

THE CYBER PROJECT

The Case for Increased Transatlantic Cooperation on Artificial Intelligence

Christie Lawrence

Sean Cordey

EDITED BY:

Lauren Zabierek

Julia Voo



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Belfer Center for Science and International Affairs
Harvard Kennedy School
79 JFK Street
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About the Authors

Christie Lawrence is a concurrent Master of Public Policy and Juris Doctorate 2024 candidate at Harvard Kennedy School and Stanford Law School and recipient of Harvard Kennedy School's John F. Kennedy Fellowship. She previously worked as a management consultant for Oliver Wyman where she focused on regulatory risk and global data protection for financial institutions. She also worked at the Department of State. Her research with the Belfer Cyber Project includes AI policy, cybersecurity, US-Russian cyber relations, and US foreign policy in the digital age.

Sean Cordey is a dual Master degree in International Affairs candidate at the Fletcher School of Law and Diplomacy and the University of St. Gallen and was a Belfer Cyber Security Project research assistant. He previously worked for the Swiss ministry of foreign affairs in Washington D.C. and currently works as a researcher for the Cyber Defense Project at the Center for Security Studies (CSS) at the ETH Zürich. His research and policy interests include national and European AI, cybersecurity and cyberdefense policy, cyber enabled influence operations and technologies of surveillance.

About the Editors

Lauren Zabierek is the Executive Director of the Cyber Project at Harvard Kennedy School's Belfer Center where she leads research and programming on domestic and international cyber and emerging technology policy issues; her driving vision for the Project is "Cybersecurity is National Security." She comes to this role as a 2019 graduate of the Kennedy School's mid-career MPA program. Lauren served as an intelligence officer in the United States Air Force at the beginning of her career. Later, as a civilian intelligence analyst with the National Geospatial Intelligence Agency (NGA) assigned to the Office of Counterterrorism, she completed three war zone deployments where she worked to identify and dismantle terror networks. After leaving NGA, she joined the cybersecurity threat intelligence startup Recorded Future, and was instrumental in building its Public Sector business practice.

Julia Voo is a Cyber Fellow, leads the team behind Belfer's National Cyber Power Index, and is the former Research Director for the Belfer Center's new China Cyber Policy Initiative. Her areas of research include the Digital Silk Road, industrial policy, and technical standards for strategic technologies. Voo also has research affiliations with the Future of Humanity Institute (Oxford), the Hague Program for Cyber Norms (Leiden), and the China-Africa Research Initiative (Johns Hopkins). A 2019 graduate of Harvard Kennedy School's mid-career Master in Public Administration program, Julia served earlier at the British Embassy in Beijing where she covered China's cyber and artificial intelligence policy from a commercial perspective, technical standards, and other trade policy issues. She lived in Beijing for seven years with stints at the EU Delegation to China, Carnegie-Tsinghua Centre for Global Policy, and she has spent time at the UK's Cabinet Office.

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Foreword

The next decade will be a decisive time for the US to shape its future role in the world.

Democracies are being tested and toyed with by malign powers, as seen in the form of Russian interference in the 2016 US Presidential elections and subsequent disinformation campaigns by other nations.

Great power politics and the national security implications of emerging technologies, such as AI, are breaking up supply chains and further fragmenting the internet.

We're witnessing shocks to the liberal economic order and global governance as a result of several economic crises and the aftermath of the biggest public health crisis in a century. Societies across the world will be looking to develop and implement new technology to deal with crises and recover from economic losses faster.

The rise of revisionist powers and the transformative potential of emerging technologies means that the US and its European allies need to prioritize investing in capabilities and its relationships to ensure that emerging technologies align with liberal, democratic values.

While the US currently maintains a slight edge in research and development of AI capabilities, that advantage is eroding as a result of a shortage of AI talent, lack of engagement between the federal government, academia, and the private sector, and overall gaps in federal government funding. US innovation has its roots in an open and multicultural society. American leadership in innovation is the result of decades of attracting, training, and recruiting the brightest minds in the world. While recognizing that there are some national security risks, efforts to cut off the flow of students will be detrimental to long-term US innovative capabilities.

The European Union while maintaining its role as a leader in AI ethical guidelines, also faces challenges stemming from a lack of talent as well as insufficient funding and uncoordinated AI expertise and application across the Member States. Moreover, the EU suffers from other institutional challenges that are most glaringly demonstrated by the UK's vote to leave the EU in 2016—which unbeknownst at the time dealt a major blow to the EU's AI ecosystem.

The US and EU need to enhance cooperation in the development and application of AI in healthcare, environmental science, and defense. When the US and EU work together on global challenges such as healthcare and environment science, the rest of the world benefits. And there are other key geopolitical challenges that the US and EU face that can only be balanced together.

We are delighted to share with you this analysis of the AI landscape between the US and EU, written and researched by our students working with the Cyber Project and China Cyber Policy Initiative, Christie Lawrence and Sean Cordey. We feel this report provides a strong evidence base for further collaboration, and puts forth thoughtful recommendations.

The importance of the transatlantic relationship cannot be understated. The world needs strong leadership in these uncertain times and the US and EU bring unique strengths to the table that collaboratively can strengthen the other's advantage in the face of unprecedented technological and geopolitical challenges. The US and the EU need to work together.

Thank you for your consideration,

Julia Voo and Lauren Zabierek

Acronyms

AI HLEG	AI High Level Expert Group (EU)
AI R&D IWG	Networking and Information Technology Research and Development Program AI R&D Interagency Working Group (US)
CERN	European Organization for Nuclear Research
CEU	Council of the European Union (EU)
CFIUS	Committee on Foreign Investment in the United States
CoR	European Committee of the Regions (EU)
CORDIS	Community Research and Development Information Service (EU)
DARPA	Defense Advanced Research Projects Agency (US)
DG CONNECT	Directorate General for Communication Networks, Content and Technology (EU)
DHS	US Department of Homeland Security
DIH	Digital Innovation Hubs (EU)
DOE	US Department of Energy
DOD	US Department of Defense
DOT	US Department of Transportation
EC	European Commission (EU)
EESC	European Economic and Social Council (EU)
EFSD	European Fund for Strategic Investments (EU)
EIC	European Innovation Council (EU)
EP	European Parliament (EU)
EIB	European Investment Bank (EU)
ENRICH	European Network of Research and Innovation Centers and Hubs (EU)
EU	European Union
EUC	European Council (EU)
FBI	Federal Bureau of Investigation (US)
FDA	US Food and Drug Administration
FTA	Federal Transit Administration (US)
GDPR	General Data Protection Regulation
GPAI	Global Partnership on Artificial Intelligence
GSA	US General Services Administration
G7	Group of Seven
G20	Groups of Twenty
HHS	US Department of Health and Human Services
H2020	Horizon 2020 (EU)
IARPA	Intelligence Advanced Research Projects Activity (US)
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
JAIC	Joint Artificial Intelligence Center (US)

LAWS	Lethal autonomous weapons
MLAI	Machine Learning and Artificial Intelligence
MSCA	Marie Skłodowska-Curie Action (EU)
NASA	National Aeronautics and Space Administration (US)
NATO	North Atlantic Treaty Organization
NIFA	National Institute of Food and Agriculture (US)
NIH	National Institutes of Health (US)
NIJ	National Institute of Justice (US)
NIST	National Institute of Standards and Technology (US)
NITRD	Networking and Information Technology Research and Development Program (US)
NOAA	National Oceanic and Atmospheric Administration (US)
NSF	National Science Foundation (US)
NSTC	National Science and Technology Council (US)
NTIA	National Telecommunications and Information Administration (US)
ODNI	Office of the Director of National Intelligence (US)
OECD	Organization for Economic Cooperation and Development
OMB	Office of Management and Budget (US)
OSAI	European Observatory on Society and Artificial Intelligence
OSTP	Office of Science and Technology Policy (US)
PCLOB	Privacy and Civil Liberties Oversight Board (US)
The Council	The Council of the European Union (EU)
VA	US Department of Veterans Affairs

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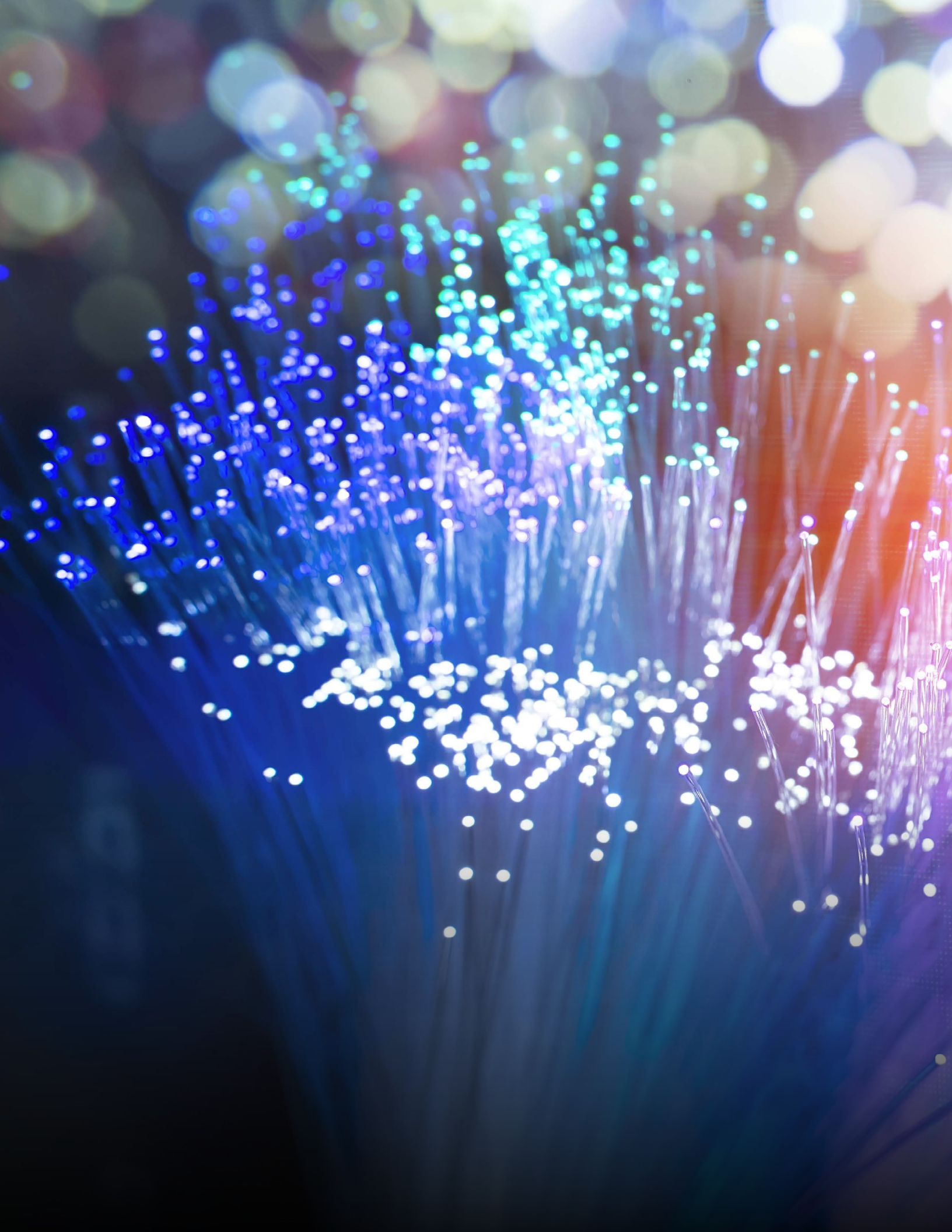
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Executive Summary

After being told in the wake of 9/11 that European and NATO allies pledged to fight Al Qaida alongside American troops, the then United States National Security Advisor Condoleezza Rice said “it was good to have friends in the world at a time like this.”¹ Nicholas Burns, the then US Ambassador to NATO, has since reflected on the importance of the transatlantic alliance. Losing the relationship with NATO and members of the European Union, he believes, would lead the US to “lose our strongest anchor in a dangerous and complex world.”²

The world has changed a lot since September 2001, however these relationships are no less important. Global terrorism is still a threat, but the rise of China and technological advancements have converged to create both new opportunities and new challenges. Artificial intelligence (AI) promises to help the world find a vaccine for Covid-19, add up to \$15.7 trillion to the global economy, and improve militaries’ ability to detect, defend, and deter against cyberattacks.³ However, AI technologies could also provide adversaries and authoritarian governments with tools to increase censorship, automate disinformation, and engage in constant cyber or kinetic conflict.⁴

- 1 This recounting is from Nicholas Burns. See: <https://www.belfercenter.org/publication/experts-weigh-transatlantic-relationship>
- 2 “Experts Weigh in On Transatlantic Relationship” (Harvard Kennedy School Belfer Center for Science and International Affairs, April 24, 2018), <https://www.belfercenter.org/publication/experts-weigh-transatlantic-relationship>.
- 3 Stevent Rosenbush, “In Race to Treat Coronavirus, AI Is Seen as Key” (The Wall Street Journal, March 16, 2020), <https://www.wsj.com/articles/in-race-to-treat-coronavirus-ai-is-seen-as-key-11584351000?tpl=artificialintelligence>; “AI Analysis: Sizing the Prize” (PWC, 2017), <https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf>; “Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our Security and Prosperity” (Department of Defense, February 2019), <https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/SUMMARY-OF-DOD-AI-STRATEGY.PDF>.
- 4 Jason Skowronski, “Trolls and Bots Are Disrupting Social Media - Here’s How AI Can Stop Them” (Medium, July 30, 2019), <https://towardsdatascience.com/trolls-and-bots-are-disrupting-social-media-heres-how-ai-can-stop-them-d9b969336a06>; Miles Brundage et al., “The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation,” February 2018, <https://img1.wsimg.com/blobby/go/3d82daa4-97fe-4096-9c6b-376b92c619de/downloads/MaliciousUseofAI.pdf?ver=1553030594217>; Cade Metz and Scott Blumenthal, “How A.I. Could Be Weaponized to Spread Disinformation” (The New York Times, June 7, 2019), <https://www.nytimes.com/interactive/2019/06/07/technology/ai-text-disinformation.html>; “Welcome to the New Era of Chinese Government Disinformation” (The Diplomat, May 11, 2020), <https://thediplomat.com/2020/05/welcome-to-the-new-era-of-chinese-government-disinformation/>; Paul Mozur, “Inside China’s Dystopian Dreams: A.I., Shame and Lots of Cameras” (The New York Times, July 8, 2018), <https://www.nytimes.com/2018/07/08/business/china-surveillance-technology.html>.

Despite all of these changes, the importance of a strong relationship between the United States and the European Union has been a constant. The transatlantic disagreements that have characterized the past few years—and have hampered a united front on emerging technologies like 5G and AI⁵—are not the first time US-EU relations have suffered, but they should not further divide allies that share common values.⁶ Deepened US-EU cooperation across the entire AI ecosystem⁷ is necessary to advance a more secure, safe, and prosperous world, but to do this the current level of AI-related coordination and partnership needs to be increased.

This report's purpose is twofold: first, to inform policymakers and researchers about the current state of transatlantic AI efforts; and second, to recommend specific areas where transatlantic AI collaboration should be strengthened. Based on a comprehensive study of over 260 documents and reports covering the period from December 1997 to June 2020, we proposes more than 16 recommendations to increase US-EU AI collaboration across the entire AI ecosystem, as well as 9 recommendations for AI cooperation in the healthcare, environmental sciences, and defense sectors. Greater transatlantic efforts are needed to prevent the advancement of an AI vision that is adversarial and harmful to the wellbeing of the United States, the European Union, and allies.

5 Erik Brattberg and Philippe Le Corre, "Huawei and Europe's 5G Conundrum" (Carnegie Endowment for International Peace, December 27, 2018), <https://carnegieendowment.org/2018/12/27/huawei-and-europe-s-5g-conundrum-pub-78045>.

6 Nicholas Burns Ambassador (ret.), "The Transatlantic Relationship in Crisis" (Madrid, Spain, July 6, 2019), <https://www.belfercenter.org/publication/transatlantic-relationship-crisis>.

7 We define the AI ecosystem to include not only the software, algorithms, systems, and data sets required for general AI, machine-learning, and deep learning systems, but also the associated hardware, computing resources, "laws, funding, institutions, policies, talent, intellectual property protection, [and] supply chains" that enable the research, development, and use of AI applications. "Interim Report" (National Security Commission on Artificial Intelligence, November 2019).

The Case for Transatlantic Cooperation

There are three critical, interconnected arguments for transatlantic cooperation to ensure AI innovation protects the security, values, and economic interests of the United States and the European Union.

1. **Global Good:** Transatlantic AI partnerships and cooperation encourages innovation and applications that enhance human welfare, strengthen the economies of the US and the EU, and advance global security.
2. **Great Power Competition:** US-EU leadership of like-minded nations is needed in this age of great power competition to tip the scales against efforts by authoritarian governments—particularly, China and Russia—to undermine democracies.
3. **Shared Values:** The US and the EU share fundamental values and would benefit from joint efforts to establish AI norms that would more effectively advance their common vision of AI and ripple throughout the global AI ecosystem.

Although the US consistently sounds the alarm bells around China's AI aspirations and the EU urges international efforts against AI that violates fundamental rights, increasingly noting China's actions with concern,⁸ little concrete international action has taken place. The United States and the European Union's ongoing reassessment of their respective AI strategies and legislation⁹ provides a window of opportunity to align and collaborate. Transatlantic AI cooperation is at a critical juncture and the United States and the European Union should seize this opportunity to take concrete actions.

8 The EC's *Communication: Artificial Intelligence for Europe* (2018) only explicitly mentions China's investment capacity in AI as a concern. However, the EC's High-Level Expert Group on AI's (AI HLEG) *Policy and Investment Recommendations for Trustworthy* (2019) report underlined the risks generated by "identifying and tracking individuals with AI," "covert AI systems," and "AI enabled citizen scoring in violation of fundamental rights," which underpins China's social credit system.

9 The EU is planning to propose AI-related legislation by the end of 2020.

The Current State

The United States and the European Union are separately assessing and updating their AI strategies. However, it is a myth to assume they are not collaborating at all to advance their AI-related goals. Transatlantic cooperation on AI norms, standards, research and development, and data sharing should increase, but the United States and the European Union can build upon an existing foundation for a stronger alliance.

United States: The United States views American leadership in AI as necessary to safeguard American values and maintain defense and economic superiority. Recognizing the need to develop a national AI approach and reclaim the AI R&D global leadership position from China, which had already surpassed the US in several research output metrics by 2016,¹⁰ the Obama Administration developed an AI R&D prioritization in October 2016.¹¹ Building on this urgency, the Trump Administration has prioritized AI and established the American AI Initiative in February 2019.¹² This Initiative identified the need for a whole-of-government approach to prioritize AI R&D and deployment throughout the entire federal government. The Initiative also identifies the need to grow the US AI workforce, set national and global norms and standards, and work with industry and allies to promote an AI environment favorable to the United States.¹³

The United States' federal government has made key strategic and tactical changes to achieve these goals. Federal AI R&D and the American AI Initiative are coordinated by several committees and subcommittees within the Executive Office. President Trump pledged to more than double

10 Ajay Agrawal, Joshua Gans, and Avi Goldfarb, "The Obama Administration's Roadmap for AI Policy" (Harvard Business Review, December 21, 2016), <https://hbr.org/2016/12/the-obama-administrations-roadmap-for-ai-policy>.

