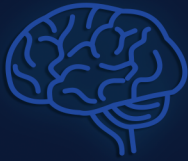


Data Brief



# Spurring Science

Examining U.S. Government  
Grant Activity in AI

---

## Authors

Christian Schoeberl  
Hanna Dohmen



**CSET** CENTER *for* SECURITY *and*  
EMERGING TECHNOLOGY

November 2023

## Executive Summary

Competitive grants—grants centered around a specific research project and distinct from block grants—are one of the U.S. government’s key policy levers to drive technological innovation, spur exploratory scientific research, and advance U.S. technological leadership. This data brief analyzes trends in how U.S. government agencies are using grants to foster AI research and assesses how the U.S. government’s approach to funding AI research differs from other areas of research. With U.S. policymakers increasingly focused on AI innovation, this data brief aims to provide relevant stakeholders with an informational resource about U.S. government grants in AI to inform ongoing debates and policy decisions.

Our analysis uses data sourced from Dimensions, an inter-linked research information system provided by Digital Science, and Crunchbase to analyze U.S. government grants awarded to both industry and academic recipients between 2017 and May 2023.<sup>1</sup> We examined U.S. government grant making, generally, and trends in AI grants. Our findings are as follows:

### *U.S. Government Grant Trends*

- The majority of U.S. government grants were awarded to academia. Between 2017 and May 2023, U.S. government agencies awarded roughly 76 percent of all grants to academic recipients, while industry recipients received only about 9 percent.
- Departments and agencies within the U.S. Department of Defense (DOD) awarded more grants to industry than other U.S. government agencies. Seven of the top 10 agencies awarding the highest percentage of the agency’s grants to industry are part of the DOD.
- Across all fields of research of U.S. government grants, the most common field of research awarded to industry recipients was AI. Twenty-three percent of U.S. government grants awarded to industry were for AI research.

### *AI Grant Trends*

- The number of AI grants awarded per year remained relatively steady over the last five years and consistently accounted for roughly 9 percent of all U.S. government grants.

- The Departments of the Navy, Air Force, and Army appeared to prioritize the funding of AI research through grants relative to other funding agencies. Roughly one fourth of each of the three departments' grants were for AI research.
- AI grants were often awarded to recipients who had already received a grant in the past. Repeat recipients accounted for 61 percent of AI grant recipients between 2017 and May 2023, while 39 percent of recipients were one-time recipients.
- Industry played an outsized role in conducting AI research funded by the U.S. government compared to the role industry played across all fields of research. Industry recipients received 23 percent of all AI grants, which was roughly four times the percentage of grants industry received across all other fields of research combined.

## Introduction

Grants are a transfer of payment from the U.S. government to universities, companies, nonprofit organizations, and other entities to fund innovative research ideas.\* Grants are an important part of the U.S. innovation ecosystem and have the potential to drive technological innovation by funding exploratory research in key emerging technology areas. In general, grants differ from other U.S. government funding tools like subsidies, loans, and procurement because they fund nascent and exploratory research that is not guaranteed to deliver a successful outcome.<sup>2</sup> As a result, some argue that grants are the most suitable U.S. government funding mechanism for foundational research where there can be high social value in a potential scientific finding. Researchers and private sector investors may otherwise be reluctant to take on such projects due to financial constraints and risk without funding from government agencies.<sup>3</sup>

Currently, one of the most important areas of innovation is artificial intelligence (AI), and policymakers are increasingly focused on promoting U.S. competitiveness in AI. For example, the CHIPS and Science Act tasked the National Science Foundation (NSF) with “developing a roadmap to guide investment decisions . . . to advance U.S. competitiveness and develop the U.S. workforce” in critical technology areas such as AI.<sup>4</sup> The CHIPS Act alone allocates \$200 billion for research into AI, quantum computing, and robotics, among other areas.<sup>5</sup> That said, industry plays an outsized role in AI innovation, with major tech hubs like Silicon Valley providing advancements through talent, research, and development. Moreover, key industry players have taken the lead on AI regulation through voluntary commitments and proposing policy development.<sup>6</sup>

To illustrate how the U.S. government employs grants to drive innovation in AI, and in particular, how the U.S. government engages industry and academic recipients, this brief analyzes U.S. government grants awarded to both industry and academia between 2017 and May 2023. This analysis is intended to be an informational resource for policymakers, analysts, and researchers about the U.S. government AI grant landscape and a springboard for future research into more specific U.S. government grant-making policies.

---

\* In this brief, we are only analyzing and discussing competitive grants (referred to as “grants”). Competitive grants are distinct from block grants, which provide large sums of funding for prolonged, broad research. This brief focuses only on grants attached to specific research projects.

## Methodology

This brief draws upon a database of 235,692 competitive grants from 45 unique U.S. government agencies or departments (referred to as ‘agencies’ in this brief) to analyze the primary U.S. government funding sources, the difference between grants going to industry and academia, and trends in AI grants. Recipient analysis is conducted based on the institutional or corporate affiliation of the principal investigators (PIs) awarded the grant. The reporting of grant data varies significantly by agency, which is a key limitation of analyzing U.S. government grant data regardless of collection technique. However, the available data nonetheless provides insight into the grant funding priorities of federal agencies.

The dataset we used for this project is sourced from Dimensions, an inter-linked research information system provided by Digital Science.<sup>7</sup> Digital Science collects grant data from various public sites and provides entity extraction and field classification. We restrict analysis to grants with a start date after December 31, 2016 to focus on current government activity. We analyze how grant recipients vary across agencies and by field of research using data fields provided by Dimensions. By using the Global Research Identifier Database (GRID) key assigned to grant funding agencies, we link recipients to additional metadata related to their location and type, which we use to restrict the set to U.S. federal agencies. Additionally, Dimensions provides a recipient type—including Industry (“Company”) and Academia (“Education”). Lastly, the field of research is generated from Dimensions’ proprietary classification tool.<sup>8</sup> This brief focuses primarily on the “Artificial Intelligence and Image Processing” field (referred to as ‘AI’ in this brief). While Dimensions’ field generation has its limitations, a manual review of these enhancements shows they are reliable for the level of analysis conducted within this publication (for more information, see Appendix 3).

