the CCP, and some experts believe that preferential access to compute contributes to the dominance of U.S.-based companies in the global AI landscape.[46]

National Security Considerations

AI for National Security

The U.S. is using AI in its military to design new systems and improve planning and intelligence. Specifically, the Defense Innovation Unit's Replicator Initiative is using AI and robotics to develop thousands of autonomous systems at scale.[47] The Office of Naval Research (ONR) is integrating AI to optimize mission planning, monitor Navy platforms, and forecast possible enemy courses of action.[48]

Open-Weight Models

Open-weight models release the model weights (the parameters used to determine an AI system's outputs) for free, allowing users to run them on their devices at no cost and fine-tune (train on personalized data) them to fit their needs, often leading to greater adoption by scientists, academics, and businesses.[49] .[5051]

Applications built on DeepSeek or other future Chinese open-weight models would inherently promote CCP values, as required by Chinese AI regulations.[52] They could also contain hidden exploits that remain dormant until later, as demonstrated in a paper by Anthropic.[53],[54]

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[46] Triolo, Paul and Schaefer, Kendra, China's Generative AI Ecosystem in 2024, June 27, 2024; accessed at https://www.nbr.org/publication/chinas-generative-ai-ecosystem-in-2024-rising-investment-and-expectations/

[47] Kahn, Lauren, Scaling the future: How replicator aims to fast-track U.S. defense capabilities, September 23, 2023; accessed at https://warontherocks.com/2023/09/scaling-the-future-how-replicator-aims-to-fast-track-u-s-defense-capabilities/#:~:text=The%20U.S.%20Department%20of%20Defense,a%20path%20of%20risky%20incrementalism

[48] Office of Naval Research, (n.d.); accessed at https://www.onr.navy.mil/

[49]The Economist, Why open-source AI models are good for the world, November 7, 2024; accessed at https://www.economist.com/leaders/2024/11/07/why-open-source-ai-models-are-good-for-the-world

[50] Schmidt, Eric, Will China's open-source AI end U.S. supremacy in the field?, January 28, 2025; accessed at https://www.washingtonpost.com/opinions/2025/01/28/china-deekseek-ai-us-supremacy/

[51] Sim, Dewy, DeepSeek may give China the soft power edge it's looking for, particularly in Global South, February 16, 2025; accessed at https://www.scmp.com/news/china/diplomacy/article/3299018/deepseek-may-give-china-soft-power-edge-its-looking-particularly-global-south

[52] Kachra, Ashyana-Jasmine, Making Sense of China's AI Regulations, February 12, 2024; accessed at https://www.holisticai.com/blog/china-ai-regulation

[53] McCarthy, Simone, DeepSeek is giving the world a window into Chinese censorship and information control, January 29, 2025; accessed at https://www.cnn.com/2025/01/29/china/deepseek-ai-china-censorship-moderation-intl-hnk/index.html

[54] Hubinger, Evan, et al., Sleeper agents: Training deceptive llms that persist through safety training, January 17, 2024; accessed at https://arxiv.org/abs/2401.05566

Foreign analysts are already suggesting that developers in their countries may shift to building on DeepSeek's models. Meanwhile, CCP-affiliated companies have rapidly adopted DeepSeek's models, potentially leading to the global proliferation of DeepSeek-based applications.[55] This has led some to argue that U.S. leadership in open-weight models would benefit national security.[56]

Congressional and Executive Actions to Advance Competitiveness

In January, President Trump issued an executive order stating that the United States' policy is "to sustain and enhance America's global AI dominance in order to promote human flourishing, economic competitiveness, and national security."[57] In October 2024, President Biden issued a National Security Memorandum that included provisions to increase the adoption of AI by U.S. national security agencies and streamline processes to develop AI infrastructure, such as power plants and power transmission lines.[58]

The CHIPS and Science Act of 2022[59]

This legislation allocated $50 billion to the Department of Commerce to support advanced semiconductor manufacturing in the United States and to progress the government's research initiatives for another five years. Additionally, it authorized federal science agencies, including the National Science Foundation (NSF), the Department of Energy (DOE), the National Oceanic and Atmospheric Administration (NOAA), and the National Institute of Standards and Technology (NIST), to advance AI research and investigate its applications.