11 Select Committee on Artificial Intelligence of the National Science & Technology Council, "The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update" (Executive Office of the President of the United States, June 2019), <https://www.nitrd.gov/pubs/National-AI-RD-Strategy-2019.pdf>.

12 The American AI Initiative was founded through the Executive Order on Maintaining American Leadership in Artificial Intelligence.

13 "Executive Order 13859: Maintaining American Leadership in Artificial Intelligence" (Executive Office of the President, February 11, 2019).

non-defense AI R&D to \$2 billion by 2022.¹⁴ Federal AI R&D, guided by the National AI R&D Strategic Plan, must now be reported annually for each federal entity.¹⁵ The United States has taken a “light-touch” approach to regulation, fearing overly burdensome laws will stifle innovation. However, guidance is not completely absent. The Office of Management and Budget released a memo to guide Federal agencies as they develop regulatory and non-regulatory approaches to non-government applications of AI and the Department of Defense published five AI principles to guide AI design, deployment, and adoptions in defense.¹⁶

Obstacles to the US realizing its goal of global AI leadership exist, despite the government’s prioritization of it. *Key obstacles include the need to bolster its private sector AI landscape; address regulatory or standards gaps to safeguard American values; repair the breakdown of funding and information sharing relationships between academia, industry, and government; grow its AI workforce; and further increase its federal AI R&D funding.*

European Union: The European Union, like the United States, intends to leverage AI’s potential as a strategic and transformative technology.¹⁷ However, the EU has positioned itself as a leader in trustworthy, human-centric, ethical, and values-based AI,¹⁸ in comparison to the US government’s emphasis on the need for AI innovation to protect American values, civil liberties, and privacy. The EU recognizes that it trails behind the US and China in terms of volume of investment and maturity of its

14 “President Trump’s FY 2021 Budget Commits to Double Investments in Key Industries of the Future” (The White House, February 11, 2020), <https://www.whitehouse.gov/briefings-statements/president-trumps-fy-2021-budget-commits-double-investments-key-industries-future/>.

15 Subcommittee on Networking & Information Technology Research & Development Committee on Science & Technology Enterprise of the National Science & Technology Council, “The Networking & Information Technology Research and Development Program: Supplement to the President’s FY 2020 Budget” (Executive Office of the President of the United States, September 2019).

16 Russell T. Vought, “Memorandum for the Heads of Executive Departments and Agencies: Guidance for Regulation of Artificial Intelligence Applications” (Office of Management and Budget, January 13, 2020), <https://www.whitehouse.gov/wp-content/uploads/2020/01/Draft-OMB-Memo-on-Regulation-of-AI-1-7-19.pdf>.

17 European Commission, “Artificial Intelligence for Europe” (European Commission, April 25, 2018), <https://ec.europa.eu/transparency/regdoc/rep/1/2018/EN/COM-2018-237-F1-EN-MAIN-PART-1.PDF>.

18 High level expert group on AI, “POLICY AND INVESTMENT RECOMMENDATIONS FOR TRUST-WORTHY AI” (Brussels: European Commission, June 29, 2019); European Commission, “Building Trust in Human-Centric Artificial Intelligence” (European Commission, August 4, 2019).

tech industry.¹⁹ Nonetheless, the EU believes it can capitalize on its underlying structural strengths (e.g., academic and innovation record) and on its values to compete globally and reaffirm its digital and technological sovereignty.²⁰ Starting with its 2018 *Communication: Artificial Intelligence for Europe*,^{21, 22} the European Commission (EC) has launched a coordinated effort promoting AI.²³ Policies include increasing public and private investments from \$5.6 billion to \$22 billion annually;²⁴ coordinating research and innovation across Europe; devising ethical guidelines; fostering digital skills in its workforce; and promoting public and private sector adoption of AI.²⁵ To support and counsel these efforts, the EC has established the High-Level Expert Group on AI (AI HLEG) comprising 52 experts who advise the Commission on policy and regulatory changes.

The European Union's Juncker²⁶ Commission (2014-2019) actively avoided regulating AI, causing the European Parliament to increase their efforts as a proactive voice in favor of stronger AI regulation. However, since the beginning of Ursula von der Leyen's tenure, the Commission has initiated efforts to adopt stronger regulation for AI applications (i.e., differentiating regulation of AI based on defined "high-risk" and "low-risk" sectors") and

19 M Craglia et al., "Artificial Intelligence A European Perspective" (Luxembourg: Joint Research Center - European Commission, 2018); Charlotte Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem" (European Commission, February 1, 2019), <https://doi.org/10.13140/RG.2.2.30791.65447>.

20 European Commission, "Artificial Intelligence for Europe," April 25, 2018.

21 A "Communication" is a high-level policy paper which is often part of the standard policy making procedure of the EC.

22 European Commission, "Artificial Intelligence for Europe," April 25, 2018.

23 European Commission; European Commission, "Coordinated Plan on Artificial Intelligence" (European Commission, July 12, 2018); Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem"; European Commission, "Building Trust in Human-Centric Artificial Intelligence."

24 Digital Single Market, "Factsheet: Artificial Intelligence for Europe," 2019; European Commission, "Coordinated Plan on Artificial Intelligence"; Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem"; European Commission, "Building Trust in Human-Centric Artificial Intelligence."

25 European Commission, "Artificial Intelligence for Europe," April 25, 2018; European Commission, "Coordinated Plan on Artificial Intelligence"; Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem"; European Commission, "Building Trust in Human-Centric Artificial Intelligence."

26 Jean-Claude Juncker was the former president of the European Commission, which is the executive body of the European Union.

associated data spaces.^{27,28} These legislative proposals and their associated discussions are planned to be completed by the end of 2020. During the strategic planning and budgeting process of its R&D programs, the EU committed to providing at least EUR10.7 billion²⁹ for AI-related research conducted between 2021 and 2027.³⁰ Despite these financial and political efforts, the EU still remains technologically dependent on the US and China and suffers from a lack of capital and private funding, decentralized and uncoordinated AI expertise, severe brain drain (including to the US), and slow adoption of AI programming in its education and public sectors.

Transatlantic Cooperation: Despite over 40 years of scientific relationships and projects between the United States and the European Union, AI-specific collaboration has been fraught with varying degrees of political and academic skepticism on both side of the Atlantic, notably within the European Commission and the governments of some Member States (e.g., France and Germany).³¹ Such a dynamic is aggravated, in part, by the ever-deteriorating transatlantic relationship spurred by policy and trade disagreements, public spats, and increasing American isolationism. Despite such explicit omissions and stand-offs at the highest levels, transatlantic collaboration for AI does happen, most notably in various multilateral forums working on standards (e.g., ISO, IEC, IEEE, G7, G20) or on ethics

27 According to the EC, European data spaces should entail the clarification and harmonization of data governance models and practices, while setting up the necessary infrastructure to foster the exchange of quality and interoperable data in the respective sectors (e.g., public sector, health or banking sectors) "Annex: All Reports of the Workshops on 'Common European Data Spaces,'" (European Commission, July to November 2019).

28 Mark Scott, "What's Driving Europe's New Aggressive Stance on Tech" (Politico, October 27, 2019), <https://www.politico.eu/article/europe-digital-technological-sovereignty-facebook-google-amazon-ursula-von-der-leyen/>; Tyson Barker, "Europe Can't Win the Tech War It Just Started" (Foreign Policy, January 16, 2020), <https://foreignpolicy.com/2020/01/16/europe-technology-sovereignty-von-der-leyen/>; European Commission, "Annex: All Reports of the Workshops on 'Common European Data Spaces'" (European Commission, Directorate General for Communications Networks, Content and Technology, November 2019), <https://ec.europa.eu/digital-single-market/en/news/stakeholders-dialogue-common-european-data-spaces>.

29 This is roughly equivalent to \$10.63 billion, depending on the exchange rate.

30 "Horizon Europe - the next Research and Innovation Framework Programme," ec.europa, n.d., https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en; European Commission, "Artificial Intelligence," European Commission, July 12, 2018, https://ec.europa.eu/commission/news/artificial-intelligence-2018-dec-07_en.

31 Barker, "Europe Can't Win the Tech War It Just Started"; Thomas Metzinger, Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz, April 14, 2020; Ulrike Esther Franke, Policy Fellow at European Council on Foreign Relations, June 24, 2020.

and norms (e.g., OECD, GPAI³²).³³ In recent months, however, interests and political support for greater transatlantic coordination on AI seems to be increasing. This trend was notably demonstrated by a visit from Lt. Gen. Jack Shanahan—then Director of the US Department of Defense’s Joint Artificial Intelligence Center (JAIC)—to Brussels in January 2020 and a visit by the European Parliament’s delegation to Washington D.C in February 2020. Both visits included discussions on AI with a variety of key stakeholders, such as NATO, representatives from the US Congress, State Department, Federal Transit Administration (FTA), Federal Bureau of Investigation (FBI), and Privacy and Civil Liberties Oversight Board (PCLOB).³⁴

Transatlantic collaboration for AI-related research is taking place at varying levels although these projects are relatively ad hoc and materialize within existing scientific and technological research agreements and roadmaps. For instance, the current *Roadmap for US-EU Science & Technology* prioritizes four areas for transatlantic cooperation, most of which leverage AI (e.g., health, transportation, bioeconomy, marine and arctic research) or promote institutions that do (e.g., European Organization for Nuclear Research or CERN).^{35, 36} These collaborative links are supported and promoted through a variety of arrangements and initiatives, such as BILAT

32 The Global Partnership on AI (GPAI), originally proposed in 2018 by France and Canada as the International Panel on Artificial Intelligence, was formally launched in May 2020 by the G-7 science and technology ministers. The US was originally hesitant to join but has now thrown its support behind the initiative to counter the threat posed by China and authoritarian regimes.

33 Eanna Kelly, “US Joins Global AI Group, Citing Technology Threat from China” (Science Business, May 29, 2020), <https://sciencebusiness.net/international-news/us-joins-global-ai-group-citing-technology-threat-china>; Dave Nyczepir, “The US Joined a Global AI Partnership for Coronavirus Recovery to Stick It to China” (FedScoop, May 28, 2020), <https://www.fedscoop.com/us-global-ai-partnership-china/>; The White House Office of Science and Technology Policy, “Summary of the 2018 White House Summit on Artificial Intelligence For American Industry,” May 10, 2018, <https://www.whitehouse.gov/wp-content/uploads/2018/05/Summary-Report-of-White-House-AI-Summit.pdf?latest#page=13>.

34 Katie Malone, “JAIC Director: Future of Defense AI Relies on Global Collaboration,” MeriTalk, January 17, 2020, <https://www.meritalk.com/articles/jaic-director-future-of-defense-ai-relies-on-global-collaboration/>; European Parliament Liaison Office in Washington DC, “EU-US Relations in Data Protection, AI and Security: MEPs Conclude Visit to US,” European Parliament, February 28, 2020, <https://www.europarl.europa.eu/unitedstates/en/epl-news/eu-us-relations-in-data-protection-ai-and-security-meps-conclude-visit-to-us>; Department of State, “Press Briefing with Air Force Lt. Gen. John Shanahan, Director of Joint Artificial Intelligence Center, US Department of Defense,” [state.gov](https://www.state.gov/120728-2/), January 15, 2020, <https://www.state.gov/120728-2/>.

35 CERN is one of the largest European research organization that operates the largest particle physics laboratory in the world. While not a full member, the US has an observer status and collaborates on a number of projects.

36 European Commission, “Roadmap for EU USA S&T Cooperation” (European Commission, 2017), https://ec.europa.eu/research/iscp/pdf/policy/us%20clean_roadmap_2017.pdf.

4.0, EURAXES³⁷ or the European Network of Research and Innovation Centers and Hubs (ENRICH). In general, and despite challenges to systematically integrating US entities into European research programs, the US remains the leading non-EU (“third country”) participant in Horizon 2020,³⁸ with over 60 participations and 1,200 partnerships.³⁹ US funding contributions to Horizon 2020 and participation in AI-related projects, however, is meager than its broader research involvement in Horizon 2020. For instance, US collaborative links with Horizon 2020 projects can only be found in 2% of AI-related projects, 12% of deep learning projects, and 4% of machine learning-related projects.⁴⁰ Accordingly, there is still plenty of room for improvement.⁴¹

We identified the healthcare, environmental sciences, and defense sectors as areas where the US and EU should prioritize their joint R&D efforts because of existing S&T cooperation, the importance of EU-US alignment for their joint security, and advancement of the “global good.”

Health-related joint R&D is already a top priority within existing EU-US S&T collaboration and benefits from a reciprocal funding agreement between the US NIH and the EU.⁴² Covid-19 and prioritization by both the US and the EU to develop AI applications for healthcare further the potential for stronger US-EU AI collaboration in this sector. The environmental sciences sector similarly benefits from preexisting strong transatlantic collaboration and increased focus for AI-related research. The EU’s focus on developing a “European Green New Deal” will only

37 BILAT 4.0 was a coordination and support project under Horizon 2020, which aimed to enhance and develop science, technology, and innovation (STI) partnerships between the EU and the US. EURAXES is a networking platform for STI that aims to facilitate the mobility of researchers across the world, including in the US.

38 Horizon 2020 is a 6-year (2014-2020) EU research framework. It is used as a policy instrument to implement and fund high-level EU policy initiatives. Its estimated budget is approximately EUR 80 billion.

39 Taken out of the Community Research and Development Information Service (CORDIS), which is the EC’s primary source of results from the projects funded by the EU’s framework programs for research and innovation.

40 Ibid.

41 This is based off original research by the authors. See *Current State: Transatlantic Cooperation* section for more explanation.

42 “Horizon 2020: International Cooperation Opportunities in the WORk PRogramme 2016-2017” (European Commission, Directorate-General for Research and Innovation, 2016), http://ec.europa.eu/research/iscp/pdf/iscp_wp_2016_17.pdf; European Commission, “Roadmap for EU USA S&T Cooperation.”

raise the importance and quantity of European R&D in this field.⁴³ Greater defense-related AI cooperation is increasingly viewed as an imperative by the US, with the DOD Artificial Intelligence Strategy highlighting the need for international AI cooperation to “safeguard a free and open international order.”⁴⁴ Recent positive visits and collaboration between the JAIC, NATO, and European allies indicate AI collaboration in the defense sector will grow.⁴⁵

Challenges to Collaboration & Recommendations

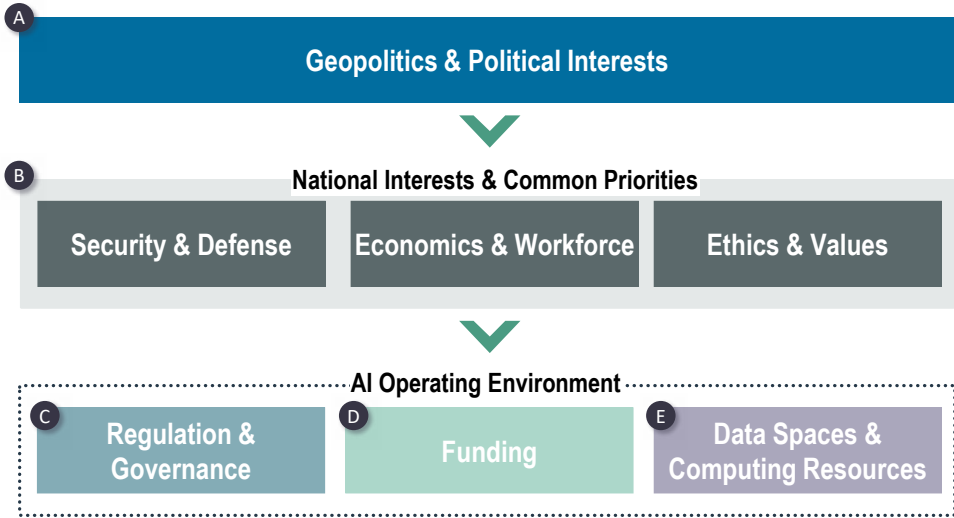
Full US-EU collaboration faces five distinct, but interconnected obstacles (see Figure 1 below). At the highest level, the United States and European Union have some diverging geopolitical interests (section A) illustrated by: America’s increasing isolationism, the European Union’s rebalancing to become a third power, the European Union’s resistance to adversarial discourse about China, and domestic political demands to focus resources on COVID-19 responses. Flowing out of the geopolitical landscape and political interests are three overarching considerations that are bolstered by differing beliefs about the role and size of government and can fuel US-EU disagreements around AI. These US national interests and EU common priorities are (section B): AI’s impact on national security and economic interests, as well as the ethics and values that guide AI’s development and use. Finally, aspects of the AI operating environment (sections C, D, and E), such as regulation and governance (including standards and operationalizing principles), funding, data spaces, hardware, and computing resources, provide tactical areas for disagreement or misalignment.

43 Metzinger, Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz.

44 “Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our Security and Prosperity” (Department of Defense, February 2019), <https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/SUMMARY-OF-DOD-AI-STRATEGY.PDF>; “DOD Unveils Its Artificial Intelligence Strategy” (Defense.gov, February 12, 2019), <https://www.defense.gov/Explore/News/Article/Article/1755942/dod-unveils-its-artificial-intelligence-strategy/>.

45 Malone, “JAIC Director: Future of Defense AI Relies on Global Collaboration”; Nand Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center, May 22, 2020.

Figure 1: Overview of Challenges to Transatlantic Cooperation



These challenges are many but are not insurmountable. We recommend the following 16 actions to facilitate the full realization of US-EU AI collaboration. The complete rationale, recommendation, sub-recommendations, and additional considerations are found in the Challenges to Collaboration & Recommendations section.