Our research tracks which agencies have funded the most AI research grants from January 2017 to May 2023. Given the differences in reporting requirements, funders in our dataset are identified at varying agency levels, and we relied on expert insight to map agencies to their appropriate analytical level. For example, all national research centers associated with the National Institutes of Health (NIH)—such as the National Institute on Aging—are re-coded to NIH, as the similarity in grant-making processes across research institutes enables aggregation for grant analysis. However, because the departments and agencies related to the United States Department of Defense (DOD) are viewed as distinct entities with unique grant-making processes, we do not aggregate these distinct departments into one entity. Therefore, this brief analyzes grants awarded by departments within the DOD (i.e., the United States Departments

of the Army, Navy, and Air Force) separately from the DOD.<sup>9</sup> Additionally, any state-level agencies are removed from our dataset.

Lastly, as part of our analysis of industry recipients of AI grants, we searched Crunchbase for each company that appears in the Dimensions grant data, using their names and state locations, in order to identify the number of employees per recipient. Through this method, we matched 61 percent of industry grant recipients. While we can characterize a majority of AI industry recipients, the coverage introduces a bias towards larger companies that are likely to be included in a corporate data aggregator like Crunchbase and is not representative of industry recipients as a whole.

## Findings

In this section, we first analyze general trends in U.S. government grants, including funding institutions, recipients, and fields of research. Following a general overview of U.S. government grants, we focus our analysis on trends in U.S. government AI grants. While the majority of federal grants are generally awarded to academic recipients, we find that industry played an outsized role in U.S. government grant funding of AI research, particularly for agencies that are part of the DOD. AI was the most common field of research for grants awarded to industry recipients between 2017 and May 2023. Moreover, almost a quarter of all U.S. government grants awarded in AI went to industry. This may be attributed to the fact that the private sector plays a particularly vital role in AI innovation relative to other fields where the U.S. government awards grants, but further research would be required to confirm this interpretation.

### ***U.S. Government Grant Trends***

We begin our analysis by looking at the 235,692 grants awarded by the U.S. government between 2017 and May 2023. The NIH and the NSF collectively accounted for about two-thirds of all U.S. government grants in this period, awarding about 89,000 and 67,000 grants, respectively. This is not surprising considering the mission of the NIH is to improve the health of the United States by conducting and supporting research.<sup>10</sup> Similarly, the NSF aims to support science and engineering across the United States primarily through making grants.<sup>11</sup>

**Figure 1. Top Federal Agencies by Total Grants Awarded, 2017-2023**

Funding Agency	Total Agency Grants	Percentage of Total U.S. Grants	Total Agency Grant Funding (USD, Millions)	Percentage of Total U.S. Grant Funding
National Institutes of Health	88,894	38%	\$139,824	53%
National Science Foundation	67,191	29%	\$48,794	19%
National Institute of Food and Agriculture	15,483	7%	\$5,544	2%
U.S. Department of the Navy	8,505	4%	\$8,200	3%
U.S. Department of Energy	6,895	3%	\$13,698	5%
U.S. Department of the Air Force	6,020	3%	\$4,707	2%
Congressionally Directed Medical Research Programs	5,268	2%	\$6,996	3%
Agricultural Research Service	5,233	2%	\$12	0%
National Endowment for the Humanities	4,124	2%	\$854	0%
U.S. Department of the Army	3,902	2%	\$2,569	1%

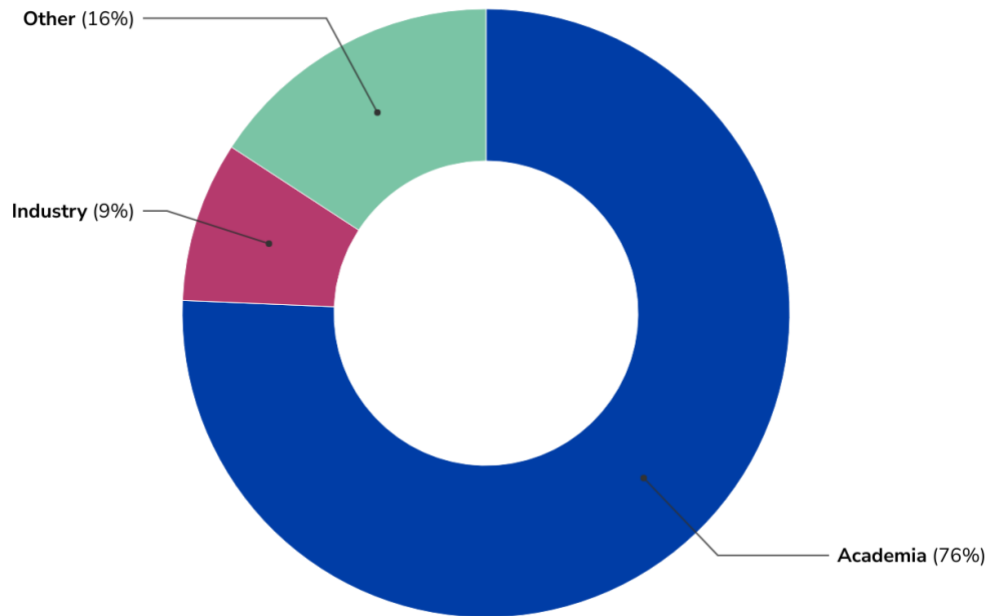
Source: Dimensions.

