



ARTIFICIAL INTELLIGENCE &
QUANTUM INFORMATION SCIENCE
R&D SUMMARY:
FISCAL YEARS 2020-2021

Report by

The White House

Office of Science and Technology Policy

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Executive Summary

Artificial intelligence (AI) and quantum information science (QIS) are key industries of the future that will power economic growth and strengthen national security for years to come. The Trump Administration recognizes the strategic importance of these emerging technologies and has taken decisive action to advance America’s AI and QIS leadership.

In February 2020, President Trump’s Fiscal Year (FY) 2021 Budget put the United States on a path to double Federal research and development (R&D) spending in nondefense AI and QIS by FY2022.

This report provides a summary of Federal R&D spending in nondefense artificial intelligence and quantum information science for Fiscal Years 2020 – 2021. It demonstrates that the Administration is well on its way to fulfilling the President’s request to double investment.

Nondefense AI and QIS R&D Summary: Fiscal Years 2020 - 2021

	FY2020 Budget Proposal*	FY2020 Enacted Estimate**	FY2021 Budget Proposal
Artificial Intelligence	\$973.5 Million	\$1.118 Billion	\$1.503 Billion
Quantum Information Science	\$435 Million***	\$579 Million	\$699 Million

**The FY2020 Budget Proposal is the baseline for the President’s doubling commitment.*

***The FY2020 enacted estimate is based upon FY 2020 appropriations from P.L. 116-93.*

****The FY2020 QIS Budget Proposal is comprised of funding from DoD, DOE, NIST, and NSF.*

Information in this report was compiled by the White House Office of Science and Technology Policy (OSTP), the Office of Management and Budget (OMB), the National Quantum Coordination Office (NQCO), and the Networking and Information Research and Development Program (NITRD).

Breakthroughs in AI and QIS R&D will lead to incredible advancements in health care, transportation, communications, agriculture, security, and many other sectors. The Trump Administration is committed to ensuring these innovations occur here in America through strategic R&D investment.

Importantly, America will maintain its global leadership in key technologies not through top-down government policies, but through our unparalleled innovation ecosystem where Federal agencies, the academic community, private sector innovators, and nonprofits each have a unique and necessary role, not to mention the synergistic effects of collaboration among these stakeholders.

Working together, the United States will continue to embrace innovation and accelerate the development of cutting edge technologies that help all Americans become more prosperous and live healthier, safer lives.

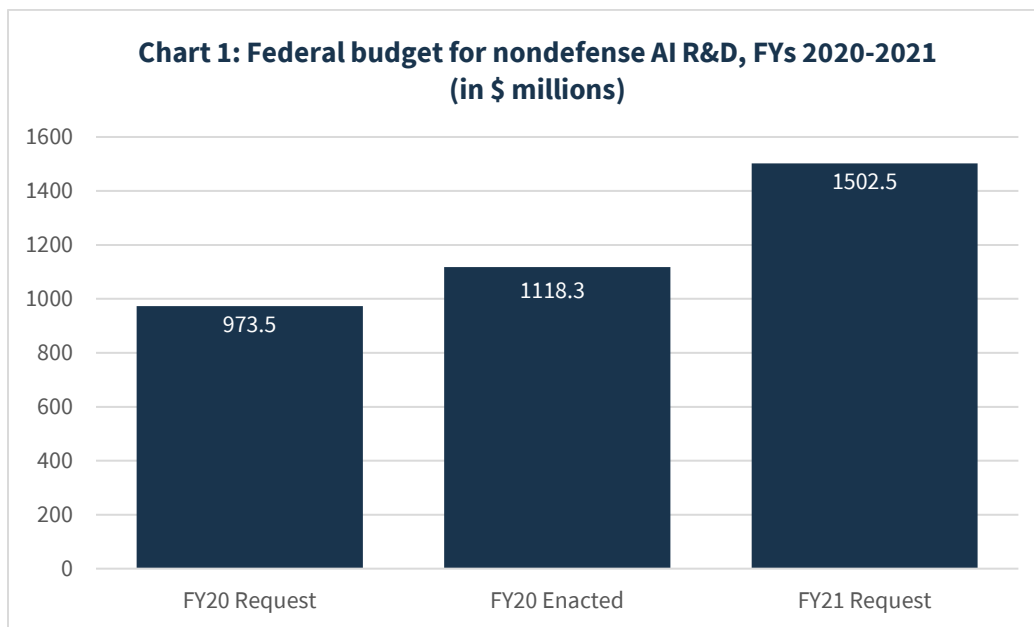
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Artificial Intelligence: Nondefense R&D Investment in Fiscal Years 2020 – 2021