Summary of Recommendations

A1	<p>Shift the Narrative from Adversarial to Collaborative: The US should recognize the EU has its own, sometimes competing, interests that will not change through antagonistic demands alone. The EU should soften its stance on certain issues, recognizing both that adversarial rhetoric against the US may threaten collaboration and total technological sovereignty is unlikely.</p>
A2	<p>Increase High-level Engagements: High-level visits highlight the importance placed on US-EU collaboration, enhancing understanding and providing opportunities for greater alignment. Engagements should restart across the full interagency at the highest levels (e.g. Director, Secretary, and Commissioner level) once travel reopens or virtual substitutes are established.</p>
A3	<p>Foster a Like-Minded Coalition: Work together to build a larger coalition of nations that share their AI vision. Combined efforts will act as a force multiplier in strengthening alliances that serve as a counterweight to China and authoritarian regimes' efforts on the global stage.</p>
B1	<p>Establish US-EU Dialogues: Establish a Track 1 dialogue, potentially modelled after the Canada-EU Digital Dialogues, to strengthen relations, communicate points of agreement and disagreement, share best practices, and identify collaboration across the entire AI ecosystem.</p> <p><i>Additional considerations: These dialogues should be inclusive, with not only government officials but also representatives from academia, business, and civil society present, and could be incorporated into existing Track 1 dialogues or an upcoming US-EU summit. Track 1.5 and 2 should supplement this formalized engagement.</i></p> <p>Related recommendations: Dialogue can enable and strengthen the execution of all other recommendations in this paper.</p>
B2	<p>Increase and Formalize AI-Related Joint R&D: Increase joint R&D through various avenues (joint ventures, greater US involvement in Horizon 2020, formal R&D agreement, coordinating international private partnerships). Pool resources for greater impact and larger scale research on topics of importance for both the US and the EU.</p> <p>Sub-recommendation: Research partnerships should span across the entire AI ecosystem, but we believe the healthcare, defense, and environmental sciences sectors should be prioritized, as well as joint efforts to operationalize principles, verification, and standards.</p> <p>Related recommendations: C1, D3</p>

B3	<p>Share Best Practices: Facilitate coordination on priorities and findings, increase capacity building through information sharing and best practices. This can occur between the US and EU's various networks of Centers of Excellence⁴⁶, establishing a shared platform (like BILAT 4.0), or dialogues and networking events.</p> <p>Sub-recommendation: To guide decisions and ensure AI R&D and use respects shared values, a focus on applied AI ethics and operationalizing principles should be at the table.</p> <p>Related Recommendations: B2, B4, B5, C1, E2</p>
B4	<p>Improve Workforce AI Literacy & Strengthen AI Talent: Both the US and the EU need to increase AI literacy throughout their public sectors. Talent exchanges can increase AI alignment and capacity building of employees. US and EU government officials should coordinate on developing AI training. Academia should share best practices on developing AI curriculum for schools and universities.⁴⁷</p> <p>Sub-recommendation: Government, industry, and academia need AI experts and a workforce literate not just in the technical and political aspects of AI, but also its ethical implications.⁴⁸ Joint talent and education efforts should include a focus on AI ethics and trustworthy AI. The NSF's National AI Research Institute on Trustworthy AI should be included.</p> <p>Related Recommendations: B1, B3</p>
B5	<p>Counter Industrial Espionage & Nefarious Private Investment: Intelligence and best practices sharing on identifying and preventing nefarious industry investments and IP theft, can help safeguard the US and EU's economic and security interests. The US and EU should explore options to establish and improve coordination of investment screening practices and information sharing between CFIUS and similar bodies.</p> <p>Related Recommendations: B1, B3</p>
C1	<p>Operationalize Principles, Verification Mechanisms, & Standards: Joint efforts will help: 1) prevent inconsistencies that deepen disagreements, hamper commercial innovation, and preclude companies from entering both markets, and 2) increase their leverage in multilateral institutions to promote their shared AI vision. Track 1, 1.5, and 2 efforts should be pursued and include ethicists.</p> <p>Related Recommendations: B1, B2, C2</p>
C2	<p>Align Future AI-Related Regulation: Track 1 and 1.5 dialogue on AI and data-related regulation can enable communication on rationales and concerns about proposals. More formalized coordination should occur early in the political process and can help prevent inconsistencies that hurt industry.</p> <p>Related Recommendations: B1</p>

46 The United States' GSA has an AI Center of Excellence focused on AI applications within government and NSF will establish National AI Research Institutes in partnership with academia and other Departments. The EU is in the process of establishing various networks of Centers of Excellence and European Digital Innovation Hubs.

47 The EU is currently working on Artificial Intelligence and Analytics in their Digital Education Action Plan; the US could learn from this commission's work and provide beneficial input.

48 Metzinger, Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz.

D1	<p>Increase US Involvement in Horizon 2020 and Horizon Europe: As a key EU research policy tool US participation is important and provides an existing avenue to increase joint research. The US should increase its funding contribution and the EU should designate the US as a third-country party.</p> <p>Related Recommendations: B1, B2</p>
D2	<p>Include the US in Future EU AI Mega-projects: The EU should include US researches in its planned AI mega-project⁴⁹ to enable collaboration and research. If the US undertakes a similar project, EU researchers should be included.</p> <p>Related Recommendations: B1, B2</p>
D3	<p>Build on Existing US-EU Government Collaboration: The NITRD AI R&D Interagency Working Group (WG) should conduct a survey of existing collaboration with European partners across all 24 federal agencies under its purview. The WG should identify and remediate impediments to collaboration and further AI research that can build on existing research projects and relationships. The EU and its Member States should conduct a similar survey.</p> <p>Related Recommendations: B2, B1</p>
E1	<p>Enable Data Sharing for R&D: As the EU is pursuing the creation of sector-specific data spaces and open datasets, the US and the EU should: 1) coordinate their data collection, sharing, use, re-use, access, and storage rules and standards, as well as 2) coordinate agreements to enable researchers have access to data spaces and relevant datasets.</p> <p>Sub-recommendation: 1) Focusing on “low-risk” sectors (e.g., environmental sciences), as defined by the EU’s AI HLEG, may be the most politically expedient as a starting point. 2) The USMCA’s Digital Trade Chapter can be used as a model for an open data agreement.</p> <p>Related Recommendations: B1, B2, C2, E2</p>
E2	<p>Address Domestic Data Sharing Impediments to R&D: Prioritize increasing domestic access to data spaces and datasets across government, industry, and academia. This will decrease challenges to transatlantic data sharing and joint R&D.</p> <p>Related Recommendations: E1, B1, B2, B3</p>
E3	<p>Identify Countries’ Comparative Advantage in the Supply Chain: Collaboratively identify countries, including members of a like-minded coalition, with a comparative advantage in producing and sourcing parts of AI-related hardware and resources.</p> <p>Related Recommendations: A3</p>

49 European researchers have called for a CERN for AI, European Lab for Learning and Intelligent Systems (ELLIS), and the Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAIRE).

Recommendations for Healthcare, Environmental Sciences, & Defense Sectors

The healthcare, defense, and environmental sciences sectors should be prioritized in joint AI partnerships. There is existing US-EU collaboration in all three areas, they will continue to be of global importance, and alignment can be improved to the benefit both sides. We provide three specific recommendations for the healthcare sector, two recommendations for the environmental sciences sector, and four recommendations for the defense sector. The full rationale, recommendation, sub-recommendations, and additional considerations can be found in the following sections: Healthcare Recommendations, Environmental Sciences Recommendations, and Defense Recommendations.

Healthcare

F1	<p>Focus AI Healthcare Research Related to Pandemics on Detection, Diagnosis, and Treatment: COVID-19 highlights the necessity of international cooperation in addressing global pandemics. The US and the EU should explore, identify, and fund joint R&D on detecting (natural language processing, social media scanning), diagnosing (focus on few-shot and transfer learning⁵⁰, ⁵¹), and treating (deep learning to generate novel drugs) pandemics.</p> <p>Related Recommendations: B2, D3, D5, E1</p>
F2	<p>Convene Experts and Policymakers to Address Legal and Ethical Obstacles: Including healthcare experts, lawyers, ethicists, government officials, businesses, and other relevant experts to reflect on the challenges arising from AI applications in healthcare and COVID-19 and propose policy, technical, and legal/regulatory options to address obstacles.</p> <p>Related Recommendations: B1, B3, C1, C2, E2</p>

50 Few-shot learning refers to machine learning algorithms that learn from a few data points or examples. One-shot and zero-shot learning refers to AI that can use one or zero data points respectively. Few-shot learning has gained momentum as a field of research particularly after Google DeepMind published [Matching Networks for One Shot Learning](#) in 2016. Transfer learning refers to AI that, although trained to do one task, can adapt to do a similar task.

51 Rob Toews, "Questioning the Long-Term Importance of Big Data in AI" (Forbes, November 4, 2019), <https://www.forbes.com/sites/robtoews/2019/11/04/questioning-the-long-term-importance-of-big-data-in-ai/#6b08938a2177>; Will Douglas Heaven, "AI Could Help with the Next Pandemic--But Not With This One" (MIT Technology Review, March 12, 2020), <https://www.technologyreview.com/s/615351/ai-could-help-with-the-next-pandemicbut-not-with-this-one/>.

F3	<p>Provide Best Practices for Regulators: AI applications pose new challenges to regulators working within legal frameworks that are outdated and ill-equipped to guide oversight of emerging technologies. The US and the EU should establish a mechanism for their regulators (FDA, EMA, other relevant government agencies) to share best practices on oversight of AI healthcare applications.</p> <p><i>Related Recommendations: B1, B3, C1, C2</i></p>
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Environmental Sciences

G1	<p>The US Should Contribute Research to the EU's Green New Deal: The EU is currently reviewing how the Green New Deal can help restart the economy, promote sustainable development, and increase innovation in emerging technologies like AI. The US and the EU should identify and fund joint research and development projects under this EC policy initiative.</p> <p><i>Related Recommendations: B2, D1, D3, E1</i></p>
G2	<p>Establish a Joint Funding Mechanism for Environmental Sciences AI R&D: The US and the EU should explore funding for environmental sciences research, either as part of Horizon 2020, Horizon Europe, or as a separate agreement. This can be modelled after the reciprocity agreement between the EC and the US National Institutes of Health, National Science Foundation, and the Bill and Melinda Gates Foundation for health research.⁵² Climate-related research, should be prioritized.</p> <p><i>Related Recommendations: D1</i></p>

Defense

H1	<p>Shift the Narrative Away from Lethal Autonomous Weapons (LAWS): The development of lethal autonomous weapons is causing tension that may prohibit substantive discussion around new areas for collaboration. The US and the EU should shift the conversation away from potential disagreement around LAWS and towards shared defense priorities such as ensuring military interoperability separate from autonomous weapons development.</p> <p><i>Related Recommendation: A2</i></p>
H2	<p>Relax Restrictions on Third-Country Funding, IP Rights: The EU should consider reviewing and changing its EDF and PESCO regulations, allowing non-EU companies to receive funds and maintain IP rights in certain collaborative research projects. The EU and member state governments should consider not replicating these restrictions in other defense-related R&D mechanisms and collaborative efforts with the US.</p>

52 BILAT 4.0, "EU-US STI COOPERATION PATTERNS—STATUS QUO" (European Union's Horizon 2020 Research and Innovation Programme, 2016), 0, https://www.euussciencetechnology.eu/assets/content/Deliverables/BILAT_USA_4.0_Deliverable_2.1_Report_on_Status_quo_and_EU-US_STI_Cooperation_patterns_v1_forweb.pdf.

H3	The US and the EU should Strengthen their Defense-Related AI Talent: The US and the EU should work together to pool their defense AI talent to address workforce gaps. This could include defense-related talent exchanges, talent exchanges/secondments into industry to strengthen AI literacy and skills, coordination on AI training and educational programs, and sharing of associated best practices.
H4	Increase Efforts to Share Defense-Related Data: The US and the EU should remove obstacles to sharing defense and intelligence-related data where appropriate. They should also fund and prioritize addressing challenges to data sharing through NATO. Efforts should begin immediately as data sharing and governance projects are often lengthy undertakings. Projects focused on achieving a specific, concrete goal should lay the groundwork for larger-scale, general efforts. ⁵³

53 Informed by interviews with Nand Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center, and Ulrike Esther Franke, Policy Fellow at European Council on Foreign Relations.



Introduction

COVID-19 has put into excruciating focus cracks not only in countries' domestic capacity to keep their citizens safe and secure but also in the international system's resiliency. As countries, particularly the US, struggle to contain the pandemic while mitigating the economic fall-out, politicians have taken varying degrees of responsibility for their countries' successes and failures, with populist rhetoric and state-sponsored information operations on the rise.⁵⁴ However, one response has remained rather consistent across the globe: national governments and researchers are looking to technological developments in Artificial Intelligence (AI) and machine learning (ML) to help overcome the crisis.

Both the United States and European Union hope that open data and AI advancements will help track Covid-19's spread, provide clarity around its infection rate and lethality, and fast-track the race to a cure. The White House announced on 16 March that it had collaborated with various research institutions to create a machine-readable dataset on COVID-19, and it called upon "the Nation's artificial intelligence experts" to use the COVID-19 Open Research Dataset (CORD-19) to "help the science community answer high-priority scientific questions."⁵⁵ The European Commission followed suit and made a similar call on 20 April for European researchers to use the EU COVID19 Data Platform, as the EU's Commissioner for Innovation, Research, Culture, Education and Youth Mariya Gabriel stated, "[to] better understand, diagnose and eventually overpower the pandemic."⁵⁶ Hoping to protect citizens and further the utility of mobile contact tracing, US tech giants Apple and Google as well as EU Member States, with the support of the European Commission, published guidelines to facilitate the interoperability of various mobile

54 "Welcome to the New Era of Chinese Government Disinformation" (The Diplomat, May 11, 2020), <https://thediplomat.com/2020/05/welcome-to-the-new-era-of-chinese-government-disinformation/>.

55 "Call to Action to the Tech Community on New Machine Readable Covid-19 Dataset" (Office of Science and Technology Policy at the White House, March 16, 2020), <https://www.whitehouse.gov/briefings-statements/call-action-tech-community-new-machine-readable-covid-19-dataset/>; "CORD-19: COVID-19 Open Research Dataset" (Semantic Scholar Team at the Allen Institute for AI, n.d.), <https://www.semanticscholar.org/cord19>.

56 Natash Lomas, "EU Data Portal Launches to Support COVID-19 Research" (TechCrunch, April 20, 2020), <https://techcrunch.com/2020/04/20/eu-data-portal-launches-to-support-covid-19-research/>.

applications.⁵⁷ Researchers used data-mining of newspaper articles and ML to identify new outbreaks and project COVID-19's spread, while image detection ML was used to diagnose from CT scans.⁵⁸ XtalPi—a company with offices in Cambridge, Massachusetts and Shenzhen, China—winnowed down the list of 2,900 approved drugs and identified 38 to investigate as treatment options.⁵⁹

Although AI and ML technologies could provide solutions to the pandemic, examples of nations' weaponization of AI illustrates the potential for malevolent application of the technology. The Chinese and Russian governments have used automated "bots" to spread disinformation about COVID-19's origin, seeking to undermine public trust in the US and European governments.⁶⁰ Unintentional encroachments on privacy are also on the rise. For example, the Indian government's requirement that individuals living in certain outbreak zones download a contact tracing app that links to users' bank accounts, but constantly collects location data, raises serious concerns.⁶¹

COVID-19 will cause nations not only to rethink their supply chains, healthcare systems, and economic social programs, but also assess how technologies like AI impact geopolitics and can help, or hurt, countries' ability to govern. The pandemic has thrust into the spotlight the importance of an allied effort—founded on a shared commitment to democracy and the rule of law—to compete with China and authoritarian uses of AI.⁶² The United States and the European Union must recognize this moment for its significance: instead of continuing down siloed paths to counter

57 "Apple and Google Partner on COVID-19 Contact Tracing Technology" (Apple, April 10, 2020), <https://www.apple.com/newsroom/2020/04/apple-and-google-partner-on-covid-19-contact-tracing-technology/>; "Privacy-Preserving Contact Tracing" (Apple and Google, May 2020), <https://www.apple.com/covid19/contacttracing>; "Coronavirus: A Common Approach for Safe and Efficient Mobile Tracing Apps Across the EU" (European Commission, May 13, 2020), <https://ec.europa.eu/digital-single-market/en/news/coronavirus-common-approach-safe-and-efficient-mobile-tracing-apps-across-eu>.

58 Heaven, "AI Could Help with the Next Pandemic--But Not With This One."

59 Stevent Rosenbush, "In Race to Treat Coronavirus, AI Is Seen as Key" (The Wall Street Journal, March 16, 2020), <https://www.wsj.com/articles/in-race-to-treat-coronavirus-ai-is-seen-as-key-11584351000?tpl=artificialintelligence>.

60 "Welcome to the New Era of Chinese Government Disinformation."

61 Andrew Clarence, "Aarogya Setu: Why India's Covid-19 Contact Tracing App Is Controversial" (BBC News, Delhi, May 15, 2020), <https://www.bbc.com/news/world-asia-india-52659520>.

62 Wess Mitchell, "Covid-19 Is a Chance for the US and Europe to Unite on China" (The Washington Post, April 2020), <https://www.washingtonpost.com/opinions/2020/04/03/covid-19-is-chance-us-europe-unite-china/>.

Chinese efforts to dominate AI, the US and the EU should join efforts to ensure their safety, security, prosperity, and values survive threats from adversaries.

This report seeks to meaningfully contribute to the renewed discussion around international AI collaboration and renewing the transatlantic relations. Therefore, the report's purpose is twofold: first, to inform policy-makers and researchers about the current state of transatlantic AI efforts, and second, to recommend specific areas whereby transatlantic AI collaboration should be strengthened. The report first details the argument for increased collaboration as well as the current state of AI efforts undertaken by the US and the EU—separately and jointly. We then describe overarching challenges to a joint AI agenda before recommending 25 specific actions, spanning across the diplomatic and technical AI ecosystem. The report concludes with three case studies, where we have detailed three specific sectors—healthcare, environmental sciences, and defense—that should be prioritized in joint AI efforts.

The Case for Transatlantic AI Cooperation

AI increasingly permeates our everyday lives—through Alexa-provided weather forecasts⁶³ and optimized Uber ETAs⁶⁴—and dominates policymakers’ debates about its economic, national security, and privacy implications. The fast pace of AI innovation and the corresponding proliferation of novel use cases and its impact make it clear that AI will alter our societies and economies. As the United States and European Union independently evaluate how they can capture AI’s full potential, transatlantic cooperation must be part of their equation for success.

There are three key reasons the United States and the European Union must increase collaboration across the entire AI ecosystem.

4. **Global Good:** Transatlantic AI partnerships and cooperation encourages innovation and applications that enhance human welfare, strengthen the economies of the US and the EU, and advance global security.
5. **Great Power Competition:** US-EU leadership of like-minded nations is needed in this age of great power competition to tip the scales against efforts by authoritarian governments—particularly China and Russia—to undermine democracies.
6. **Shared Values:** The US and the EU share fundamental values and would benefit from joint efforts to establish AI norms that would more effectively advance their common vision of AI and ripple throughout the global AI ecosystem.

The ongoing assessments by both the US and the EU on their respective AI strategies—including their investment, priorities, norms, regulations, and AI operational environment—provides a window of opportunity for

63 Jordan Novet and Adam Isaak, “Why Apple’s Siri Isn’t as Smart as Amazon Alexa and Google Assistant” (CNBC, June 4, 2019), <https://www.cnbc.com/2019/06/04/why-siri-is-not-as-smart-as-alexa-google-assistant.html>.

64 Wayne Cunningham, “Science at Uber: Powering Machine Learning at Uber” (Uber, September 10, 2019), <https://eng.uber.com/uber-science-machine-learning-platform/>.

substantive collaboration. The US and the EU should seize upon this critical juncture and deepen cooperation for mutual benefit.

Transatlantic Cooperation for the “Global Good”

Thanks to major technological advances driven by the increased availability of data, greater computing power, and novel AI techniques, as well as the expanding application of AI across the public and private-sectors, AI has shown its immense potential to drive positive societal development, greater defense capabilities, and economic growth.⁶⁵

AI-based solutions can be used to face a variety of challenging issues such as detecting dementia progression in MRI scans, detecting and tracking wildfires, and speeding up grant application processes.⁶⁶ AI also presents new opportunities for improving national and global security through improved automated defense capabilities, enhanced intelligence collection, and overarching modernization of security and military forces and operations.⁶⁷ For example, AI defense applications include scanning aerial footage to identify hostile actors, automating jet maintenance schedules and cyber threat detection, improving tools for decision-making, and

65 “Ethics Guidelines for Trustworthy AI,” Independent High-Level Expert Group on Artificial Intelligence (European Commission, April 8, 2019); Kelley Saylor, “Artificial Intelligence and National Security” (Congressional Research Service, November 21, 2019), <https://fas.org/sgp/crs/natsec/R45178.pdf>.