Other agencies awarded far fewer grants and received far less funding compared to the NIH and NSF, as shown in Figure 1. The NIH and NSF collectively accounted for 67 percent of all U.S. government grants and 72 percent of all U.S. government grant funding. The United States Department of Agriculture’s National Institute of Food and Agriculture (NIFA)—the third-highest funding agency by number of grants—awarded just over 15,000 grants, and all remaining funding agencies awarded less than 10,000 grants in this period. Of the top 10 funding agencies, three are part of the DOD.<sup>12</sup>

Looking at the types of institutions that received grants from the U.S. government over the past five years, Figure 2 shows that U.S. government agencies awarded roughly 76 percent of grants to academic recipients and only 9 percent to industry. “Other” recipients include nonprofits, healthcare, government, and additional facilities. This supports the conventional wisdom that the U.S. government awards a higher percentage of grants to academia than to industry.<sup>13</sup>



**Figure 2. Share of Grants Awarded to Industry vs. Academia, 2017-2023**



Source: Dimensions.

While the U.S. government provided more grants to academia than to industry, there is a notable difference in the distribution of grants by recipient types between the various agencies. As shown in Figure 3, the United States Department of Homeland Security (DHS), the Defense Logistics Agency (DLA), the Missile Defense Agency (MDA), and the National Institute of Standards and Technology (NIST) were the top funders of grants to industry, awarding more than 90 percent of their respective grants to industry recipients. Furthermore, seven of the top 10 funding agencies awarding grants to industry were part of the DOD, as noted with an asterisk in Figure 3.<sup>14</sup> Conversely, just one of the top 10 by percentage of agency grants to academia were part of the DOD—the National Security Agency (NSA). This suggests that defense-related agencies were more likely to give grants to industry recipients than other funding agencies over the last five years.

**Figure 3. Top 10 Agencies by Share of Grants Awarded to Academia and Industry Recipients**

Academia	Industry
U.S. Department of Agriculture	U.S. Department of Homeland Security
Health Resources and Services Administration	Defense Logistics Agency*
National Institute of Food and Agriculture	Missile Defense Agency*
National Science Foundation	National Institute of Standards and Technology
Environmental Protection Agency	National Geospatial-Intelligence Agency*
National Security Agency*	U.S. Department of Defense (misc.)* <sup>†</sup>
U.S. Geological Survey	National Aeronautics and Space Administration
U.S. Department of Transportation	Defense Advanced Research Projects Agency*
National Institute on Minority Health and Health Disparities	U.S. Department of the Army*
U.S. Department of Education	U.S. Department of the Air Force*

Source: Dimensions.

<sup>†</sup>United States Department of Defense (misc.) is an artifact of the underlying dataset. For more information, see Appendix 1.

Funding agencies within the United States Department of Defense are noted with an asterisk.

AI was by far the most common field of research for industry recipients between 2017 and May 2023. Figure 4 shows that AI grants made up 23 percent—almost a quarter—of all federal grants awarded to industry recipients. This finding could be explained by the fact that the private sector plays a disproportionate role in AI innovation, but further research would be required to confirm this interpretation. The second most common field of research for industry recipients was materials engineering, garnering 17 percent of total industry grants. In terms of funding amounts, the AI grants awarded to industry recipients accounted for about \$4.39 billion, or 11 percent, of all industry grant funding, behind only materials engineering at 13 percent.<sup>15</sup>

Figure 4. Top 10 Fields of Research by Number of Industry Grants, 2017-2023

Field of Research	Total Grants to Industry	Percentage of Total Industry Grants
Artificial Intelligence and Image Processing	4,547	23%
Materials Engineering	3,221	16%
Other Physical Sciences	1,688	8%
Information Systems	1,677	8%
Electrical and Electronic Engineering	1,341	7%
Communications Technologies	948	5%
Physical Chemistry (incl. Structural)	946	5%
Public Health and Health Services	915	5%
Interdisciplinary Engineering	807	4%
Clinical Sciences	789	4%

Source: Dimensions.

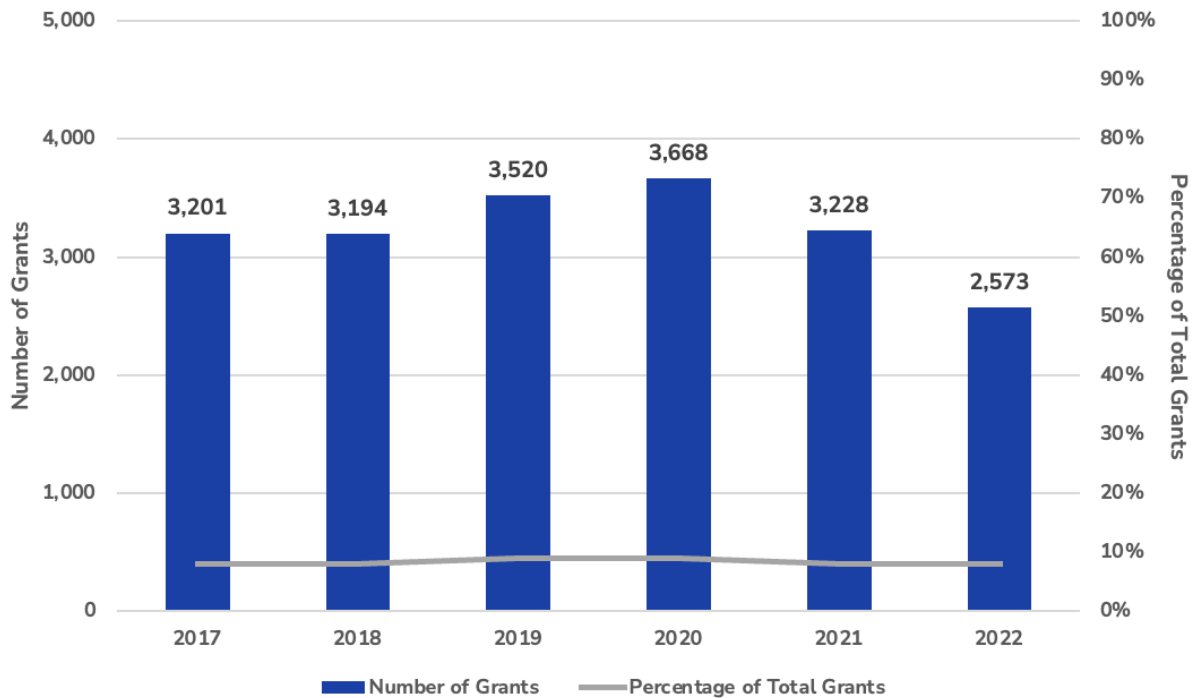
Federal agencies allow for grants to be awarded to multiple principal investigators (PIs), including to both industry and academic recipients. Such grants represented less than 1 percent of all grants within our dataset. While collaboration between industry and academic recipients was rare, it nonetheless happened most frequently in AI.