In February 2019, President Trump signed Executive Order 13859 “Maintaining American Leadership in Artificial Intelligence,”¹ which launched the American AI Initiative, the U.S. national strategy for leadership in artificial intelligence. The American AI Initiative consists of five main pillars: investing in R&D, setting AI governance standards, unleashing Federal data resources, promoting workforce development, and engaging with international allies².

As directed by Executive Order 13859, NITRD’s *Supplement to the President’s FY2020 Budget*³ included the first ever crosscut of AI R&D spending reported across Federal agencies and departments. Per this report, the FY2020 budget request of \$973.5 million serves as the baseline for reported Federal nondefense AI R&D spending in the United States.

In August 2020, NITRD released the Supplement to the President’s FY2021 Budget,⁴ which identified the FY2020 enacted estimate as over \$1.1 billion and the FY2021 budget request as over \$1.5 billion, summarized in Chart 1 below. NITRD has also released a dashboard of AI R&D investments.



Source: NITRD Supplement to the President’s FY2021 Budget

The FY2021 budget represents a 34.4 percent increase over the FY2020 enacted investments and a 54.3 percent increase over the FY2020 budget request. These investments are primarily made through the National Science Foundation, the Department of Energy, the Department of Commerce’s National

¹ <https://www.whitehouse.gov/presidential-actions/executive-order-maintaining-american-leadership-artificial-intelligence/>

² <https://www.whitehouse.gov/articles/accelerating-americas-leadership-in-artificial-intelligence/>

³ <https://www.whitehouse.gov/wp-content/uploads/2019/09/FY2020-NITRD-AI-RD-Budget-September-2019.pdf>

⁴ <https://www.whitehouse.gov/wp-content/uploads/2017/12/FY2021-NITRD-Supplement.pdf>

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Institute for Standards and Technology, the Department of Agriculture, and the National Institutes of Health.

Highlights from the FY2021 budget request include:

- The increase brings spending for AI R&D and interdisciplinary research institutes at the National Science Foundation to more than \$830 million, which represents a more than 70 percent increase over the FY2020 budget request.
- The Department of Agriculture is investing \$112 million in AI research, up from only \$4 million in the FY2020 budget request.
- The National Institute for Standards and Technology have more than doubled their AI R&D investments, up to \$53 million.

The landscape for AI research and development continues to expand due to significant investments being made by industry, academia, and nonprofit organizations, in addition to the Federal government’s contributions. The United States is far and away the world leader in private sector spending in AI, with nearly \$40 billion invested in 2019⁵.

Recognizing the importance of harnessing the Nation’s vibrant innovation ecosystem, OSTP updated the National AI R&D Strategic Plan in June 2019⁶ to reflect eight R&D priority areas.

Through strong Federal investments and engaging the entire innovation ecosystem, the United States will continue to lead the world in cutting-edge AI advances that will grow our economy, increase our national security, and improve quality of life for the American people.

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⁵ https://hai.stanford.edu/sites/default/files/ai_index_2019_report.pdf