66 Rosenbush, “In Race to Treat Coronavirus, AI Is Seen as Key”; “Artificial Intelligence Helps Early Detection of Dementia” (Eureka, Eurostars, April 5, 2018), <https://eurostars-eureka.eu/content/artificial-intelligence-helps-early-detection-dementia>; “Running Projects: Euripides2” (Eureka, Euripedes2, n.d.), <https://www.euripedes-eureka.eu/projects>; “Safe Rescue: ITEA3” (Eureka, ITEA3, n.d.), <https://itea3.org/project/safe-rescue.html>; “Cyber Factory No. 1: Key Capabilities of the Project” (Eureka, Cyber Factory No. 1, 2019), <https://www.cyberfactory-1.org/en/project-description/key-capabilities/>; The White House Office of Science and Technology Policy, “Summary of the 2018 White House Summit on Artificial Intelligence For American Industry,” May 10, 2018, <https://www.whitehouse.gov/wp-content/uploads/2018/05/Summary-Report-of-White-House-AI-Summit.pdf?latest#page=13>.

67 Simona R. Soare, “Transatlantic Defence Cooperation on Artificial Intelligence” (European Union Institute for Security Studies, March 5, 2020), https://www.iss.europa.eu/sites/default/files/EUISSFiles/Brief%203%20AI_0.pdf; “DOD Unveils Its Artificial Intelligence Strategy”; “Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our Security and Prosperity”; Saylor, “Artificial Intelligence and National Security.”

identifying cost-saving organizational enhancements.⁶⁸ AI could also reduce the overall level of violence in conflict by providing alternatives to kinetic battlefield options.⁶⁹

Furthermore, AI promises to grow the global economy through both efficiency and labor productivity gains as well as increased customer demand driven by AI-fueled product enhancements and personalization.⁷⁰ Indeed, some experts argue that AI will match capital and labor as the third pillar of production.⁷¹ Generous quantitative assessments estimate AI's impact on increased global economic activity at up to \$15.7 trillion. AI could be the biggest opportunity to for private sector commercial growth.⁷² While such increases in productivity remain to be seen, these aspirations have led to a 7.7% increase in investor funding of AI-related startups over the previous year to \$7.41 billion in one quarter alone in 2019.⁷³ The top 100 AI startups in 2020, raised over \$7.4 billion in funding and span across 15 core industries but are notably in healthcare, retail, and transportation.⁷⁴ Furthermore North American and European startups dominated the list, with 65% in the US, 15% in Europe, and 8% in Canada, with only 6% of the startups in China.⁷⁵

Like many past technological advances—such as the splitting of the atom—AI is a double-edged sword that carries abundant risks and opportunities

68 European Union Institute for Security Studies, *THE EU, NATO AND ARTIFICIAL INTELLIGENCE - New Possibilities for Cooperation?* (EU ISS, 2019), <https://www.iss.europa.eu/sites/default/files/EUISSFiles/EU%20NATO%20AI%20-%20Report.pdf>; "Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our Security and Prosperity"; "DOD Unveils Its Artificial Intelligence Strategy"; Saylor, "Artificial Intelligence and National Security."

69 European Union Institute for Security Studies, *THE EU, NATO AND ARTIFICIAL INTELLIGENCE - New Possibilities for Cooperation?*

70 "AI Analysis: Sizing the Prize" (PWC, 2017), <https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf>; "Notes from the AI Frontier: Modeling the Impact of AI on the World Economy" (McKinsey Global Institute, September 4, 2018), <https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy>.

71 "AI Analysis: Sizing the Prize"; Andrea Renda, "Artificial Intelligence: Ethics, Governance, and Policy Challenges" (Brussels: Centre for European Policy Studies Task Force, February 2019).

72 "AI Analysis: Sizing the Prize"; "Notes from the AI Frontier: Modeling the Impact of AI on the World Economy."

73 Jared Council, "Health Care, Sales Software Draw Big AI Investments" (The Wall Street Journal, July 30, 2019), <https://www.wsj.com/articles/health-care-sales-software-draw-big-ai-investments-11564479007?mod=searchresults&page=2&pos=14>.

74 "AI 100: The Artificial Intelligence Startups Redefining Industries" (CB Insights, March 3, 2020), <https://www.cbinsights.com/research/artificial-intelligence-top-startups/>.

75 The European startups included 8 in the United Kingdom, 2 in Sweden, 2 in Germany, 1 in France, 1 in Spain, and 1 in Switzerland.

for abuse. The dual-use nature of AI enables its intentional malicious use, and equivocal standards for its development makes possible unintentional harm.^{76, 77} AI systems can be developed or re-purposed to eliminate privacy and violate individuals' fundamental rights.⁷⁸ Authoritarian regimes could follow China's example and use facial-recognition-enabled cameras to track citizens, display pictures of lawbreakers to encourage public shaming, and hasten political suppression.⁷⁹ Automated "social media bots" increase the ability of countries, like Russia, to execute disinformation campaigns that sow discord, manipulate elections and public sentiment, and undermine democracy.⁸⁰ Increasingly autonomous drones and weapons, particularly lethal autonomous weapons (LAWS), could cause military operations to escalate into never-ending conflicts, spur a great power AI arms race, or enable non-state actors in their attempts to destabilize regions.⁸¹ Furthermore, unchecked AI systems may unintentionally discriminate and reinforce prejudice; for example, through criminal justice algorithms that inaccurately bias against black defendants or Amazon's hiring algorithm that favors words that men use on resumes.⁸² Finally, uneven AI adoption throughout industry and organizations, automation that displaces workers, and lagging skills development (e.g., insufficient academic opportunities and workforce training) could lead to a missed

76 The EU Ethics Guidelines highlights these risks are particularly significant in sectors like healthcare and law enforcement where individuals may levy asymmetric power over legal outcomes or sensitive personal data. (Ethics Guidelines for Trustworthy AI, European Commission's High-Level Expert Group on AI, April 8, 2019.)

77 "Interim Report"; "Ethics Guidelines for Trustworthy AI"; Miles Brundage et al., "The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation," February 2018, <https://img1.wsimg.com/blobby/go/3d82daa4-97fe-4096-9c6b-376b92c619de/downloads/MaliciousUseofAI.pdf?ver=1553030594217>.

78 Brundage et al., "The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation."

79 Paul Mozur, "Inside China's Dystopian Dreams: A.I., Shame and Lots of Cameras" (The New York Times, July 8, 2018), <https://www.nytimes.com/2018/07/08/business/china-surveillance-technology.html>.

80 Jason Skowronski, "Trolls and Bots Are Disrupting Social Media - Here's How AI Can Stop Them" (Medium, July 30, 2019), <https://towardsdatascience.com/trolls-and-bots-are-disrupting-social-media-heres-how-ai-can-stop-them-d9b969336a06>; Cade Metz and Scott Blumenthal, "How A.I. Could Be Weaponized to Spread Disinformation" (The New York Times, June 7, 2019), <https://www.nytimes.com/interactive/2019/06/07/technology/ai-text-disinformation.html>; Brundage et al., "The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation."

81 Kelsey Atherton, "We Are On the Verge of a No-Win AI Arms Race, Warns NGO" (Military Times, May 9, 2019), <https://www.militarytimes.com/unmanned/2019/05/09/we-are-on-the-verge-of-a-no-win-ai-arms-race-warns-ngo/>; Saylor, "Artificial Intelligence and National Security"; Brundage et al., "The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation."

82 James Manyika, Jake Silberg, and Brittany Preston, "What Do We Do About the Biases in AI?" (Harvard Business Review Press, October 25, 2019), <https://hbr.org/2019/10/what-do-we-do-about-the-biases-in-ai>; "Ethics Guidelines for Trustworthy AI."

economic opportunity that some studies estimate constitutes a combined loss of \$11.5 trillion in GDP growth across the G20 economies.⁸³

Despite the enormous potential for AI to either advance the global good or heighten global risks, many aspects of AI's development, use, and governance remain in their infancy. The direction AI will take is not written in stone. In light of the first-mover advantage and tremendous necessity to leverage all available resources, the US and the EU should pool their strengths—talent, innovation, funding, shared respect for the rule of law and rights, and geopolitical influence—to harness and guide the development of AI. The US and the EU must work together and ensure a long-term course where positive disruption prevails, and the US and the EU prosper.

US-EU Leadership in Great Power Competition

The importance of US-EU collaboration for the global good is underscored by what many have described as “the global race for AI dominance”.⁸⁴ This geopolitical competition is between competing paradigms: an illiberal model led by China but supported by other revisionist and authoritarian states, and a values-based model supported by mostly democratic states. Both models seek to harness the economic, societal and military potential of AI while keeping the other at bay. This arms race is encapsulated in Putin's now famous remark: “Artificial intelligence is the future, not only for Russia, but for all humankind...Whoever becomes the leader in this sphere will become the ruler of the world.”⁸⁵

Putin's quote may have captured the headlines, but China's whole-of-government AI strategy is the centerpiece of politicians' anxieties in the US

83 “It's Learning, Just Not As We Know It.” (Accenture, 2018), https://www.accenture.com/t20180920T094705Z_w_us-en_acnmedia/Thought-Leadership-Assets/PDF/Accenture-Education-and-Technology-Skills-Research.pdf.

84 Greg Williams, “Why China Will Win the Global Race for Complete AI Dominance” (Wired, April 16, 2018), <https://www.wired.co.uk/article/why-china-will-win-the-global-battle-for-ai-dominance>; “The Global Race for AI” (European Commission, n.d.), <https://ec.europa.eu/jrc/en/facts4eufuture/artificial-intelligence-european-per>.

85 Adrian Pecotic, “Whoever Predicts the Future Will Win the AI Arms Race” (Foreign Policy, March 5, 2019), <https://foreignpolicy.com/2019/03/05/whoever-predicts-the-future-correctly-will-win-the-ai-arms-race-russia-china-united-states-artificial-intelligence-defense/>.

and, to a lesser extent, the EU. China's 2017 "New Generation Artificial Intelligence Plan," is the latest state-led plan to dominate in key technologies and associated hardware like semiconductors.⁸⁶ China seeks to become the world's primary AI innovation center by 2030 with an AI industry valued at RMB 1 trillion (roughly \$150 billion).⁸⁷ To achieve this vision, central and local governments work hand-in-hand with academia, industry, and funding entities across the AI ecosystem.⁸⁸ China's AI strategy paves the way for AI dominance and ubiquitous AI technologies throughout the country incorporating both military and civilian AI applications.⁸⁹

China is putting its money where its mouth is. Given current trends, China is expected to surpass US overall R&D within the next ten years.⁹⁰ Although the exact amount of money China is spending on AI is unknown, experts estimate it is in the tens of billions: the Made in China 2025 plan itself is expected to receive \$1.68 trillion in investment, while the "New Generation Plan" has already received pledges from two regional governments to invest around \$14.7 billion each.⁹¹ To spur private investment, China is providing tax breaks, streamlining regulation, and offering government contracts.⁹² Although the US companies have historically received the most amount of global private investment funding, China's

86 Indermit Gill, "Whoever Leads in Artificial Intelligence in 2030 Will Rule the World Until 2100" (Brookings, January 17, 2020), <https://www.brookings.edu/blog/future-development/2020/01/17/whoever-leads-in-artificial-intelligence-in-2030-will-rule-the-world-until-2100/>; James McBride and Andrew Chatzky, "Is 'Made in China 2025' A Threat to Global Trade?" (Council on Foreign Relations, May 13, 2019), <https://www.cfr.org/backgrounder/made-china-2025-threat-global-trade>; Gregory C. Allen, "Understanding China's AI Strategy" (Center for New American Security, February 6, 2019), <https://www.cnas.org/publications/reports/understanding-chinas-ai-strategy>.

87 Paul Mozur, "Beijing Wants A.I. to Be Made in China by 2030" (The New York Times, July 20, 2017), <https://www.nytimes.com/2017/07/20/business/china-artificial-intelligence.html>; Arjun Kharpal, "China Wants to Be a \$150 Billion World Leader in AI in Less than 15 Years" (CNBC, July 21, 2017), <https://www.cnbc.com/2017/07/21/china-ai-world-leader-by-2030.html>; Graham Webster et al., trans., "Full Translation: China's 'New Generation Artificial Intelligence Development Plan' (2017)" (New America, August 1, 2017), newamerica.org/cybersecurity-initiative/digichina/blog/full-translation-chinas-new-generation-artificial-intelligence-development-plan-2017/; "Next Generation Artificial Intelligence Development Plan Issued by State Council: China's Strengths Creates Innovation Miracles," China Science & Technology Newsletter (Beijing, China: Department of International Cooperation, Ministry of Science and Technology (MOST), P.R. China, September 15, 2017), <http://fi.china-embassy.org/eng/kxjs/P020171025789108009001.pdf>.

88 Fabian Westerheide, "China - The First Artificial Intelligence Superpower," *Forbes*, January 14, 2020, <https://www.forbes.com/sites/cognitiveworld/2020/01/14/china-artificial-intelligence-superpower/#6ec2b0c32f05>.

89 Renda, "Artificial Intelligence: Ethics, Governance, and Policy Challenges."

90 "Interim Report."

91 Allen, "Understanding China's AI Strategy"; Gill, "Whoever Leads in Artificial Intelligence in 2030 Will Rule the World Until 2100."

92 Westerheide, "China - The First Artificial Intelligence Superpower."

efforts are starting to pay off.⁹³ As the percentage of global AI deals are increasing in China.⁹⁴ Cities like Tianjin and Shanghai have flourishing, multi-billion-dollar venture capital funds.⁹⁵ These financial measures are supplemented by China's attempts to increase its AI talent by attracting thousands of foreign researchers through the Thousand Talents Plan and developing the expertise of its own workforce, particularly by adding about 400 AI-related majors to university instruction.⁹⁶ Although citations are not the definitive measure of AI innovation, it is an indicator of progress and some experts predict that Chinese research will soon surpass citations of American AI research, indicating the potential dominance of Chinese AI research.⁹⁷

This race for AI dominance has fueled US efforts to proactively pursue a policy of “decoupling” their economies. Through export controls, tariffs, quotas, prohibitions on activities, CFIUS⁹⁸ reviews, investment in domestic and allied industries, and international politicking, the US approach seeks to remove some American supply chains from China, eliminate the trade deficit with China, and stop China's progress towards AI and

93 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).

94 For example, out of all global AI deals, Chinese firms accounted for only 4% in 2014 but 13% in 2019.

95 “China Is Starting to Edge Out The US in AI Investment” (CB Insights, February 12, 2019), <https://www.cbinsights.com/research/china-artificial-intelligence-investment-startups-tech/>; Jared Council, “More AI Investments Flow to China, Other Countries Beyond US,” January 23, 2020, <https://www.wsj.com/articles/more-ai-investments-flow-to-china-other-countries-beyond-u-s-11579775401>; Fabian Westerheide, “China - The First Artificial Intelligence Superpower,” *Forbes*, January 14, 2020, <https://www.forbes.com/sites/cognitiveworld/2020/01/14/china-artificial-intelligence-superpower/#6ec2b0c32f05>.

96 Ellen Barry and Gina Kolata, “China's Lavish Funds Lured US Scientists. What Did It Get in Return?” (The New York Times, February 6, 2020), <https://www.nytimes.com/2020/02/06/us/chinas-lavish-funds-lured-us-scientists-what-did-it-get-in-return.html>; Minghe Hu, “A Magnet for Overseas Talent, US Might Lose AI Race If Restrictive Immigration Policies Remain, Says Report” (South China Morning Post, September 18, 2019), <https://www.scmp.com/tech/policy/article/3027672/magnet-overseas-talent-us-might-lose-ai-race-if-restrictive-immigration>; “Interim Report” (National Security Commission on Artificial Intelligence, November 2019).

97 “Interim Report”; James Vincent, “China Is About to Overtake America in AI Research” (The Verge, March 14, 2019), <https://www.theverge.com/2019/3/14/18265230/china-is-about-to-overtake-america-in-ai-research>.

98 The Committee on Foreign Investment in the United States is describes on the US Department of the Treasury's website as “an interagency committee authorized to review certain transactions involving foreign investment in the United States and certain real estate transactions by foreign persons, in order to determine the effect of such transactions on the national security of the United States.” The scope of CFIUS has dramatically expanded to address China's use of FDI to acquire technology and intellectual property. <https://home.treasury.gov/policy-issues/international/the-committee-on-foreign-investment-in-the-united-states-cfius>; <https://fortune.com/2020/01/20/cfius-rules-regulations-china-investment/>

technology market dominance.⁹⁹ This policy has already resulted in a decrease in US-Chinese foreign-direct investment, with Chinese investment in the US dropping in 2019 to \$4.8 billion, the lowest amount since 2011.¹⁰⁰ US investment in China similarly dropped from \$14 billion in the previous year to 13 billion.¹⁰¹ Aggressive actions by the US to demarcate research in AI and advance US technologies, however, might backfire. The US innovative base—both in industry and within academic institutions—has relied on Chinese talent and without significant efforts to grow the domestic or allied workforce, a US AI talent gap will likely result.¹⁰² Furthermore, the decoupling may unwittingly spur China to become more economically and technologically self-sufficient.¹⁰³

Despite—or because of—the raging AI arms race, there is currently a global leadership vacuum to counter attempts by China, and other authoritarian regimes, to dominate the AI technological space and international debate. Although the US consistently sounds the alarm bells around China's AI aspirations and the EU urges international efforts against AI that violates fundamental rights, increasingly noting China's actions with concern,¹⁰⁴ little concrete international action has taken place. Both sides have prioritized efforts and investment in AI to prevent a global order dominated by values that oppose their respective interests. However, US and EU efforts are inherently more decentralized therefore potentially less effectively implemented, particularly due to their efforts to innovate while respecting the rule of law and ethics. The absence of US or EU leadership is a stark departure

99 Harry Broadman, "Forced US-China Decoupling Poses Large Threats," *Forbes*, September 30, 2019, <https://www.forbes.com/sites/harrybroadman/2019/09/30/forced-u-s-china-decoupling-poses-large-threats/#b6828a6598e9>.

100 Natalie Sherman, "Is China Gaining an Edge in Artificial Intelligence?," *BBC*, November 12, 2019, <https://www.bbc.com/news/business-50255191>.

101 Sherman.

102 Paul Tucker, "US Reliance on China Is a 'Hard Problem' for AI Efforts, Commission Says," *Defense One*, November 5, 2019, <https://www.defenseone.com/technology/2019/11/us-reliance-chinese-students-workers-hard-problem-say-ai-commission-leaders/161082/>; "Interim Report."

103 Kavita Chandran and Ana Nicolaci da Costa, "China's Drive to Be a World Leader in Technology Could Accelerate as Its Economy Slows," *CNBC*, November 22, 2019, <https://www.cnbc.com/2019/11/22/china-drive-to-be-world-tech-leader-could-accelerate-as-its-economy-slows.html>; Harry Broadman, "Forced US-China Decoupling Poses Large Threats," *Forbes*, September 30, 2019, <https://www.forbes.com/sites/harrybroadman/2019/09/30/forced-u-s-china-decoupling-poses-large-threats/#b6828a6598e9>.

104 The EC's *Communication: Artificial Intelligence for Europe (2018)* only explicitly mentions China's investment capacity in AI as a concern. However, the EC's High-Level Expert Group on AI's (AI HLEG) *Policy and Investment Recommendations for Trustworthy* (2019) report underlined the risks generated by "identifying and tracking individuals with AI," "covert AI systems," and "AI enabled citizen scoring in violation of fundamental rights," which underpins China's social credit system.

from global leadership trends since the end of the Cold War. Chinese efforts can be countered, but the US and the EU must join forces in AI to, among other things, prevent the global spread of the surveillance state.