### **AI Grant Trends**

Between 2017 and May 2023, the U.S. government awarded a total of 19,459 AI grants. Here, we further analyze this set of AI grants to better understand U.S. government grant funding trends in AI.

While discussions of AI developments have increased in recent years, the data do not show an increase in the number of AI grants awarded per year since 2017, nor in the share of total U.S. grant funding awarded to AI grants. As Figure 5 shows, U.S. government agencies awarded 3,200 AI grants on average per year, which was consistently around 8 to 9 percent of the total number of grants awarded. Furthermore, AI grants have consistently accounted for around 8 percent of total grant funding from 2017 through 2022, the last full year of data available.

Figure 5. AI Grants by Start Year, 2017-2022



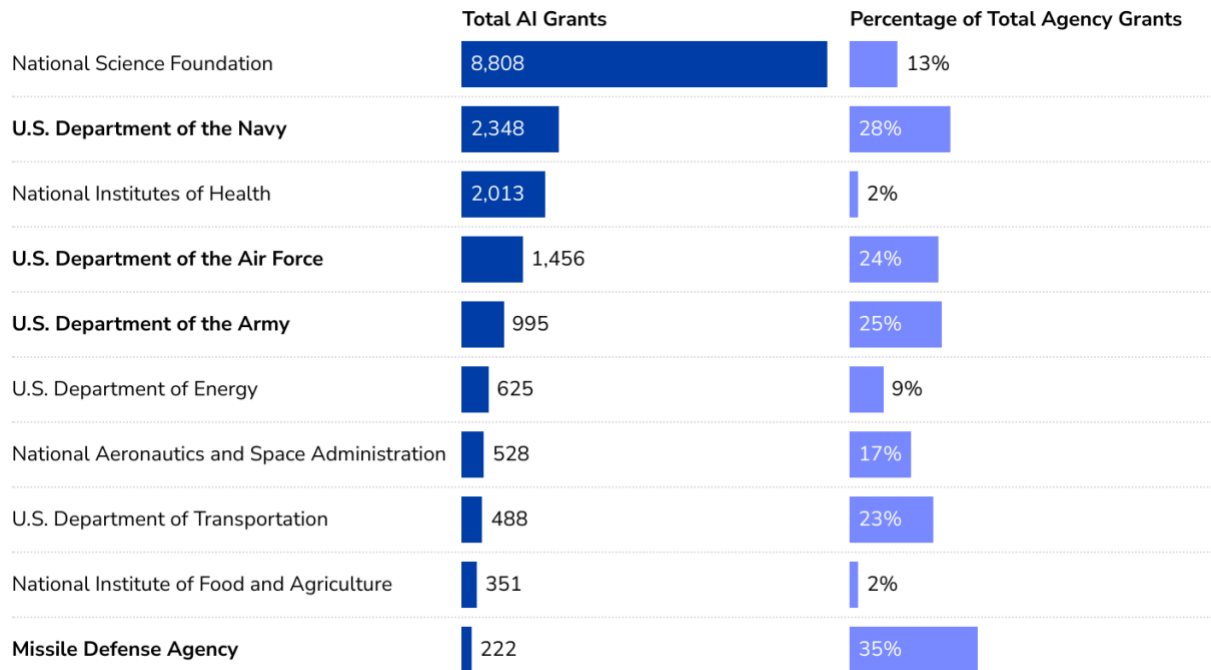
Source: Dimensions.

Our analysis also shows that agencies were more likely to award AI grants to recipients who previously received AI grants than to award AI grants to new recipients. We find that repeat AI grant recipients account for the majority (61 percent) of all AI grant recipients. For comparison, repeat recipients accounted for 70 percent of all U.S. government grants. We believe this to be the case, in part, because grants build relationships between the applicants and the funding agency, as recipients can demonstrate their competency in a given research field to federal agencies and establish long-term working relationships.<sup>16</sup>

The top three funding agencies for AI grants between 2017 and May 2023 were the NSF (8,800), the Navy (2,300), and the NIH (2,000). Given that both the NSF and NIH award significantly more grants than other U.S. government agencies across all fields of research, it is important to look at these numbers in context. When analyzing the percentage of AI grants awarded by an agency relative to the agency's total grants awarded across all fields of research, we find that AI grants accounted for 13 percent of all grants from the NSF, 28 percent of all grants from the Navy, and 2 percent of all grants from the NIH.

As shown in Figure 6, in addition to the Navy, the Air Force and the Army also awarded roughly a quarter of their respective grant portfolios to AI research. Moreover, the MDA, the National Geospatial-Intelligence Agency (NGA), and the Defense Advanced Research Projects Agency (DARPA) all awarded more than 30 percent of their grants to AI projects, as shown in Appendix 4.<sup>17</sup> These findings suggest that DOD-related agencies may award a higher percentage of grants to AI research than other agencies.

**Figure 6. Top Agencies Funding AI Grants, 2017-2023**



Source: Dimensions.