[55] Yeyati, Eduardo Levy and Guilera, Soledad, DeepSeek Reveals Latin America's AI Crossroads, February 19, 2025; accessed at https://americasquarterly.org/article/deepseek-reveals-latin-americas-ai-crossroads/

[56] Dunnmon, Jared, The Real Threat of Chinese AI, February 28, 2025; accessed at https://www.foreignaffairs.com/china/real-threat-chinese-ai

[57] Executive Order 14179: Removing Barriers to American Leadership in Artificial Intelligence, January 23, 2025; accessed at https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/

[58] Memorandum on Advancing the United States' Leadership in Artificial Intelligence; Harnessing Artificial Intelligence to Fulfill National Security Objectives; and Fostering the Safety, Security, and Trustworthiness of Artificial Intelligence, October 24, 2024; accessed at https://bidenwhitehouse.archives.gov/briefing-room/presidential-actions/2024/10/24/memorandum-on-advancing-the-united-states-leadership-in-artificial-intelligence-harnessing-artificial-intelligence-to-fulfill-national-security-objectives-and-fostering-the-safety-security/

[59] P.L. 117-167, CHIPS and Science Act, August 9, 2022; accessed at https://www.congress.gov/bill/117th-congress/house-bill/4346

National Artificial Intelligence Initiative Act of 2020[60]

This bipartisan legislation was signed into law in December 2021. This bill, led by the House Science, Space, and Technology Committee, marked the federal government's first step in implementing a national AI strategy. Major provisions included:

- Establishing the National AI Research Institutes program under the NSF. This initiative facilitates federal investment in public-private partnerships in AI research with real-world applications.
- Directing NIST to create an AI Risk Management Framework, a voluntary guide to help organizations integrate trustworthiness into designing, developing, using, and evaluating AI systems.
- Authorizing a task force to create a proposal for a National AI Research Resource (NAIRR), a federal computing resource designed to give university researchers access to computing power comparable to that of major AI labs like OpenAI.
- Establishing the National Artificial Intelligence Initiative Office within the White House Office of Science and Technology Policy (OSTP) to coordinate federal AI initiatives.
- Establishing the National Artificial Intelligence Advisory Committee (NAIAC) to advise the President and the National AI Initiative Office on how AI impacts economic competitiveness, ethics, education, and national security

National Artificial Intelligence Research Resource (NAIRR) Pilot Program

The NAIRR is a concept for shared AI research infrastructure initiative launched by the NSF, other federal agencies, and private sector and nonprofit organizations, with a pilot that began in January 2024.[61] The NAIRR pilot provides U.S.-based researchers and educators with essential resources for AI research and innovation, including advanced computing resources, datasets and models, software and training, and user support.[62][63] States are also exploring the creation of similar resources, such as CalCompute[64] in California and Empire AI in New York. [65]

[60] P.L. 116–283, William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021. December 31, 2020; accessed at https://www.congress.gov/bill/116th-congress/house-bill/6395

[61] National Science Foundation, Democratizing the Future of AI R&D: NSF to launch National AI Research Resource pilot, January 24, 2024; accessed at https://www.nsf.gov/news/democratizing-future-ai-rd-nsf-launch-national-ai

[62] National Science Foundation, National Artificial Intelligence Research Resource Pilot, (n.d.); accessed at https://www.nsf.gov/focus-areas/artificial-intelligence/nairr

[63]National Artificial Intelligence Research Resource Pilot, (n.d.); accessed at https://nairrpilot.org/

[64] Foster, Natalie, Cal Compute would make powerful AI available to all state residents, February 1, 2025; accessed at https://www.sandiegouniontribune.com/2025/02/01/cal-compute-would-make-powerful-ai-available-to-all-state-residents/

[65] Empire AI, (n.d.); accessed at https://www.empireai.tech/