Advancing AI Founded on Shared Values

The US and EU should collaborate to ensure their shared values set AI norms that ripple throughout the global AI ecosystem. Although ethics is mentioned as a potential source of divergence, we believe, as do Nand Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center (JAIC) and Ryan Budish, Assistant Research Director at the Berkman Klein Center for Internet and Society at Harvard University, that US and EU policymakers, academics, and industry experts are fundamentally aligned on ethical priorities and the importance of privacy, human rights and the rule of law.¹⁰⁵

AI ethical principles and draft regulatory guidelines published by the European Commission, US Office of Management and Budget, and US Department of Defense all recognize the need for: AI systems to protect human rights and privacy; algorithms to be fair, transparent, safe, secure, and governable; and policymakers and AI developers to be responsible and accountable to the technologies (See Figure 2 below for an overview of common language found in US and EU policy documents). Furthermore, according to Acting Director Mulchandani and Andrea Renda, Head of Global Governance, Regulation, Innovation and the Digital Economy at the Centre for European Policy Studies, US policymakers have recognized the importance of an ethical, human-centered approach to AI for their European counterparts and endeavored to communicate alignment on AI principles.¹⁰⁶

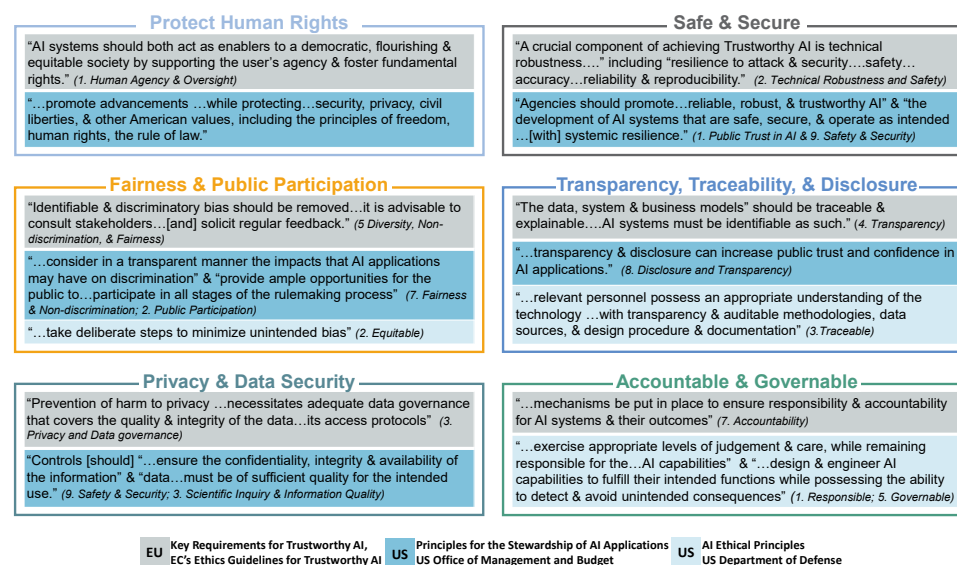
Differences could manifest in the implementation and operationalization of these values, but these discrepancies can be mitigated. The EU

105 Ryan Budish, Assistant Research Director at the Berkman Klein Center for Internet & Society at Harvard University, April 29, 2020; Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

106 Andrea Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies, April 30, 2020; Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

has positioned itself as a leader in trustworthy and human-centric AI¹⁰⁷ while the US¹⁰⁸ highlights the need for AI innovation to protect American values, civil liberties, and privacy.

Figure 2: US-EU Alignment on AI Principles



The EU's General Data Protection Regulation (GDPR) has set the international standard for data privacy regulation. The California Consumer Privacy Act, illustrates the knock-on effects of the EU's actions on global norms and regulatory spaces.¹⁰⁹ The interconnectivity of the US, EU, and Chinese markets intensifies the importance to lead in developing standards, norms, and regulation of AI. The US and the EU should capitalize on their areas of agreement and their first-mover advantage by coordinating their efforts on normative principles and guidelines.

107 High level expert group on AI, "POLICY AND INVESTMENT RECOMMENDATIONS FOR TRUST-WORTHY AI"; European Commission, "Building Trust in Human-Centric Artificial Intelligence."

108 Through documents such as the Executive Order on Maintaining American Leadership in AI, National AI R&D Strategic Plan, and various Executive Branch speeches.

109 Kristine Berzina, "Enhancing Transatlantic Cooperation on AI" (Center for Data Innovation, July 3, 2019), <https://itif.org/events/2019/07/03/enhancing-transatlantic-cooperation-ai>.

The Current State

In this section, we provide an overview of the ongoing AI developments in the United States and the European Union, as well as a summary of current US-EU collaboration on AI. We pay particular attention to the US and EU's respective AI strategies, bureaucratic and organizational changes to coordinate and implement their strategies, public sector funding, approach to regulation, and challenges particular to the realization of their AI goals. In the transatlantic AI cooperation section, we dispel the myth that the US and EU are doing nothing to coordinate their AI research, norms, innovation, and goals. Ultimately, we recommend the US and the EU should be doing more to advance a shared AI vision, but it is important to first understand the current developments and cooperation that can be built upon.

United States

In 2016, the United States' federal government started in earnest to develop a national approach to AI.¹¹⁰ Six months before its end, the outgoing Obama administration published the first [National AI Research and Development \(R&D\) Strategic Plan](#) as well as reports about the [future of AI](#) and the impact of [AI-driven automation on the economy](#).¹¹¹ In this first roadmap, the Obama administration identified key challenges that today's United States' federal government still grapples with: directing AI R&D funding strategically, growing the AI workforce, safeguarding US commercial interests, developing regulation without stifling innovation, utilizing AI to make the public sector more efficient, and reclaiming the AI R&D global leadership position from China, which had already surpassed the US in several research output metrics by 2016.¹¹²

The Trump administration built on this momentum and declared America's leadership in AI innovation and application as a national priority. The White House delegated resources for convening, assessing, and governing further AI innovation related to stated priority areas: AI for

110 Agrawal, Gans, and Goldfarb, "The Obama Administration's Roadmap for AI Policy."

111 Agrawal, Gans, and Goldfarb.

112 Agrawal, Gans, and Goldfarb.

American Innovation, AI for American Industry, AI for the American Worker, and AI with American Values. Recognizing the need for a “whole-of-government” approach to compete with countries like China that have highly centralized AI national strategies,¹¹³ President Trump established the American AI Initiative in the February 2019 Executive Order on [Maintaining American Leadership in Artificial Intelligence](#). The American AI Initiative, driven by the desire to protect America’s economy, national security, and AI assets, has six strategic objectives (see Figure 3 below for a summary of the strategic objectives).

Figure 3. American AI Initiative’s Six Strategic Objectives.



The executive order tasked the Select Committee on Artificial Intelligence, which was established in 2018 to advise the White House on federal AI R&D priorities and developments, with coordinating the American AI Initiative across the federal government.¹¹⁴ See the *Federal Governance of*

113 Jim Baker, “President Trump’s Executive Order on Artificial Intelligence,” *Lawfare*, February 28, 2019, <https://www.lawfareblog.com/president-trumps-executive-order-artificial-intelligence>.

114 Select Committee on Artificial Intelligence of the National Science & Technology Council, “The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update”; “Executive Order 13859: Maintaining American Leadership in Artificial Intelligence” (Executive Office of the President, February 11, 2019).

AI Efforts chart¹¹⁵ for details on the federal subgroups established in 2016 and 2018 to coordinate the national strategy.

Government Funding

The American AI Initiative also requires the Networking & Information Technology Research & Development Program (NITRD), which coordinates advanced activities across 24 Federal agency members and 45 participating agencies, to include in its annual Supplement to the President's Budget a breakdown of non-defense AI R&D spending.¹¹⁶ This requirement enables the federal government to more accurately assess AI-related R&D and ensure Departments and Agencies are executing on the guidance to prioritize AI R&D.

Figure 4 shows the requested FY 2020 budget for R&D primarily classified as AI R&D (direct AI R&D) and research that, although focused on another research area, has AI aspects (secondary AI R&D). Overall, direct AI R&D totaled \$654.4 million (12% of the total NITRD FY2020 budget request), and secondary AI research comprised an additional \$319.1 million.

Although these numbers seem large in absolute terms, there was not a significant growth in AI R&D¹¹⁷ from 2018 to 2020.¹¹⁸ The below figure does not include the funding requested by the Department of Defense or Defense Advanced Research Projects (DARPA),¹¹⁹ but there are estimates

115 The White House Office of Science and Technology Policy, "Summary of the 2018 White House Summit on Artificial Intelligence For American Industry," May 10, 2018; "Executive Order 13859: Maintaining American Leadership in Artificial Intelligence," February 11, 2019; The White House Office of Science and Technology Policy, "Update from the National Science and Technology Council Select Committee on Artificial Intelligence," November 30, 2018, <https://www.whitehouse.gov/wp-content/uploads/2018/12/2018.11.30-AI-Select-Committee-Update-Report.pdf>; Select Committee on Artificial Intelligence of the National Science & Technology Council, "The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update."

116 Subcommittee on Networking & Information Technology Research & Development Committee on Science & Technology Enterprise of the National Science & Technology Council, "The Networking & Information Technology Research and Development Program: Supplement to the President's FY 2020 Budget," September 2019.

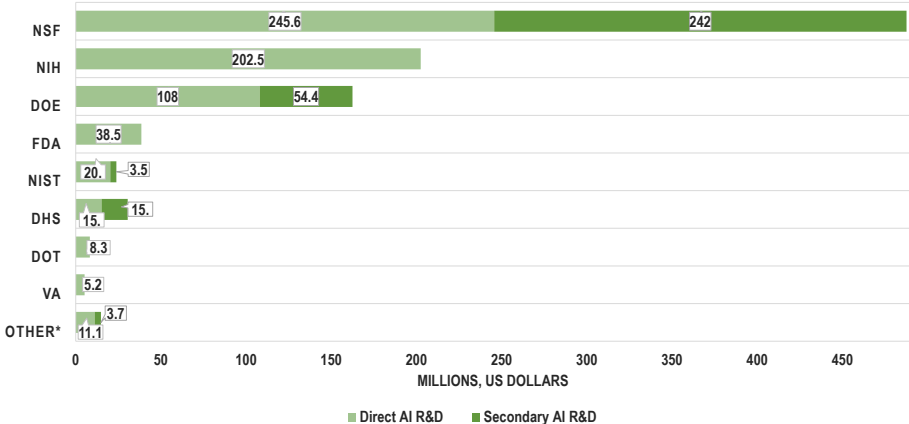
117 The total "direct" non-defense AI R&D was \$560.3 million in FY2018 and \$644.2 million in FY2019.

118 Subcommittee on Networking & Information Technology Research & Development Committee on Science & Technology Enterprise of the National Science & Technology Council, "The Networking & Information Technology Research and Development Program: Supplement to the President's FY 2020 Budget" (Executive Office of the President of the United States, September 2019).

119 Those numbers are classified.

that the DoD spent around \$4 billion in AI and ML-related R&D during FY2020, with about \$209 million going to the Joint Artificial Intelligence Center (JAIC).¹²⁰ Therefore, the total federal spending on AI-related R&D during FY2020 could be estimated at around \$5 billion.

Figure 4. FY2020 Budget Request for AI R&D



Source: The Networking & Information Technology Research & Development Program Supplement to the President's FY2020 Budget, September 2019
 Note: "Other" includes National Aeronautics and Space Administration, Department of Justice, Department of the Interior, Department of Agriculture, and the National Oceanic and Atmospheric Administration; Totals may not sum due to rounding.

120 Amrita Khalid, "The White House Wants More AI Research for Less Money," *Quartz*, February 14, 2020, <https://qz.com/1803033/the-white-house-wants-more-ai-research-for-less-money/>.

FEDERAL GOVERNANCE OF US AI EFFORTS

The **National Science and Technology Council (NSTC)**, as part of the Executive Branch, coordinates science and technology policy and research across the US federal government, ensuring the efforts are consistent with the President's objectives. It is co-chaired by the President and the Director of the Office of Science and Technology Policy at the White House, Kelvin Droegemeier.¹²¹

The **Select Committee on Artificial Intelligence** was created in 2018 to advise the White House on: interagency AI R&D priorities, establishing structures for planning and coordinating efforts, forming government partnerships with industry and academia, growing the national AI workforce, and utilizing data and computing resources to support R&D. It is comprised of senior officials from across the interagency and currently co-chaired by Michael Kratsios, Deputy Assistant to the President for Technology Policy in the Office of Science and Technology Policy (OSTP); France Córdova, Director of the National Science Foundation (NSF); and Steven Walker, Director of the Defense Advanced Research Projects Agency (DARPA). The Select Committee is tasked with coordinating the American AI Initiative.¹²²

The **Machine Learning and AI (MLAI) Subcommittee**, created in 2016, operates under the NSTC's Committee on Technology and is the main subgroup responsible for implementing and operationalizing tasks assigned by the Select Committee across AI research, education, outreach, standards, and related topics. It updates the National AI R&D Strategy Plan. It is currently co-chaired by Lynne Parker, Assistant Director for AI at OSTP; James Kurose, Assistant Director at the Directorate for Computer Information Science and Engineering (CISE) at the NSF; Charles Romine, Director of Information Technology Laboratory at NIST; and Stephen Binkley, Deputy Director of Science Programs at the Office of Science at the DOE.¹²³

The **AI R&D Interagency Working Group**, which operates under the NITRD Subcommittee, reports to the MLAI Subcommittee. The AI R&D IWG helps coordinate the interagency AI R&D efforts and reports the federal government's R&D spending in the NITRD Subcommittee's annual Supplement to the President's Budget. It is comprised of research program managers and technical experts and is currently co-chaired by Jeff Alstott, Program Manager at Intelligence Advanced Research Projects Activity (IARPA) Office of the Director of National Intelligence (ODNI), and Henry Kautz, Division Director of CISE Division of Information and Intelligent Systems at NSF.¹²⁴

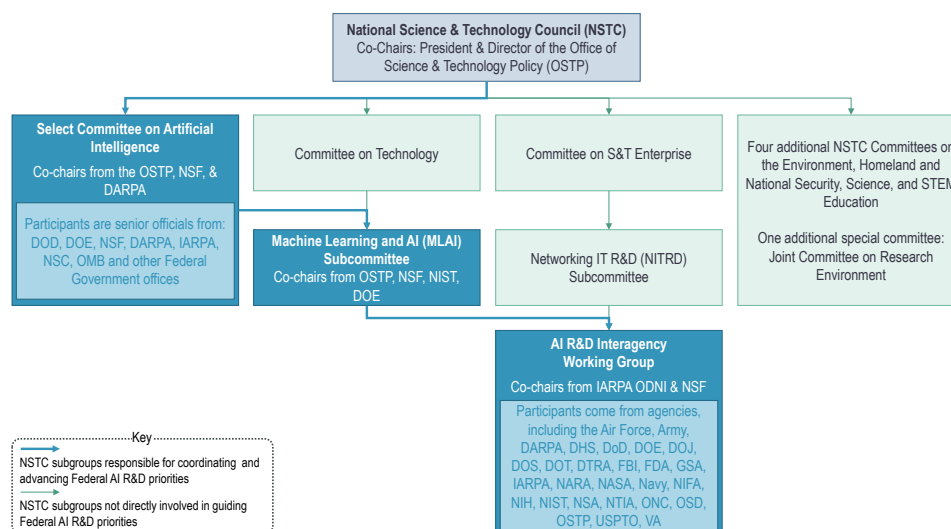
121 "Office of Science and Technology Policy: NSTC" (U.S. White House, n.d.), <https://www.whitehouse.gov/ostp/nstc/>; Select Committee on Artificial Intelligence of the National Science & Technology Council, "The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update."

122 Ibid.

123 Ibid.

124 "Office of Science and Technology Policy: NSTC"; Select Committee on Artificial Intelligence of the National Science & Technology Council, "The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update"; "Executive Order 13859: Maintaining American Leadership in Artificial Intelligence," February 11, 2019.

Figure 5: US Executive Branch Coordination of AI



Notably, for the upcoming FY 2021, President Trump significantly increased the funding request for AI R&D again. The Administration requested an increase in the budget for DARPA, the research arm of the Defense Department, of \$50 million to a total of \$459 million and an increase in JAIC’s budget from \$242 million to \$290 million.¹²⁵

The Trump administration has also committed to a minimum of doubling the non-defense government spending on AI by 2022.¹²⁶ In line with this promise, the administration requested a 70 percent increase in the National Science Foundation’s (NSF) AI R&D budget from \$500 million to close to \$850 million.¹²⁷ With this funding, the NSF—in partnership with the Departments of Agriculture, Homeland Security, Transportation, and Veterans Affairs—will create “National AI Research Institutes” that bring together academia, industry, Federal agencies, and nonprofits to conduct research on foundational AI and machine learning, trustworthy AI, and AI

125 “President Trump’s FY 2021 Budget Commits to Double Investments in Key Industries of the Future.”

126 Ibid.

127 “17. Research and Development, FY 2021 Budget Request” (Executive Office of the President, n.d.), https://www.whitehouse.gov/wp-content/uploads/2020/02/ap_17_research_fy21.pdf.

applications^{128, 129} Separately, the NSF will delegate \$50 million to train AI experts.¹³⁰ In addition, the FY2021 request includes an additional \$54 million for the Department of Energy and \$100 million for the Department of Agriculture.¹³¹

The National AI R&D Strategic Plan, updated in 2019, highlights the federal government's eight¹³² AI funding priorities.¹³³ Table 1 provides an overview of 17 federal agencies' current projects across these eight priorities.¹³⁴

128 The AI applications include physics, agriculture, molecular synthesis, and education.

129 "National Artificial Intelligence (AI) Research Institutes: Accelerating Research, Transforming Society, and Growing the American Workforce" (National Science Foundation, n.d.), <https://www.nsf.gov/pubs/2020/nsf20503/nsf20503.htm>; "17. Research and Development, FY 2021 Budget Request."

130 Cade Metz, "White House Earmarks New Money for A.I. and Quantum Computing," *The New York Times*, February 10, 2020, <https://www.nytimes.com/2020/02/10/technology/white-house-earmarks-new-money-for-ai-and-quantum-computing.html>.

131 "President Trump's FY 2021 Budget Commits to Double Investments in Key Industries of the Future."

132 The first seven were created in the 2016 and the eighth was added in 2019.

133 Select Committee on Artificial Intelligence of the National Science & Technology Council, "The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update."

134 Artificial Intelligence Research & Development Interagency Working Group, Subcommittee on Networking & Information Technology Research & Development, Subcommittee on Machine Learning & Artificial Intelligence, and the Select Committee on Artificial Intelligence of the National Science & Technology Council, "2016-2019 Progress Report: Advancing Artificial Intelligence R&D," November 2019, <https://www.whitehouse.gov/wp-content/uploads/2019/11/AI-Research-and-Development-Progress-Report-2016-2019.pdf>.