As Figure 7 shows, the top agencies that awarded AI grants to academia differed considerably from the top agencies which awarded AI grants to industry between 2017 and 2023. For example, the United States Department of Agriculture (USDA) and the United States Environmental Protection Agency (EPA) both awarded 100 percent of their AI grants to academia during this time period. Yet there were no DOD-linked agencies on the list of the top 10 federal agencies that awarded a notable share of their AI grants to academia. Seven of the top 10 agencies that awarded a high share of their AI grants to industry, however, were linked to the DOD. This suggests that DOD-related agencies tended to award a much higher percentage of their AI grants to industry as opposed to academia.

**Figure 7. Top 10 Agencies by Share of AI Grants to Academia and Share of AI Grants to Industry**

Academia	Industry
Environmental Protection Agency	U.S. Department of Homeland Security
U.S. Department of Agriculture	Missile Defense Agency*
National Science Foundation	U.S. Department of Defense (misc.)* <sup>†</sup>
National Institute of Food and Agriculture	Defense Logistics Agency*
National Endowment for the Humanities	National Institute of Standards and Technology
U.S. Department of Transportation	National Geospatial-Intelligence Agency*
National Institute of Justice	National Aeronautics and Space Administration
Advanced Research Projects Agency-Energy	Defense Threat Reduction Agency*
Agency for Healthcare Research and Quality	Defense Advanced Research Projects Agency*
Congressionally Directed Medical Research Programs	U.S. Department of the Army*

Source: Dimensions.

<sup>†</sup>United States Department of Defense (misc.) is an artifact of the underlying dataset. For more information, see Appendix 1.

Funding agencies within the United States Department of Defense are noted with an asterisk.

However, not all grants to industry represent the same amount of grant funding. Figure 8 shows the top 10 agencies ranked by the difference in their share of AI grants and AI grant funding amounts. Notably, among the top 10 agencies, DLA, NGA, MDA, the DOD (misc.), Army, the Defense Threat Reduction Agency (DTRA) and DARPA (all agencies within the DOD) awarded a lower share of AI grant funding relative to the share of total agency AI grants awarded to industry. This suggests that while certain agencies were more likely to engage with industry for research projects, the awarded grants were financially smaller than grants going to other recipient types. This trend was especially noticeable among agencies within the DOD.

**Figure 8. Top 10 Agencies by Largest Difference Between Industry AI Grant Share and Industry AI Grant Funding Share**

Funding Agency	Industry Grants	Percentage of Total Agency Grants	Percentage of Total Agency Grant Funding
Office of the Secretary of Defense	82	47%	6%
U.S. Food and Drug Administration	7	39%	10%
Defense Threat Reduction Agency	57	79%	51%
National Institute on Disability, Independent Living, and Rehabilitation Research	7	30%	4%
Missile Defense Agency	214	96%	72%
U.S. Department of Defense (misc.)	140	93%	70%
U.S. Department of the Air Force	852	59%	37%
U.S. Department of Education	6	26%	5%
Defense Advanced Research Projects Agency	133	70%	49%
Centers for Disease Control and Prevention	7	30%	10%

Source: Dimensions.

Further analysis of AI grants finds that industry received an outsized share of federal AI grants relative to all other fields combined.<sup>18</sup> Table 1 shows that U.S. government agencies awarded 23 percent of all AI grants to industry recipients between 2017 and 2023, which is almost four times greater than the percentage of grants awarded to industry for all other fields combined (6 percent). Meanwhile, the share of grants awarded to academic recipients across these sets is roughly the same. While determining cause falls beyond the scope of this data brief, one possible interpretation is that the U.S. government seeks AI research from industry because the private sector leads in AI research and development.

**Table 1. Share of AI Grants to Industry Greater than All Other Fields Combined**

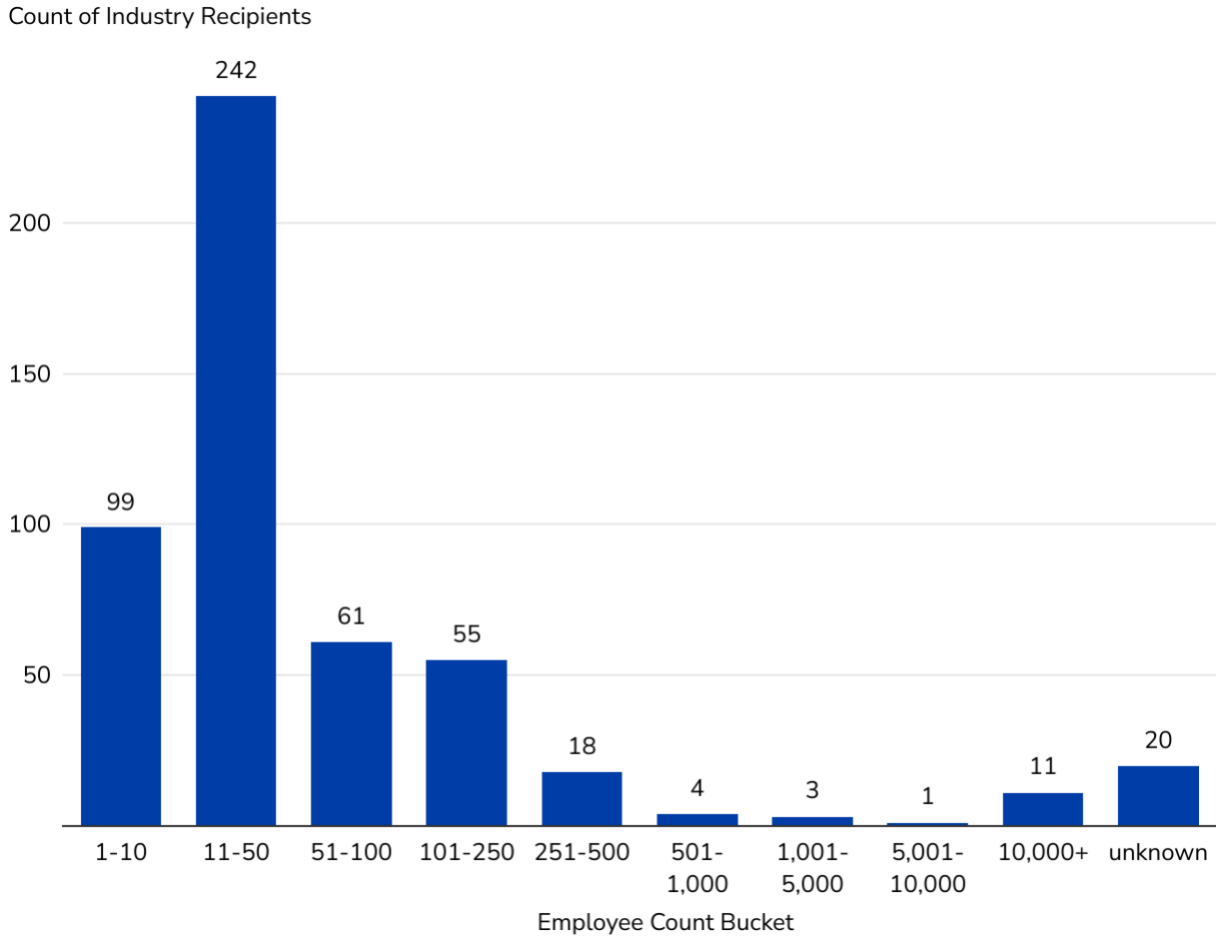
<b>Field of Research</b>	<b>Industry Grants</b>	<b>Academia Grants</b>	<b>Total Grants</b>
<b>Artificial Intelligence and Image Processing</b>	4,547 (23%)	14,526 (75%)	19,459
<b>All Other Fields of Research</b>	21,575 (6%)	276,031 (79%)	350,661