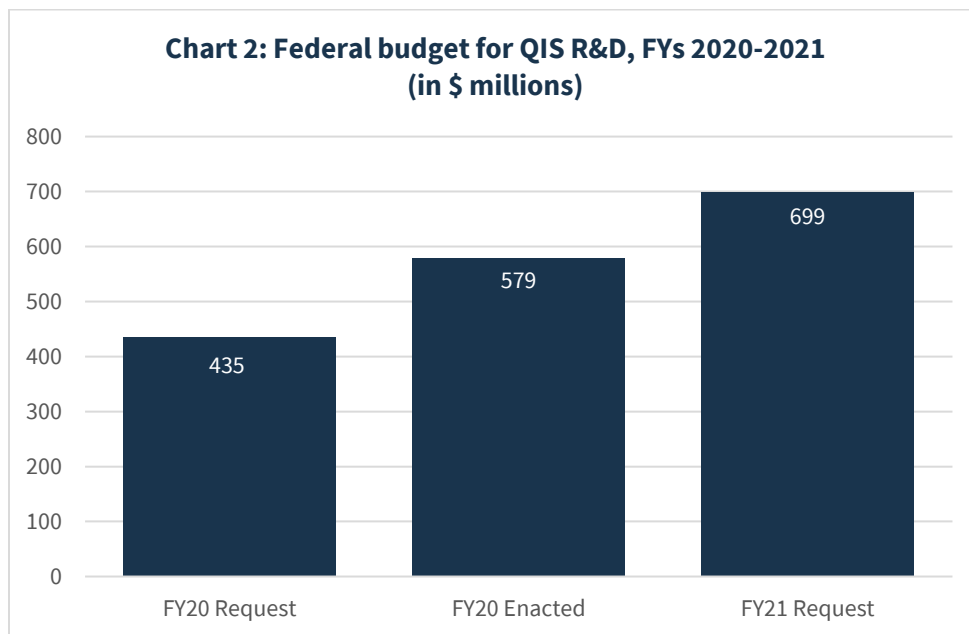
⁶ <https://www.whitehouse.gov/wp-content/uploads/2019/06/National-AI-Research-and-Development-Strategic-Plan-2019-Update-June-2019.pdf>

Quantum Information Science: R&D Investment in Fiscal Years 2020- 2021

In December 2018, President Trump signed the bipartisan National Quantum Initiative Act⁷ to strengthen American leadership in QIS and accelerate R&D in this cutting edge field. The legislation authorized \$1.2 billion in Federal R&D spending over five years, established the National Quantum Coordination Office, and called for the creation of new QIS research institutes and consortia around the country.

Since then, including the President’s call to double QIS R&D by FY2022, the Federal government is on track to surpass the original spending authorization provided by the legislation.

The figures included in Chart 2 identify QIS R&D investment from the FY2020 budget proposal at \$435 million,⁸ the FY2020 enacted estimate at \$579 million, and the FY2021 budget proposal at \$699 million.



Source: OMB and National Quantum Coordination Office

The President’s FY2021 budget request for QIS R&D represents an increase of approximately 60 percent relative to the FY2020 budget request. These investments are primarily made through the National Science Foundation, Department of Energy, and the Department of Commerce’s National Institute for Standards and Technology.

Highlights from the FY2021 budget proposal include:

- National Science Foundation investment in QIS research will double to \$226 million, an additional \$120 million over FY2020.

⁷ <https://www.congress.gov/115/plaws/publ368/PLAW-115publ368.pdf>

⁸ The FY 2020 QIS Budget Request is comprised of funding from DoD, DOE, NIST, NSF, and NASA.

- The Department of Energy Office of Science spending on QIS research will increase to \$237 million, which will boost QIS efforts at the national laboratories and in academia and industry. This represents a nearly \$58 million increase over FY2020 Budget. Within the FY 2021 president's budget is \$25 million for the Department of Energy Office of Science to support early stage research for a quantum internet.

In September 2018, OSTP and the National Science and Technology Council Subcommittee on QIS released the National Strategic Overview for Quantum Information Science,⁹ describing the Administration's top priorities for advancing American leadership in QIS. The approach includes a focus on advancing fundamental science, developing the workforce, expanding partnerships with industry, and engaging with international partners. OSTP and the National Quantum Coordination Office also issued a Strategic Vision for America's Quantum Networks¹⁰, which provides the QIS research community with specific recommendations to focus quantum internet R&D activities.

A significant and sustained effort on fundamental QIS R&D will position American universities, industries, and government researchers to explore basic quantum frontiers, foster revolutionary advances in technology based on QIS, and develop a quantum-ready workforce.

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⁹ <https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Strategic-Overview-for-Quantum-Information-Science.pdf>

¹⁰ <https://www.whitehouse.gov/briefings-statements/president-trumps-fy-2021-budget-commits-double-investments-key-industries-future/>