Table 1. AI R&D Projects and Investments by Federal Entities across National AI Strategic R&D Priorities, as of November 2019

Eight AI R&D Funding Priorities	Defense & Intel Agencies			Non-Defense Agencies													
	DoD ¹	DARPA	IARPA	NSF	NIH	DOE	HHS & FDA	NIST ²	DHS	DOT	VA	NASA	FBI & NIJ ³	NIFA ⁴	NOAA ²	Census & NTIA ²	GSA
1 Long-term investments in AI research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
2 Develop effective methods for human-AI collaboration	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓		
3 Understand & address ethical, legal, & societal AI implications	✓	✓		✓	✓	✓			✓	✓				✓		✓	
4 Ensure safety & security of AI systems	✓	✓	✓	✓		✓	✓	✓				✓			✓		
5 Develop shared public datasets & environments for AI training & testing	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓
6 Measure & evaluate AI tech through benchmarks & standards	✓	✓	✓		✓	✓	✓	✓	✓				✓		✓		
7 Better understand national AI R&D workforce needs	✓		✓	✓		✓		✓					✓	✓	✓	✓	
8 Expand public-private partnerships in AI	✓	✓		✓	✓	✓	✓	✓	✓				✓	✓	✓		

Source: Adapted from 2016-2019 Progress Report: Advancing Artificial Intelligence R&D, Executive Office of the President of the United States, November 2019
 1. Includes projects for the Air Force Office of Scientific Research (AFOSR), Army Research Office and Army Research Laboratory, and Office of Naval Research (ONR).
 2. Reports to Department of Commerce, 3. Reports to Department of Justice, 4. Reports to U.S. Department of Agriculture.

The Select Committee on AI detailed how it envisions these strategic priorities impacting the entire national AI landscape, as demonstrated in the three levels of AI R&D¹³⁵ depicted in Figure 6.¹³⁶ The bottom-row, which includes the last six strategic funding priorities, are assessed as the foundations for most AI R&D and applications. Example projects include NSF’s research to protect AI systems from adversarial attacks that manipulate training data or algorithms (strategy four),¹³⁷ the Department of Transportation’s (DOT) public dataset of 5.4 million vehicle trips that can be accessed by researchers after completing an ethics training (strategy five), and the General Services Administration’s (GSA) research into acquiring cloud computing resources to house federally funded AI R&D and datasets (strategy five).¹³⁸ The middle row details research areas

135 The graph was taken from the 2019 National AI R&D Strategic Plan.

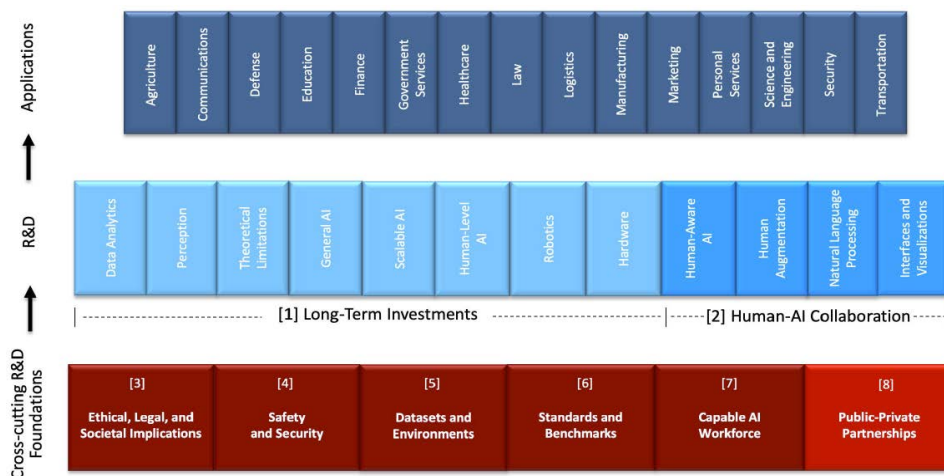
136 Select Committee on Artificial Intelligence of the National Science & Technology Council, “The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update” (Executive Office of the President of the United States, June 2019), <https://www.nitrd.gov/pubs/National-AI-RD-Strategy-2019.pdf>, p. 6.

137 Artificial Intelligence Research & Development Interagency Working Group, Subcommittee on Networking & Information Technology Research & Development, Subcommittee on Machine Learning & Artificial Intelligence, and the Select Committee on Artificial Intelligence of the National Science & Technology Council, “2016-2019 Progress Report: Advancing Artificial Intelligence R&D,” p. 21.

138 Select Committee on Artificial Intelligence of the National Science & Technology Council, “The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update,” June 2019, p 27.

considered by the Select Committee as necessary bridges between AI foundational research and AI applications detailed in the top row. Example projects that would be classified in the middle row include a joint NSF-DARPA project into developing high-performance, efficient hardware for machine learning (strategy one) and the National Oceanographic and Atmospheric Administration’s (NOAA) research into improving severe weather forecasting through human-AI collaboration.¹³⁹

Figure 6. Organization of the AI R&D Strategic Plan from the National AI R&D Strategic Plan, 2019 Update



Sources: National Artificial Intelligence Research and Development Strategic Plan: 2019 Update; graphic on page 6

AI Regulation and Principles

Although the US has made significant progress in detailing its research priorities and developing interagency groups responsible for coordinating research efforts, the US federal government still lacks a mature, overarching regulatory framework or governance structure to guide AI innovation and deployment. The US government’s approach, spearheaded by the Trump administration, has been to provide the minimal level of regulation necessary to appease industry’s desire for guidance while avoiding burdensome regulation that the Administration and industry fears would

¹³⁹ Select Committee on Artificial Intelligence of the National Science & Technology Council, p. 7 and 14.

limit innovation. In line with the American AI Initiative, the Office of Management and Budget (OMB) published its January 2020 draft memo with guidance intended to aid Federal agencies as they develop regulatory and non-regulatory oversight approaches to non-government applications of “weak”¹⁴⁰ AI.¹⁴¹ The memo highlighted the need “to avoid regulatory and non-regulatory actions that needlessly hamper AI innovation and growth.”¹⁴² It detailed ten principles to guide oversight (see Table 2 below).

Table 2: OMB’s “Principles for the Stewardship of AI Applications”

1	Public Trust in AI: Providing “reliable, robust, and trustworthy AI” to foster public trust in AI
2	Public Participation: Offering abundant opportunities for public participation in the government rulemaking process
3	Scientific Integrity & Information Quality: Leveraging high quality scientific and technical information throughout the rulemaking process and ensuring transparency around the strengths and weaknesses of the AI application ¹⁴³
4	Risk Assessment & Management: Utilizing a risk-based assessment and management process to determine regulatory and non-regulatory oversight
5	Benefits & Costs: Weighing the full social benefits and costs to the development and deployment of the AI application
6	Flexibility: Using “performance-based and flexible approaches” so that oversight can adapt to changes
7	Fairness & Non-Discrimination: Considering the AI application’s impact on fairness and non-discrimination
8	Disclosure & Transparency: Providing transparency and public disclosure information about an AI application
9	Safety & Security: Ensuring the AI systems are safe and secure, including maintaining the confidentiality, integrity, and availability of information utilized in the system
10	Interagency Coordination: Coordinating with the interagency to “ensure consistency and predictability of AI-related policies”

The memo urges departments and agencies to consider non-regulatory approaches to address risks posed by AI applications, including providing

140 “Weak” AI is defined in the memo as AI that “goes beyond advanced conventional computing to learn and perform domain-specific or specialized tasks by extracting information from data sets, or other structured or unstructured sources of information.” The memo stated that “strong” or “general” AI that exhibits sentience or consciousness was outside its scope.

141 Vought, “Memorandum for the Heads of Executive Departments and Agencies: Guidance for Regulation of Artificial Intelligence Applications.”

142 Russell T. Vought, “Memorandum for the Heads of Executive Departments and Agencies: Guidance for Regulation of Artificial Intelligence Applications” (Office of Management and Budget, January 13, 2020), <https://www.whitehouse.gov/wp-content/uploads/2020/01/Draft-OMB-Memo-on-Regulation-of-AI-1-7-19.pdf>, p. 2.

143 This principle also highlights the importance of high-quality data for training AI systems

exemptions from regulations, pursuing safe harbor pilot programs, increasing public access to government data, and developing voluntary consensus standards. Furthermore, Agencies should engage in international dialogues to promote consistent regulation while protecting American AI interests and democratic values.¹⁴⁴ Despite this progress, it is not clear how this policy will be executed as none of the guidance has become law.¹⁴⁵

Although not specific to AI, regulation around data governance impacts AI development and use. The US government, unlike the EU with GDPR, does not have an overarching data regulatory framework. Instead the US has a “patchwork” of data protection and privacy-related regulations across the federal and state levels.¹⁴⁶ Data legislation generally regulates data in certain sectors or industries,¹⁴⁷ bolsters the Constitution’s privacy protections, or prohibits private companies’ handling of personal data (e.g., the Federal Trade Commission Act prohibits “unfair or deceptive acts”).¹⁴⁸ The Health Insurance Portability and Accountability Act (HIPAA), which regulates the use of health-related data by specific entities, has come under particular scrutiny as AI is increasingly applied to the healthcare sector using data not covered by HIPAA.¹⁴⁹ Open legal questions about the development, use, and governance of health-related AI systems and technologies provide a preview of the re-examinations likely necessary to revise current and devise new legislation as AI and other data-driven technologies are developed.

There are no publicly available defense-related AI regulations, but the Department of Defense (DoD) published principles guiding AI design, development, and adoption in February 2020. The five principles (pictured in Figure 7) were determined after the DoD’s Defense Innovation

144 Vought.

145 The US federal departments and agencies are submitting proposed regulatory and non-regulatory guidance to the OMB for approval.

146 Stephen Mulligan, Wilson Freeman, and Chris Linebaugh, “Data Protection Law: An Overview” (Congressional Research Service, March 25, 2019), <https://fas.org/sgp/crs/misc/R45631.pdf>; Andy Green, “Complete Guide to Privacy Laws in the US” (Varonis, March 29, 2020), <https://www.varonis.com/blog/us-privacy-laws/>.

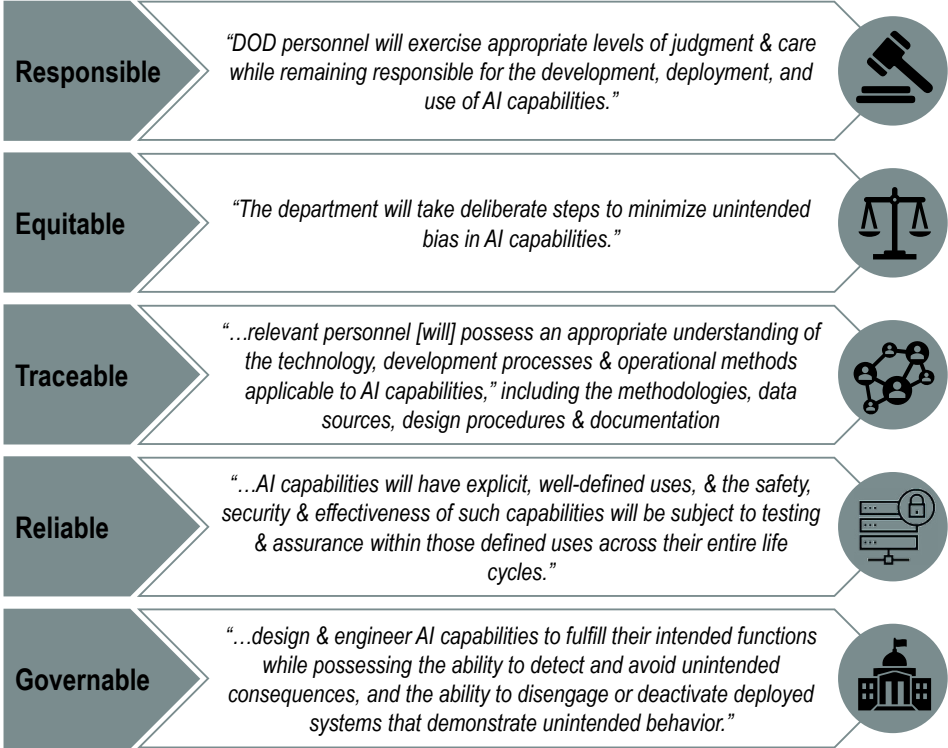
147 Some examples include: the Gramm-Leach-Bliley Act (GLBA)’s which applies to financial institutions, the Health Insurance Portability and Accountability Act (HIPAA), the Children’s Online Privacy Protection Act (COPPA), the Fair Credit Reporting Act (FCRA).

148 Mulligan, Freeman, and Linebaugh, “Data Protection Law: An Overview.”

149 Glenn Cohen, “AI In Healthcare: Legal and Ethical Issues” (Hype vs. Reality: The Role of AI in Global Health, Harvard Global Health Institute, February 26, 2019), <https://www.youtube.com/watch?v=oRuL6kzg7w0>.

Unit spent over 15 months conferring with AI and defense experts. At the announcement of these long awaited principles, Lt. Gen. Jack Shanahan, former Director of the Joint Artificial Intelligence Center (JAIC), explained these principles represented America’s “values of a free and open society,” bringing the US closer to becoming the first nation to successfully implement AI principles and, subsequently, lead AI globally.¹⁵⁰

Figure 7. DOD’s Five AI Principles



Source: C. Todd Lopez, "DOD Adopts 5 Principles of Artificial Intelligence Ethics," U.S. Department of Defense, February 25, 2020,

150 C. Todd Lopez, "DOD Adopts 5 Principles of Artificial Intelligence Ethics," US Department of Defense, February 25, 2020, <https://www.defense.gov/Explore/News/Article/Article/2094085/dod-adopts-5-principles-of-artificial-intelligence-ethics/>.

Challenges

Despite the momentum within the US federal government to prioritize AI and align efforts across the interagency to maintain America's AI leadership, there are three key challenges that imperil the ability of the US to achieve its strategic goals.

Private Sector Landscape: The US leads in many metrics of AI innovation. Notably, the US has the greatest number of AI-related startups and the largest amount of venture capital and private equity funding for AI.¹⁵¹ However, as already described in *The Case for Transatlantic Cooperation*, China's AI-related private industry and private funding, combined with government funding, a lack of regulation, and widespread economic espionage constitute threats to America's edge.¹⁵² The decentralized US approach, uncertainty across the US private sector on how to balance sometimes competing economic and ethical considerations, and the weak funding and information sharing links between government, academia, and industry could also hinder US efforts at AI leadership.¹⁵³

Workforce & AI Talent: As already mentioned, since 2016 the US government has recognized that it needs to build up its domestic workforce of AI talent as the demand exceeds the supply. According to Acting Director of the JAIC Nand Mulchandani, a significant amount of AI talent chooses to work in the private sector. As a result, the US Government's focus is on leveraging commercial AI offerings instead of only focusing on building internal AI talent.¹⁵⁴ Recognizing the growing lucrative nature of the private tech industry, students at American universities are increasingly demanding classwork focused on AI-related fields like computer science. However, universities are unable to match this demand with an appropriate expansion of tenure-track faculty in the same areas.¹⁵⁵ US immigration policy also threatens America's AI edge. Countries like Canada, the UK,

151 Castro, McLaughlin, and Chivot, "Who Is Winning the AI Race: China, the EU or the United States?"

152 Wm. C. Hannas and Huet-meei Chang, "China's Access to Foreign AI Technology" (Center for Security and Emerging Technology, September 2019), https://cset.georgetown.edu/wp-content/uploads/CSET_China_Access_To_Foreign_AI_Technology.pdf.

153 "Interim Report."

154 Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

155 "Generation CS: CS Undergraduate Enrollment Surge Since 2006" (Computing Research Association, 2017), <https://cra.org/data/Generation-CS/>; "Interim Report."

and China have reformed their visa processes to attract foreign talent focused on AI research.¹⁵⁶ The US may lose its attractiveness to foreign researchers and AI experts if it does not similarly ease immigration procedures including vis-à-vis China, whose nationals have historically been part of America's science and technology innovation workforce.¹⁵⁷

AI Funding: Although the Administration has pledged to increase (non-defense and defense) AI-related spending and absolute AI R&D budget numbers have increased, there are concerns that these numbers may not accurately reflect development. First, as AI-related expenditures have increased, the budget for all government R&D has decreased.¹⁵⁸ For example, the President's budget request for cuts in R&D at NSF, NIH, DOE, and other agencies, would force these government entities to prioritize AI R&D to the detriment of other, potentially equally useful R&D.¹⁵⁹ Second, without full transparency about the procedures undertaken to re-classify projects as AI-related, it is not possible to fully credit the supposed increase in AI-related R&D to new AI projects. One analysis by Bloomberg Government of the Pentagon's FY2020 budget found that approximately 27% of the legacy AI-related activities had not included any AI components or descriptors in the previous year budget.^{160,161} Observers have suggested that the DoD was partaking in "AI-washing," or exaggerating the increase in its AI-related R&D to meet government imposed objectives.¹⁶² The US government will need to be careful that initiatives to enhance AI innovation do not foster a zero-sum competition between AI and other S&T research but instead foster genuine innovation.

156 Stéphane Lambert, "Enhancing Transatlantic Cooperation on AI" (Center for Data Innovation, July 3, 2019), <https://itif.org/events/2019/07/03/enhancing-transatlantic-cooperation-ai>; Hu, "A Magnet for Overseas Talent, US Might Lose AI Race If Restrictive Immigration Policies Remain, Says Report"; "United Kingdom AI Strategy Report" (European Commission, n.d.), https://ec.europa.eu/knowledge4policy/ai-watch/united-kingdom-ai-strategy-report_en; Jade Leung, Sophie-Charlotte Fischer, and Allan Dafoe, "Export Controls in the Age of AI" (War on the Rocks, August 28, 2019), <https://warontherocks.com/2019/08/export-controls-in-the-age-of-ai/>.

157 Hu, "A Magnet for Overseas Talent, US Might Lose AI Race If Restrictive Immigration Policies Remain, Says Report."

158 Khalid, "The White House Wants More AI Research for Less Money."

159 Ibid.

160 Bloomberg Government analyzed all 346 AI-related activities in the FY2020 budget. 254 of these activities carried over from the previous year and 70 of those activities did not have AI-descriptors in the FY2019 budget request.

161 Chris Cornillie, "Finding Artificial Intelligence Money in the Fiscal 2020 Budget" (Bloomberg Government, March 28, 2019), <https://about.bgov.com/news/finding-artificial-intelligence-money-fiscal-2020-budget>.

162 Ibid.

Recognizing many of these issues at play, Congress established the National Security Commission on Artificial Intelligence (NSCAI) to spend several years reviewing America's AI landscape and make recommendations to protect America's national competitiveness and national security.¹⁶³ NSCAI is investigating America's AI R&D, defense applications, and talent and workforce, as well as America's AI-related technological and computing resources, international efforts to advance US interests, and position on the ethical considerations of AI.¹⁶⁴ NSCAI's final recommendations and report will be published in 2021. Although this commission is a positive step in addressing the obstacles the US may face in implementing the American AI Initiative, the US government must be sure not to ignore NSCAI's recommendations or other efforts necessary to address these challenges.

163 "Interim Report"; "National Security Commission on Artificial Intelligence Requests New Ideas; RAND Responds" (RAND Corporation, February 21, 2020), <https://www.rand.org/blog/2020/02/national-security-commission-on-artificial-intelligence.html>.

164 "Interim Report."