Source: Dimensions.

As previously noted, we were able to get company data provided by Crunchbase on about 61 percent of the companies that received AI grants from the U.S. government over the last five years. Using this data, we find that 78 percent of these companies have 100 or fewer employees. Figure 9 shows that almost half of these industry recipients were companies with 11-50 employees, 20 percent had 1-10 employees, and 12 percent had 51-100 employees. Given that Crunchbase has lower coverage of smaller companies relative to larger ones, this trend is not an artifact of incorporating financial information and could be even larger with full industry coverage.



Figure 9. AI Grants Industry Recipients: Distribution of Company Employee Size



Source: Dimensions and Crunchbase.<sup>19</sup>

Based on our data, larger companies received fewer grants from U.S. government agencies than smaller companies. However, the grants received by larger companies had substantially more money attached than the grants received by smaller companies.

## Conclusion

Grants are a foundational part of the U.S. innovation ecosystem and one of the key policy levers the U.S. government has to drive technological innovation. Using grants, the U.S. can spur exploratory research for the greater public good and help advance its technological leadership. With U.S. policymakers increasingly focused on AI innovation, this data brief sought to analyze trends in how U.S. government agencies are using grants to foster research in AI. Through this research, we have shown how the U.S. government's approach to grants in AI appears to differ from broader grant-giving activity over the last five years.

Overall, we find that the number of AI grants awarded per year and the percentage of U.S. government grants supporting AI research remained steady between 2017 and May 2023, while also constituting a consistent share of total grant funding over that time period. As conventional wisdom about U.S. government grants states and as our research confirms, the majority of grants are awarded to academic recipients. However, industry received four times as many grants for AI research than for other fields of research, showing that industry plays an instrumental role in U.S. government-funded AI research. Additionally, almost a quarter of all U.S. government grants awarded to industry in this period were for AI research.

Our analysis also shows that defense-related agencies more often awarded AI grants to industry than other funding agencies. Funding AI research through grants appeared to be a relative priority for the Departments of the Navy, Air Force, and Army, as well as the NGA, MDA, and DARPA as compared to other funding agencies. For the three military branches in particular, AI grants accounted for both a high number of grants and a high percentage of each agency's total agency grants.

While DOD-related agencies appeared to engage with industry for AI research projects more often, the awarded AI grants were often financially smaller than grants going to academia and other recipient types.

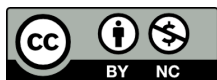
While our analysis highlights key insights into how different parts of the U.S. government use grants to fund AI research, more research is needed to examine what topics within the broad category of AI are being funded by different U.S. government agencies. An expansion of this research would help inform policymakers how funding is being allocated for research in AI.

## Authors

Christian Schoeberl is a data research analyst at CSET, where Hanna Dohmen is a research analyst.

## Acknowledgements

For feedback and assistance, the authors would like to thank Jack Corrigan, Steph Batalis, James Dunham, Emily Weinstein, Jacob Feldgoise, Melissa Flagg, Margarita Konaev, Catherine Aiken, Danielle Li, Kevin Boyack, and Matt Mahoney.



© 2023 by the Center for Security and Emerging Technology. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.

To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc/4.0/>.

Document Identifier: doi: 10.51593/20230019

## Appendix

### Appendix 1: Agency Name Remapping

Within the original dataset, we found 64 unique federal agencies. However, these agencies varied by organizational and department level. Our team tapped internal and external experts to map each granting agency to its appropriate parent organization. The table below shows the full mapping by agency. The Department of Defense is a funding agency within the original dataset, despite not providing competitive grants themselves. Without additional information for the grants, we cannot assign them to a more specific agency. We code the agency as “Department of Defense (misc.)” to reflect this artifact of the data.

Furthermore, we choose not to assign subagencies to their parent organizations (ex. United States Air Force to the Department of Defense). Given these agencies all have separate grant mechanisms and goals, we choose to preserve sub-agency activity.

**Table 2. Mapping of Original Dimensions Funders to Principal Agencies for Analysis**

Original Funder Name	Remapped Funder Name
Administration for Children and Families	Administration for Children and Families
Advanced Research Projects Agency-Energy	Advanced Research Projects Agency-Energy
Agency for Healthcare Research and Quality	Agency for Healthcare Research and Quality
Agricultural Research Service	Agricultural Research Service
American Institute for Cancer Research	American Institute for Cancer Research
California Institute for Regenerative Medicine	<i>Removed from Analysis</i>
Cancer Prevention and Research Institute of Texas	<i>Removed from Analysis</i>
Center for Disease Control	Centers for Disease Control and Prevention
Centers for Disease Control and Prevention	Centers for Disease Control and Prevention
Congressionally Directed Medical Research Programs	Congressionally Directed Medical Research Programs
Defense Advanced Research Projects Agency	Defense Advanced Research Projects Agency
Defense Logistics Agency	Defense Logistics Agency
Defense Threat Reduction Agency	Defense Threat Reduction Agency
Directorate for Biological Sciences	National Science Foundation
Directorate for Computer & Information Science & Engineering	National Science Foundation
Directorate for Engineering	National Science Foundation
Directorate for Geosciences	National Science Foundation

Directorate for Mathematical & Physical Sciences	National Science Foundation
Directorate for STEM Education	National Science Foundation
Directorate for Social, Behavioral & Economic Sciences	National Science Foundation
Environmental Protection Agency	Environmental Protection Agency
Gulf of Mexico Research Initiative	<i>Removed from Analysis</i>
Health Resources and Services Administration	Health Resources and Services Administration
Institute of Museum and Library Services	Institute of Museum and Library Services
Missile Defense Agency	Missile Defense Agency
National Aeronautics and Space Administration	National Aeronautics and Space Administration
National Cancer Institute	National Institutes of Health
National Center for Advancing Translational Sciences	National Institutes of Health
National Endowment for the Humanities	National Endowment for the Humanities
National Geospatial-Intelligence Agency	National Geospatial-Intelligence Agency
National Institute of Food and Agriculture	National Institute of Food and Agriculture
National Institute of Health	National Institutes of Health
National Institute of Justice	National Institute of Justice
National Institute of Standards and Technology	National Institute of Standards and Technology
National Institute on Disability, Independent Living, and Rehabilitation Research	National Institute on Disability, Independent Living, and Rehabilitation Research
National Institute on Minority Health and Health Disparities	National Institute on Minority Health and Health Disparities
National Oceanic and Atmospheric Administration	National Oceanic and Atmospheric Administration
National Security Agency	National Security Agency
New York State Energy Research and Development Authority	<i>Removed from Analysis</i>
Office of Advanced Scientific Computing Research	U.S. Department of Energy
Office of Basic Energy Sciences	U.S. Department of Energy
Office of Biological and Environmental Research	U.S. Department of Energy
Office of Fossil Energy	U.S. Department of Energy
Office of Fusion Energy Sciences	U.S. Department of Energy
Office of Nuclear Energy	U.S. Department of Energy
Office of Nuclear Physics	U.S. Department of Energy
Office of Science	U.S. Department of Energy
Office of the Director	<i>Removed from Analysis</i>

Office of the Secretary of Defense	Office of the Secretary of Defense
U.S. Forest Service	US Forest Service
U.S. Air Force	U.S. Department of the Air Force
U.S. Department of Agriculture	U.S. Department of Agriculture
U.S. Department of Defense	U.S. Department of Defense (misc.)
U.S. Department of Education	U.S. Department of Education
U.S. Department of Energy	U.S. Department of Energy
U.S. Department of Homeland Security	U.S. Department of Homeland Security
U.S. Department of Transportation	U.S. Department of Transportation
U.S. Department of Veterans Affairs	U.S. Department of Veterans Affairs
U.S. Department of the Air Force	U.S. Department of the Air Force
U.S. Department of the Army	U.S. Department of the Army
U.S. Department of the Navy	U.S. Department of the Navy
U.S. Food and Drug Administration	U.S. Food and Drug Administration
U.S. Geological Survey	U.S. Geological Survey
U.S. Marine Corps	U.S. Department of the Navy

## Appendix 2: Abbreviations

Within this data brief, we reference various agencies by abbreviation. Below is the full set of agencies to abbreviations used.

DARPA	Defense Advanced Research Projects Agency
DHS	United States Department of Homeland Security
DLA	Defense Logistics Agency
DOD	Department of Defense
DTRA	Defense Threat Reduction Agency
EPA	United States Environmental Protection Agency
FDA	United States Food and Drug Administration
MDA	Missile Defense Agency
NGA	National Geospatial-Intelligence Agency
NIFA	National Institute of Food and Agriculture
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NSA	National Security Agency
NSF	National Science Foundation
USDA	United States Department of Agriculture

### **Appendix 3: Manual Review of Dimensions Grants Data**

Prior to conducting any analysis on our dataset of grants, our team reviewed a random sample (n=200) of the Dimensions data. By reviewing each grant's title and description, we were able to gauge the accuracy of the funding agency, grant recipient, funding amount, and fields of research. Each field largely tracks with the grant metadata. However, Dimensions conducts entity resolution for both granting agency and grant recipient which is not always accurate. Such entity resolution is never fully accurate. Dimensions does not offer specific performance for their grants entity resolution; however, our dataset showed minimal false attributions for grant recipients. These false attributions tended to occur for recipients with abbreviations or minimally-identifying names—which rarely occurs for the total set of recipients.

Source: Dimensions.



## Appendix 4: DOD Agencies Award Relatively High Share of Agency’s Grants to AI Research

As shown in our data brief, our research suggests that funding AI research via grants has been a priority for the military service branches relative to other agencies over the last five years. Figure 10 shows the agencies funding AI the most by percent share of total agency grants. Among the top 10 agencies, seven are part of the DOD. The NGA, MDA, and DARPA all awarded more than 30 percent of their grants to AI projects. Additionally, the Navy, Air Force, and Army each awarded roughly a quarter of their respective grant portfolios to AI grants. Notably, these three departments also had larger grant pools overall compared to other agencies in the top 10.