European Union

The first concerted effort to devise a holistic and comprehensive European political approach towards AI began in the mid-2010s, under the Juncker Commission (2014-2019) (see Figure 8). It was growing public and academic debate around the development and risks generated by AI and pressure from the European Council that spurred various European institutions¹⁶⁵ into action.¹⁶⁶ The EC's approach under Jean-Claude Juncker was to refrain from legislative actions while emphasizing self-regulation, particularly regarding AI ethics.¹⁶⁷ In contrast, and as Head of Global Governance, Regulation, Innovation and the Digital Economy at the Centre for European Policy Studies Andrea Renda underlined, the Von der Leyen Commission (established in November 2019) signaled a move towards stronger EU regulations concerning AI and data use,^{168, 169} with President Von der Leyen announcing that legislation for a coordinated European approach on the human and ethical implications of AI could be proposed in her first 100 days.¹⁷⁰

165 This include the European Commission, the European parliament, the European Council, the European economic and social council and the committee of the regions

166 Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem."

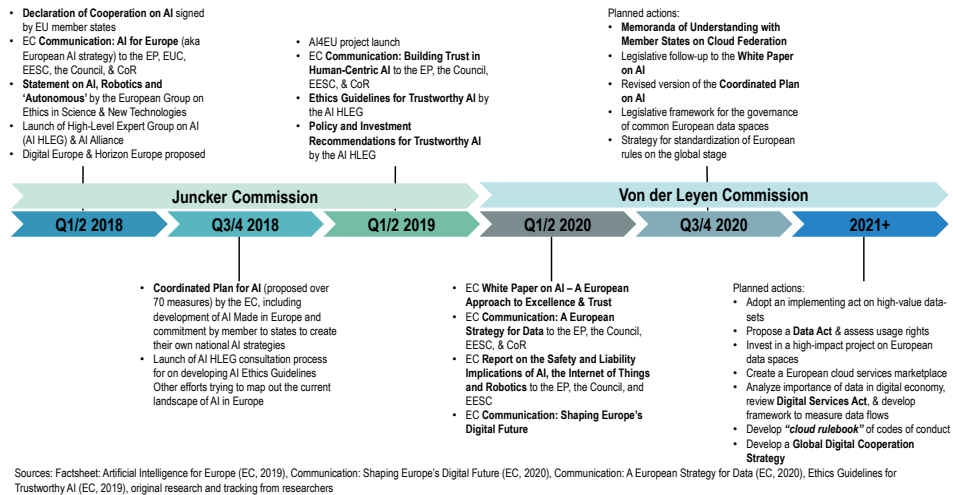
167 DODS, "AI Policy in the EU: An Overview" (DODS, April 2020), https://www.theparliamentmagazine.eu/more/latest-reports/download.view_169.htm.

168 Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies.

169 According to the EC, European Data spaces should entail the clarification and harmonization of data governance models and practices while setting up the necessary infrastructure to foster the exchange of quality and interoperable data in the respective sectors (e.g., public sector, health or banking sectors) European Commission, "Annex: All Reports of the Workshops on 'Common European Data Spaces,'" (European Commission, July to November 2019).

170 Ursula von der Leyen, "A Union That Strives for More: My Agenda for Europe," 2019, https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf; DODS, "AI Policy in the EU: An Overview" (DODS, April 2020), https://www.theparliamentmagazine.eu/more/latest-reports/download.view_169.htm.

Figure 8: Timeline of the EU’s AI Policy Development



The EU’s various AI policy actions—depicted in Figure 8—are driven by an emerging understanding and European discourse around AI. Europe, on the one hand, views AI as holding tremendous potential to help solve a wide array of societal challenges (e.g. healthcare, transportation, sustainability, e-governance, energy production) and, on the other hand, views AI as being a key enabler of economic and scientific growth.¹⁷¹ AI’s societal consequences, however will need to be addressed through a trustworthy¹⁷², human-centered, and values-based approach.¹⁷³ Accordingly, the EU has argued that to “make a difference - and be the champion of an approach to AI that benefits people and society as a whole,”¹⁷⁴ the EU must be the leader in “ethical AI”.

171 European Commission, “Artificial Intelligence for Europe” (European Commission, April 25, 2018).

172 See the part on the EU’s *Ethics Guidelines for Trustworthy AI*

173 M Craglia et al., “Artificial Intelligence A European Perspective” (Luxembourg: Joint Research Center - European Commission, 2018).

174 European Commission, “Artificial Intelligence for Europe” (European Commission, April 25, 2018), https://ec.europa.eu/transparency/regdoc/rep/1/2018/EN/COM-2018-237-F1-EN-MAIN-PART-1_PDF; Charlotte Stix, “A Survey of the European Union’s Artificial Intelligence Ecosystem” (European Commission, February 1, 2019), <https://doi.org/10.13140/RG.2.2.30791.65447>.

THE EU'S MAIN INSTITUTIONS INVOLVED IN AI POLICY

The **European Commission (EC)**, as the EU's executive body composed of 27 Members of the College of Commissioners, leads the EU's AI efforts. Key commissioners include the EC's Vice-President Margrethe Vestager, who heads 'Europe fit for the Digital Age,' and Thierry Breton, Commissioner for the Internal Market. Breton is responsible for the EU's digital single market strategy, Digital Education Action Plan, technological sovereignty (e.g., data, AI, 5G) efforts, and European defense efforts (e.g., European Defence Fund and Action Plan on Military Mobility).¹⁷⁵ Since the Juncker Commission (2014-2019), the EC has been one of the driving forces of AI policy in Europe. In accordance with the rest of the EU institutions, it has led the strategic conceptualization efforts through the publication of various AI-related strategic documents. It has encouraged Member States to develop their own AI strategies. Compared to its predecessor who emphasized some degree of self-regulation, the new von der Leyen Commission has instead taken a stand for stronger regulations on AI, and particularly against "high risk" AI.

The **Directorate General for Communications Networks, Content and Technology (DG CONNECT)** is the EC department responsible for the EU's digital single market strategy and for implementing the EU's digital transformation work. DGCONNECT is composed of 10 Directorates, including Directorate A. Artificial Intelligence and Digital Industry, Directorate F. Digital Single Market, and Directorate G. Data.¹⁷⁶ **Unit A.1 for Robotics and Artificial Intelligence** is chiefly responsible for the EC's work on AI, including managing AI-related R&D through various EU funding mechanisms like Horizon 2020.¹⁷⁷ Roberto Viola is the Director-General and Khalil Rouhana the Deputy Director-General, while Juha Heikkilä is the head of Unit A.1.¹⁷⁸ EVP Margrethe Vestager and Commissioner Thierry Breton are the commissioners responsible of DG CONNECT.¹⁷⁹

The **European Parliament (EP)**, is the EU's legislative body, is a proactive voice in favor of regulating AI, adopting a set of non-binding resolutions: the *2017 Civil Law Rules on Robotics*; the *2019 Comprehensive European Industrial Policy on AI and Robotics*; and the *2020 Automated decision-making process: Ensuring consumer*

175 "The Commissioners: The European Commission's Political Leadership" (European Commission, n.d.), https://ec.europa.eu/commission/commissioners/2019-2024_en; "Thierry Breton" (European Commission, n.d.), https://ec.europa.eu/commission/commissioners/2019-2024/breton_en.

176 "Artificial Intelligence" (European Commission, April 16, 2020), <https://ec.europa.eu/digital-single-market/en/artificial-intelligence>; "Strategic Plan 2016-2020: Directorate-General for Communications Networks, Content and Technology" (European Commission, https://ec.europa.eu/info/sites/info/files/strategic-plan-2020-dg-cnect_may2016_en.pdf 2016); "Communications Networks, Content and Technology" (European Commission, n.d.), https://ec.europa.eu/info/departments/communications-networks-content-and-technology_en#leadership; "Communications Networks, Content and Technology - Organisation Chart" (European Commission, July 1, 2020), https://ec.europa.eu/info/sites/info/files/organisation_charts/organisation-chart-dg-connect_en.pdf.

177 "Artificial Intelligence"; "Robotics and Artificial Intelligence (Unit A.1)" (European Commission, n.d.), <https://ec.europa.eu/digital-single-market/en/content/robotics-and-artificial-intelligence-unit-a1>.

178 "Communications Networks, Content and Technology"; "Communications Networks, Content and Technology - Organisation Chart."

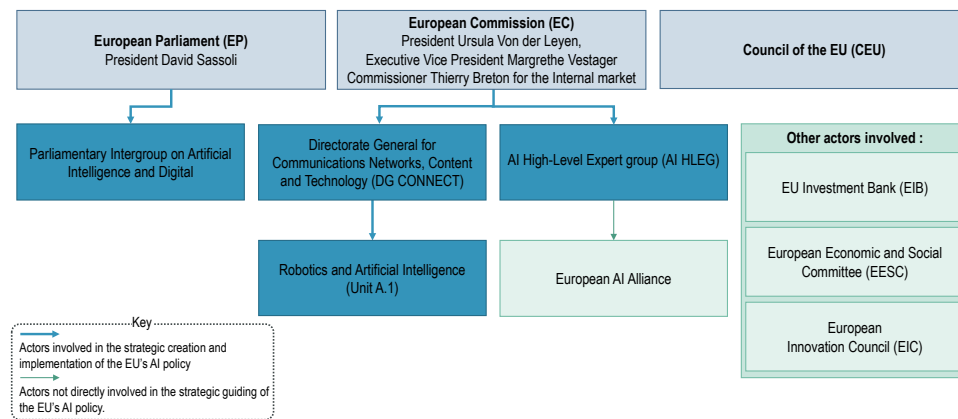
179 Ibid.

protection, and free movement of goods and services. A strong leitmotif amongst all these resolutions has been privacy, data protection, ethics, and respect of fundamental rights. Furthermore, last February, the EP created a **Parliamentary Intergroup on Artificial Intelligence and Digital**, which is charged with reviewing and spearheading the EP's efforts in regulating AI, notably around the upcoming debate around the revision of product liability rules.¹⁸⁰

The High-Level Expert Group on AI (AI HLEG), created in June 2018, supports the EU's AI strategy by advising the EC and steering the European AI Alliance. It is charged with helping to generate a broad and inclusive multi-stakeholder dialogue regarding AI policy. Furthermore, the EC tasked the AI HLEG with publishing the *Ethics Guidelines on Trustworthy Artificial Intelligence* and *Policy and Investment Recommendations for Trustworthy Artificial Intelligence*, which have both supported the EC's recent work and communications around AI. The AI HLEG is composed of 52 representatives¹⁸¹ from academia, civil society, and industry (including telecoms and big data companies).¹⁸²

The European AI Alliance is an online multi-stakeholder forum and discussion platform that seeks to enable broad and open discussion around the various aspects of AI policy, its development, and its impact. With over 4,000 participants from across civil society (e.g., consumer organizations, businesses, trade unions), the AI Alliance has provided input on AI HLEG's publications. The AI Alliance will have its second annual assembly in October 2020 to present its recommendations on the EC's *White Paper on Artificial Intelligence*.¹⁸³

Figure 9: EU Coordination on AI



180 Eurosmart, "THE EP INTERGROUP ON AI AND DIGITAL," Eurosmart, March 24, 2020, <https://www.eurosmart.com/the-ep-intergroup-on-ai-and-digital/>.

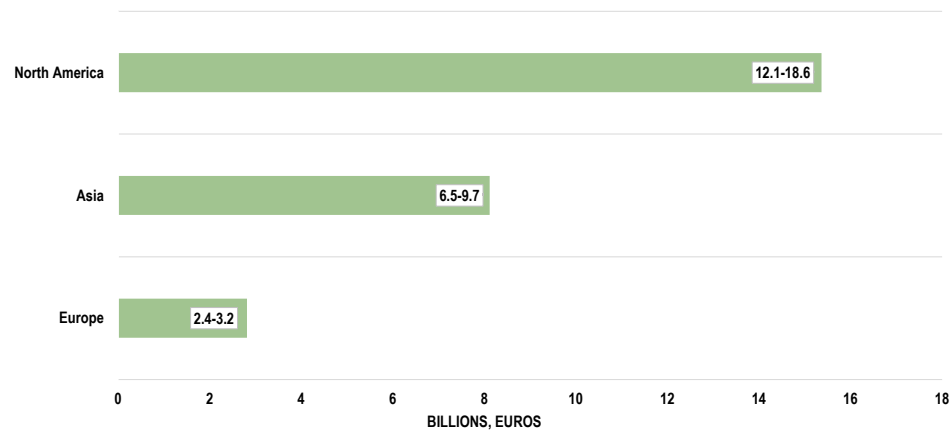
181 For a detailed list of experts, see <https://ec.europa.eu/digital-single-market/en/european-ai-alliance>

182 "High-Level Expert Group on Artificial Intelligence" (European Commission, July 9, 2020), <https://ec.europa.eu/digital-single-market/en/high-level-expert-group-artificial-intelligence>.

183 "The European AI Alliance" (European Commission, July 10, 2020), <https://ec.europa.eu/digital-single-market/en/european-ai-alliance>; Alex Moltzau, "What Is the European AI Alliance?," Medium, *Medium* (blog), December 27, 2019, <https://medium.com/@alexmoltzau/what-is-the-european-ai-alliance-9e435a1b1757>.

The second element to the European narrative underscores the extent to which the EU trails behind North America and Asia, particularly in the private sector. Specifically, Europe stresses it lags these two regions in its volume of investments (e.g., venture capital or funding for startups), strength of its AI industry (i.e., number of companies active in the field), innovative capacity (number of patents filed), ability to commercialize its research, and adoption of AI in the public and private sectors.¹⁸⁴ To put things in perspective, in 2016 private investments for AI amounted to approximately €2.4-3.2 (\$3-4) billion in Europe, as compared to €6.5-9.7 (\$8-\$12) billion in Asia and €12.1-18.6 (\$15-\$23) billion in North America.^{185 186}

Figure 10: Comparative Private Sector Investment in AI



Source: Communication: Artificial Intelligence for Europe (EC, 2018), 10 Imperatives for Europe in the Age of AI and Automation, (McKinsey, 2017)
 Note: The private sector investment estimates were given in ranges, but the bar chart was built off an average of the range (2.8 for Europe, 8.1 for Asia, and 15.35 for North America).

184 Fabien Merz, “Europe and the Global AI Race” (CSS Analyses in Security Policy, June 2019); Stix, “A Survey of the European Union’s Artificial Intelligence Ecosystem.”

185 Disclaimer: These figures appeared in the EC policy documents in Euros, but appeared in the McKinsey report (10 Imperatives for Europe in the Age of AI and Automation) in USD as: \$3-4 billion in Europe, \$8-12 billion in Asia, and \$15-23 billion in North America.

186 European Commission, “Artificial Intelligence for Europe,” April 25, 2018; McKinsey, “10 Imperatives for Europe in the Age of AI and Automation,” October 2, 2017, <https://www.mckinsey.com/featured-insights/europe/ten-imperatives-for-europe-in-the-age-of-ai-and-automation#>.

Thirdly, the EU has asserted that it can “lead the way in developing and using AI for good and for all.”¹⁸⁷ Despite the aforementioned weaknesses, Europe sees itself as having enough underlying structural strengths and soft power, particularly in values, to compete and re-affirm its technological sovereignty.¹⁸⁸ For instance, as Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz Thomas Metzinger skeptically noted, the EU’s rhetoric conveys a belief that it is a global competitor with the US and China.¹⁸⁹ This is illustrated by citations in the EC’s AI strategy about Europe’s strong academic and industrial record, world class researchers and universities, and advanced leading industries in transportation, healthcare, and manufacturing. The EC underscores that its digital single market—with harmonized rules, strong connectivity, and free flowing data—benefits companies as they can more easily develop across borders and invest in other Member States.¹⁹⁰ Finally, the EU emphasizes that Europe could unlock troves of industrial and public sector data for developing and training AI if the EU develops standards that guarantee privacy, security, and the interoperability of data.¹⁹¹

Three Pillars: Regulate, Govern, and Promote

The European institutions have devised a three-pillared approach, delineated in the April 2018 *EC Communication: Artificial Intelligence for Europe*, to regulate, govern, and promote AI. The three pillars include the promotion of research and industry, strengthening data access and governance, and a strong focus on regulatory and ethical frameworks.¹⁹² The EU aims to preserve its competitiveness while creating the necessary conditions to close the gap with the US and China, whether in terms of investments, industry structure, access to data or commercialization of

187 Andrea Renda, “Artificial Intelligence: Ethics, Governance, and Policy Challenges” (Brussels: Centre for European Policy Studies Task Force, February 2019).

188 Ibid.

189 Thomas Metzinger, Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz, April 14, 2020.

190 European Commission, “Artificial Intelligence for Europe,” April 25, 2018.

191 Ibid.

192 Merz, “Europe and the Global AI Race”; Stix, “A Survey of the European Union’s Artificial Intelligence Ecosystem.”

research.¹⁹³ This three-pronged approach (see Figure 11 on the following page) places a strong emphasis on respecting the existing regulatory framework such as the GDPR and ethical principles (e.g., transparency and accountability).¹⁹⁴ These three pillars have guided the EU's AI actions since 2018. Additionally, two official guiding documents have since followed this Communication.

The first was the negotiation and publication of a non-binding *Coordinated Plan on the Development of AI in Europe*.¹⁹⁵ This plan, devised in 2018 by the EC and adopted in 2019, lays out over 70 joint action items—as part of its goal of achieving “AI Made in Europe”—for more efficient cooperation between European Members States, Switzerland, Norway, and the EC.¹⁹⁶ It focuses on five key areas: facilitating strategic coordination, increasing AI and digital investment (particularly through partnerships), increasing availability of data, accelerating AI adoption, fostering AI-related talent, and ensuring trust in AI through strong ethics and regulation. Overall, these 70 joint action items detail many of the specific projects undertaken by the EU today to strengthen AI R&D, market update, data-sharing, innovation, norms and standards development, and international cooperation.¹⁹⁷

193 Ibid.

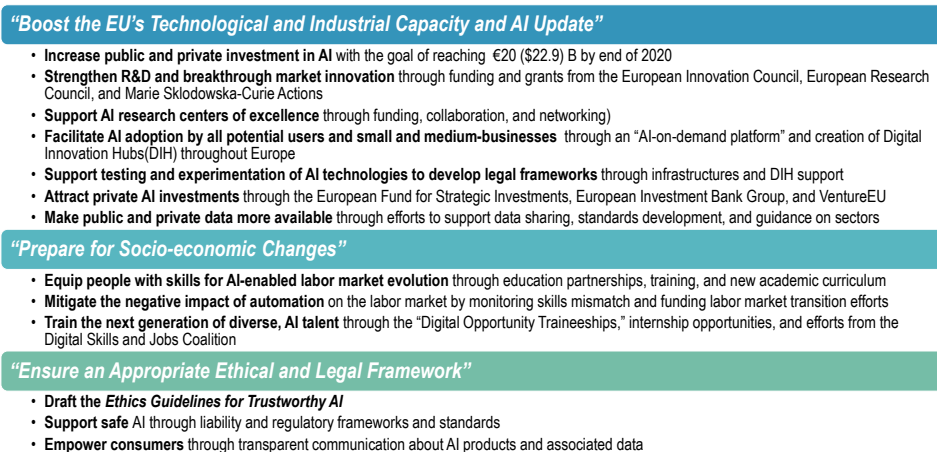
194 Fabien Merz, “Europe and the Global AI Race” (CSS Analyses in Security Policy, June 2019)

195 European Commission, “Coordinated Plan on Artificial Intelligence” (European Commission, December 7, 2018).

196 European Commission, “Coordinated Plan on Artificial Intelligence” (European Commission, July 12, 2018); “European Coordinated Plan on Artificial Intelligence” (European Council, Council of the European Union, February 18, 2019), <https://www.consilium.europa.eu/en/press/press-releases/2019/02/18/european-coordinated-plan-on-artificial-intelligence/>; DODS, “AI Policy in the EU: An Overview.”