**Figure 10. Agencies Funding AI Grants by Highest Percent of Total Agency Grants**

Funding Agency	AI Grants	Percentage of Total Agency Grants
National Geospatial-Intelligence Agency	112	81%
U.S. Department of Homeland Security	66	55%
Missile Defense Agency	222	35%
Defense Advanced Research Projects Agency	190	31%
U.S. Department of the Navy	2,348	28%
U.S. Department of the Army	995	26%
U.S. Department of the Air Force	1,456	24%
National Institute of Standards and Technology	8	23%
U.S. Department of Transportation	488	23%
Defense Threat Reduction Agency	72	21%

Source: Dimensions.

## Appendix 5: Military Branches Award to High Number of Fields of Research, Yet AI Research Share Remains High

Not only do the military service branches have a relatively large pool of grants, they also award grants to a relatively high number of unique fields of research. To find how agencies distribute their grants across fields of research, we analyzed the difference between the percentage of agency grants awarded for AI relative to the average percentage awarded for all other fields of research.<sup>20</sup> The Departments of the Navy, Air Force, and Army awarded roughly 25 percent of grants for AI research, while they awarded only 1 to 2 percent of grants to other fields of research.

**Figure 11. Top Agencies by Number of Fields of Research**

Funding Agency	Unique Fields of Study	Average Grant Share per Field	AI Percentage Share
National Science Foundation	123	1%	13%
National Institute of Food and Agriculture	103	2%	2%
National Institutes of Health	94	2%	2%
U.S. Department of the Navy	87	1%	28%
U.S. Department of the Air Force	84	1%	24%
National Aeronautics and Space Administration	84	1%	17%
U.S. Department of the Army	84	2%	26%
Agricultural Research Service	83	2%	3%
Office of the Secretary of Defense	75	2%	17%
National Oceanic and Atmospheric Administration	74	1%	4%

Source: Dimensions.

## Endnotes

<sup>1</sup> <http://www.dimensions.ai>, pulled on May 19th, 2023.

<sup>2</sup> Pierre Azoulay and Danielle Li, “Scientific Grant Funding,” MIT & NBER, November 27, 2020.

<sup>3</sup> Pierre Azoulay and Danielle Li, “Scientific Grant Funding,” MIT & NBER, November 27, 2020; See the Research Funding Ecosystem 2x2 matrix.

<sup>4</sup> “NSF seeks input to develop an investment roadmap for its new Directorate for Technology, Innovation and Partnerships,” National Science Foundation, May 1, 2023, <https://new.nsf.gov/tip/updates/nsf-seeks-input-develop-investment-roadmap>.

<sup>5</sup> “What the CHIPS and Science Act Means for Artificial Intelligence,” <https://hai.stanford.edu/sites/default/files/2022-08/HAI%20Explainer%20-%20What%20The%20CHIPS%20and%20Science%20Act%20Means%20for%20AI.pdf>.

<sup>6</sup> “Fact Sheet: Biden-Harris Administration Secures Voluntary Commitments from Leading Artificial Intelligence Companies to Manage the Risks Posed by AI,” <https://www.whitehouse.gov/briefing-room/statements-releases/2023/07/21/fact-sheet-biden-harris-administration-secures-voluntary-commitments-from-leading-artificial-intelligence-companies-to-manage-the-risks-posed-by-ai/>.

<sup>7</sup> <http://www.dimensions.ai>, pulled on May 19th, 2023.

<sup>8</sup> See appendix for additional manual review of the fields of research generated by Dimensions.

<sup>9</sup> See appendix for full set of re-coded funding agencies.

<sup>10</sup> Mission and Goals, National Institutes of Health, U.S. Department of Health and Human Services, July 27, 2017, <https://www.nih.gov/about-nih/what-we-do/mission-goals>. Additionally, most of NIH’s funding is “awarded for extramural research, largely through almost 50,000 competitive grants to more than 300,000 researchers at more than 2,500 universities, medical schools, and other research institutions in every state.” Budget, National Institutes of Health, U.S. Department of Health and Human Services, August 18, 2022, <https://www.nih.gov/about-nih/what-we-do/budget>.

<sup>11</sup> About NSF, National Science Foundation, <https://new.nsf.gov/about>.

<sup>12</sup> We determine which funding agencies are under the United States Department of Defense based on this DOD organizational structure: “DOD Key Leadership Facecharts,” The Acquisition Innovation Center, January 19, 2022, <https://acqirc.org/wp-content/uploads/2022/03/220119-the-DOD-Face-Chart-2022011939.pdf>.

<sup>13</sup> Academic Research and Development, Science & Engineering Indicators, National Science Board, 15 January, 2020, <https://nces.nsf.gov/pubs/nsb20202/academic-r-d-in-the-united-states>.

<sup>14</sup> “DOD Key Leadership Facecharts,” The Acquisition Innovation Center, January 19, 2022, <https://acqirc.org/wp-content/uploads/2022/03/220119-the-DOD-Face-Chart-2022011939.pdf>.

We understand that the DOD is not one funding agency, and the funders within the DOD have distinct funding approaches.

<sup>15</sup> The funding amounts provided by Dimensions are reported in dollar figures at the grant's starting year. To analyze trends in funding across years, we adjust each grant's starting year funding amount to 2023 dollars using the Bureau of Labor Statistics inflation calculator.

<sup>16</sup> Recipients at the institutional—not individual—level.

<sup>17</sup> See Appendix 4 for data showing the top agencies funding AI grants by the highest percentage of total agency grants.

<sup>18</sup> In addition to analyzing the share of AI grants awarded to academia and industry, we also analyzed the share of AI grant funding to test whether the share of AI grants is significantly different than the share of grant funding awarded for AI grants. The share of AI grant funding was only a few percentage points lower than the share of AI grants.

<sup>19</sup> The “unknown” category is an artifact of Crunchbase. Companies which have other corporate information but are missing employee counts receive “unknown,” thus, “unknown” does not refer to companies which were not matched to Crunchbase.

<sup>20</sup> These fields are developed and assigned by Dimensions.