197 DODS, “AI Policy in the EU: An Overview”; European Commission, “Coordinated Plan on Artificial Intelligence.”

Figure 11: The EU's Three-Pillared Approach to AI



Source: Approach summarized from the Communication: Artificial Intelligence for Europe (EC, April 2018)

The second direct outcome of the *Communication: Artificial Intelligence for Europe* was the drafting, consultation, and publication in April 2019 of the AI HLEG’s *Ethics Guidelines for Trustworthy AI*. Trustworthy and ethical AI has been an almost singular focus for the EC, as Europe views it as key to enable responsible competition.¹⁹⁸ The guidelines, which are currently voluntary, are based on the EU’s Charter of Fundamental Rights and account for principles like data protection and transparency. Accordingly, trustworthy AI has three underlying components detailed in the paper:

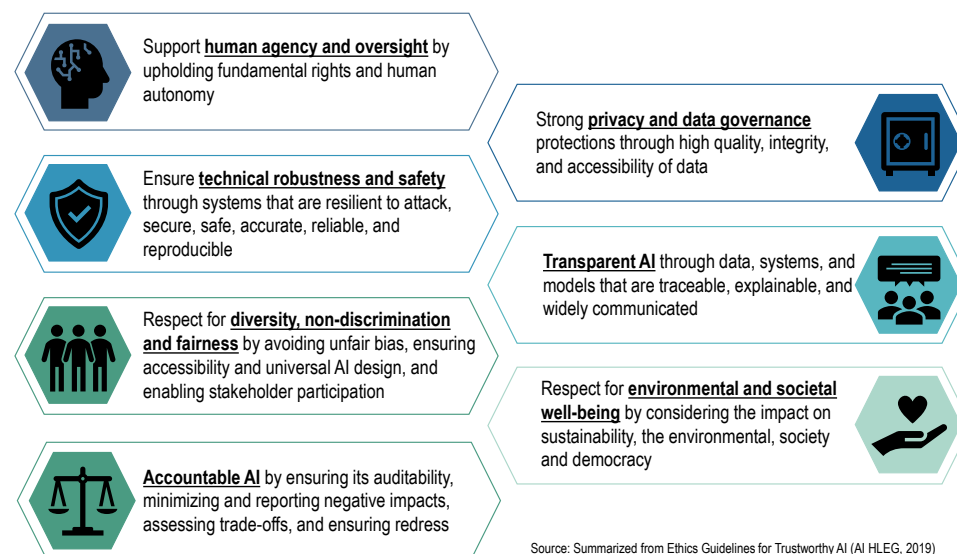
1. *Lawful*: AI should comply with all applicable laws and regulations (e.g., EU primary and secondary laws, UN human rights treaties, Council of Europe Conventions)
2. *Ethical*: AI should adhere to ethical principles and values (i.e., respect of human autonomy, prevention of harm, fairness, and explicability)
3. *Robust*: AI should be technically robust (e.g., resilient, accurate, reliable) and socially robust (e.g., no discrimination) so as to prevent unintentional harm.¹⁹⁹

198 European Commission, “Building Trust in Human-Centric Artificial Intelligence” (European Commission, August 4, 2019).

199 “Ethics Guidelines for Trustworthy AI,” Independent High-Level Expert Group on Artificial Intelligence (European Commission, April 8, 2019).

The *Ethics Guidelines* also detailed 7 “key requirements” for trustworthy AI (see Figure 12). After a first consultation phase, these guidelines and its “Trustworthy AI assessment list” were tested by various stakeholders and reaffirmed in the February 2019 *White Paper: On Artificial Intelligence—A European Approach to Excellence and Trust* (discussed in Current debate and regulations section below).

Figure 12: Ethical requirements for Trustworthy AI



The EU has started to develop various initiatives that reinforce collaboration and coordination across the European landscape, including Member States, the private sector, and academia. The following three initiatives are good examples of successful attempts at large scale collaboration.

The first of these initiatives, detailed in the *Coordinated Plan on the Development of AI in Europe* as well as other EU documentation, is the Digital Innovation Hubs (DIH) Network,²⁰⁰ which is part of the EU’s larger effort to digitize its industry and single market.²⁰¹ With a budget of €500

200 AI DIH, “Digital Innovation Hubs Network,” <https://d1dxeyimx6ufk.cloudfront.net/uploads/NA5/OD8012/AFED95E9.pdf>; DG Connect, “30 Digital Innovation Hubs Focused on Artificial Intelligence Selected for a Training Programme,” ec.europa, December 3, 2019, <https://ec.europa.eu/digital-single-market/en/news/30-digital-innovation-hubs-focused-artificial-intelligence-selected-training-programme>.

201 Stix, “A Survey of the European Union’s Artificial Intelligence Ecosystem.”

(\$572²⁰²) million under Horizon 2020 (H2020),²⁰³ the approximately 450 hubs²⁰⁴ act as points of contact and service providers that support, mentor, and coach small and medium enterprises (SMEs) and start-ups on business development, financing, and innovation management.²⁰⁵ While most of these do not focus specifically on AI, the EU, alongside PwC, Innovalia and CARSA, have selected 30 DIH²⁰⁶ to form an AI focused sub-network (AI DIH).²⁰⁷ The *Coordinated Plan* stated the EC would provide €100 (\$114.4) million for these AI DIHs.²⁰⁸ The European Network of AI Excellence Centers is a similar initiative launched in 2019 by the EC.²⁰⁹ These networks²¹⁰, which are funded at €50 (\$57) million under H2020, should help develop the EU's capacity by developing synergies, providing networking opportunities, and devising common AI research.²¹¹ As such, they are to be composed of leading figures in AI and industry.²¹²

The second is the AI4EU platform led by THALES²¹³ alongside 79 partners across Europe.²¹⁴ For the time period between 2018-2021, €20 (\$22.8) million has been set aside for this on-demand platform to provide expertise, tools, datasets and computing resources for all European scientists, entrepreneurs, SMEs, industries, and citizens that want to implement or develop

202 The researchers converted the Euros to US dollars for context throughout the section. The first currency is the currency provided in research and the currency in parentheses is a conversion.

203 Horizon 2020 is a 6-year long (2014-2020) research framework. It is policy instrument to implement and fund high-level policy initiatives of the European Union. Its estimated budget approximated EUR 80 billion.

204 These hubs are made up of various organizations such as universities, industry associations, accelerators.

205 Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem."

206 There was at least the 150 applicants (AI DIH)

207 AI DIH, "Digital Innovation Hubs Network"; Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem."

208 European Commission, "Coordinated Plan on Artificial Intelligence."

209 European Commission, "AI Excellence in Europe: €50 Million to Bring World-Class Researchers Together," European Commission, n.d., 07, <https://ec.europa.eu/digital-single-market/en/news/ai-excellence-europe-eu50-million-bring-world-class-researchers-together>.

210 The H2020 2018-2020 work program mentions "up to four networks"

211 IDEAL-IST, "EU Artificial Intelligence Excellence Centres," Ai-Excellence, May 28, 2019, <https://ai-excellence.b2match.io/>; European Commission, "Horizon 2020. Work Programme 2018-2020. Information and Communication Technologies," 2017, https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/h2020-leit-ict-2018-2020-05-27_draf_pre-publication.pdf.

212 Ibid.

213 A French multinational company that delve into aerospace, defense, and transportation

214 AI4EU, "The AIE4EU Observatory," AI4EU, n.d., <https://www.ai4eu.eu/about-project>; AI4EU, "Ethical Observatory Description of Functions, Oversight Powers, Specific Agenda and Interactions with Other Groups," August 21, 2019, https://www.ai4eu.eu/sites/default/files/inline-files/Deliverable_AI4EU_D5.1_M6_vf.pdf.

AI but lack sufficient expertise or resources to do so.²¹⁵ In addition, AI4EU has launched the European Observatory on Society and Artificial Intelligence (OSAI) that studies the ethical, legal, social, economic and cultural considerations of AI.²¹⁶

The third is AI Watch. This EC-led online knowledge service and platform monitors “industrial, technological and research capacity,” as well as, “policy initiatives in the Member States.” AI Watch also facilitates the implementation of Europe’s AI strategy by developing analyses and monitoring “the uptake and technical developments of AI and its impact on the economy, society and public services.”²¹⁷

Investment in AI

Despite lagging behind its North American and Asian counterparts, AI investment in Europe has recently increased. Between 2014 and 2017, investments for AI-related research (e.g., big data, health, rehabilitation, transport and space-oriented research) reached approximated €2.8 (\$3.2) billion.²¹⁸ Following the 2018 acknowledgement in the EC’s *Communication: Artificial Intelligence for Europe* of the risk this investment deficit places on Europe’s technological competitiveness, the EC announced the EU would substantially increase its funding of AI, specifically R&D, efforts. Accordingly, it increased its Horizon 2020 AI funding for the 2018 to 2020 period to €1.5 (\$1.7) billion.²¹⁹ These investments—for research, AI companies, and start-ups—are to be complemented by €500 (\$572) million from the European Fund for Strategic Investments (EFSI), €410 (\$469) million from VentureEU, €100 (\$114) million from the AI and Blockchain investment fund and €2.5 (\$2.8) billion from public-private partnerships (PPPs), totaling €4 (\$4.5) billion.²²⁰ These combined efforts constitute a

215 Stix, “A Survey of the European Union’s Artificial Intelligence Ecosystem.”

216 AI4EU, “The AIE4EU Observatory,” AI4EU, n.d., <https://www.ai4eu.eu/about-project>;

217 European Commission, “AI Watch,” European Commission, n.d., https://ec.europa.eu/knowledge-4policy/ai-watch_en#latest.

218 European Commission, “Artificial Intelligence for Europe,” April 25, 2018.

219 Ibid.; Stix, “A Survey of the European Union’s Artificial Intelligence Ecosystem.”; Digital Single Market, “Factsheet: Artificial Intelligence for Europe,” 2019.

220 Ibid; Fabien Merz, “Europe and the Global AI Race” (CSS Analyses in Security Policy, June 2019); European Commission, “Artificial Intelligence for Europe” (European Commission, April 25, 2018).

budget increase of 70% compared to the 2014 to 2017 period.²²¹ The EC's stated objective remains that total investments into AI research, development, and innovation—including from Member States, the private sector, and the EU—rise to €20 (\$22.8) billion per year over the next decade.²²²

The EC, in accordance with its co-legislators in the EP²²³ and the Council of the EU (CEU),²²⁴ has committed new funding under the next EU multiannual financial framework (2021-2027). Specifically, the EC has proposed to invest at least \$7.8 billion in AI for the Horizon Europe²²⁵,²²⁶ and Digital Europe research programs.²²⁷ AI research will likely also benefit from funding for cybersecurity (€2/\$2.3 billion), the development of digital skills (€700/\$800 million), the development of high performance computing infrastructure (€2.7/\$3 billion), and the promotion of digital technologies in the public sector (€1.2/\$1.4 billion).²²⁸

Current debate and regulations

Compared to the US's laissez-faire approach to AI, the EU is adopting a more regulatory one. Last January, the EC adopted its 2020 Work Program, which translated President Ursula von der Leyen's political guidelines into six policy ambitions (and concurring policy objectives). President von der

221 Ibid

222 Iglesias, Triaille, and Van Gysegem, "Legal and Regulatory Implication of Artificial Intelligence. The Case of Autonomous Vehicles, m-Health and Data Mining" (Luxembourg: European Commission, 2019).; European Commission, "Coordinated Plan on Artificial Intelligence" (European Commission, December 7, 2018).

223 Council of the European Union, "Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Establishing Horizon Europe—the Framework Programme for Research and Innovation, Laying down Its Rules for Participation and Dissemination," May 29, 2019, <https://data.consilium.europa.eu/doc/document/ST-8571-2019-INIT/en/pdf>.

224 Ibid.

225 Successor of Horizon 2020 that would run from 2021-2027, its budget ambition is around EUR 100 billion. It will focus on five main mission areas: climate change, cancer, smart cities, healthy ocean and soil and food health.

226 European Commission, "Horizon Europe - the next Research and Innovation Framework Programme," ec.europa, n.d., https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en.

227 European Commission, "Artificial Intelligence," European Commission, July 12, 2018, https://ec.europa.eu/commission/news/artificial-intelligence-2018-dec-07_en.

228 European Commission, "EUROPEAN COMMISSION DIGITAL STRATEGY A Digitally Transformed, User-Focused and Data-Driven Commission" (European Commission, November 21, 2018)..

Leyen's second ambition is to create "a Europe fit for the digital age".²²⁹ The aim is to make the EU "a digital leader across the board" where it "move[s] first on the future technologies with the most potential, while ensuring the European approach is human, ethical and values-based".²³⁰ At the same time, the EC published three related policy documents: *Shaping Europe's Digital Future*; the *White Paper on AI—An approach to Excellence and Trust*; and *A European Data Strategy*. All these documents put forth elements that will likely constitute the future regulatory framework for AI in Europe. According to the current calendar, the EC will propose different legislative follow-ups by the end of 2020.²³¹

The first communication, *Shaping Europe's Digital Future*, lays out a five-year roadmap to create a "European society powered by digital solutions that are strongly rooted in our common values."²³² "European technological sovereignty," is a core concept to ensure European needs are met and the European social model²³³ is upheld.²³⁴ The roadmap, guided by three overarching objectives presented in Figure 13,²³⁵ outlines the EU's technological sovereignty plans to increase European data and technological investments and decrease its reliance on non-European digital technologies and infrastructure.²³⁶ The aim is to develop and invest in

229 European Commission, "Commission Work Programme 2020: A Union That Strives for More" (European Commission, January 29, 2020), https://ec.europa.eu/info/sites/info/files/cwp-2020-publication_en.pdf; von der Leyen, "A Union That Strives for More: My Agenda for Europe."

230 DODS, "AI Policy in the EU: An Overview" (DODS, April 2020).; European Commission, "Commission Work Programme 2020 A Union That Strives for More" (European Commission, January 29, 2020).

231 "EU Proposal on Artificial Intelligence Regulation Released" (Gibson Dunn, February 26, 2020), <https://www.gibsondunn.com/eu-proposal-on-artificial-intelligence-regulation-released/>.

232 European Commission, "Shaping Europe's Digital Future" (European Commission, February 27, 2020).

233 The "European social model" a common vision that binds European states together. According to the EC's its values "include democracy and individual rights, free collective bargaining, the market economy, equal opportunities for all, and social protection and solidarity." The model is based on the conviction that economic progress and social progress are inseparable: 'Competitiveness and solidarity have both been taken into account in building a successful Europe for the future.' European Observatory of Working life, "European Social Model," *EurWorks* (blog), 2011, <https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/european-social-model>.

234 European Commission, "EUROPEAN COMMISSION DIGITAL STRATEGY A Digitally Transformed, User-Focused and Data-Driven Commission.;" European Commission, "Shaping Europe's Digital Future" (European Commission, 2020).; Peets, L. et al., "European Commission Presents Strategies for Data and AI (Part 1 of 4)," Covington, February 20, 2020, <https://www.insideprivacy.com/artificial-intelligence/european-commission-presents-strategies-for-data-and-ai-part-1-of-4/>

235 European Commission, "Shaping Europe's Digital Future" (European Commission, 2020).

236 European Commission, "Shaping Europe's Digital Future" (European Commission, February 27, 2020); Lisa Peets et al., "European Commission Presents Strategies for Data and AI (Part 1 of 4)," Covington, February 20, 2020, <https://www.insideprivacy.com/artificial-intelligence/european-commission-presents-strategies-for-data-and-ai-part-1-of-4/>.

innovation, connectivity, smart energy and transportation infrastructure, enhanced cybersecurity, quantum computing, and digital skills. It asserts a European approach via regulation, tech capabilities, and diplomacy.²³⁷ For example, the policy document calls for combatting over-concentration of market power through increased regulation and competition rules.²³⁸ Furthermore, it supports legislative measures to regulate online platforms, reinforcing user control over data and transparency during elections.²³⁹

Figure 13: Objectives of the EU’s Digital Roadmap

“Technology that works for people”	“A fair and competitive economy”	“An open, democratic and sustainable society”
“Technology that makes a real difference to people’s daily lives. A strong and competitive economy that masters and shapes technology in a way that respects European values”	“A frictionless single market, where companies of all sizes and in any sector can compete on equal terms...and consumers can be confident their rights are respected.”	“A European way to digital transformation which enhances our democratic values, respects our fundamental rights, and contributes to a sustainable, climate-neutral and resource-efficient economy.”

Note: Quotes taken from Shaping Europe’s Digital Future (EC, 2020)

The second communication, the *White Paper on AI*, lays out the EC’s AI priorities, which are to foster two parallel ecosystems, one of *Excellence* and another of *Trust*. To achieve an ecosystem of excellence, the *White Paper on AI* argues the EU will need to build capacity and develop and support “the uptake of AI across the EU economy and public administration”.²⁴⁰ As part of this goal, the white paper recommends, among other actions, to: set up new public-private partnerships (PPPs) in AI, data, and robotics; promote the adoption of AI by the public sector through an “adopt AI program”²⁴¹; facilitate the creation of AI excellence and testing centers; and “invest in educating and upskilling the workforce to develop AI skills”.²⁴²

237 European Commission, “EUROPEAN COMMISSION DIGITAL STRATEGY A Digitally Transformed, User-Focused and Data-Driven Commission.”; European Commission, “Shaping Europe’s Digital Future” (European Commission, 2020.); Peets et al., “European Commission Presents Strategies for Data and AI (Part 1 of 4).”

238 European Commission, “EUROPEAN COMMISSION DIGITAL STRATEGY A Digitally Transformed, User-Focused and Data-Driven Commission.”; European Commission, “Shaping Europe’s Digital Future” (European Commission, 2020.); Peets et al.

239 Peets et al.

240 European Commission, “White Paper on Artificial Intelligence - A European Approach to Excellence and Trust” (European Commission, February 19, 2020).

241 A program that helps the public sector to understand its needs and integrate AI solutions.

242 European Commission, “White Paper on Artificial Intelligence - A European Approach to Excellence and Trust” (European Commission, February 19, 2020.); Peets et al., “European Commission Presents Strategies for Data and AI (Part 1 of 4).”

For the ecosystem of trust, the white paper recommends addressing the ethical challenges and risks (e.g., breach of fundamental rights, privacy, discrimination) presented by AI that the existing EU legislative framework does not address. The white paper proposes a risk-based approach to regulating AI. At the plan's core is a mandatory conformity assessment requirement for "high-risk" AI applications, which are identified using two-criteria: an assessment of risks associated with the sector the AI is employed and the risks associated with the intended use of the AI application.²⁴³ Sectors mentioned that may carry significant risks are healthcare, transportation, energy, and some segments of the public sector. Applications of AI that may be considered "high-risk" are those that may carry significant adverse impacts on the rights of an individual or pose bodily or material damage (e.g., surveillance and facial recognition).²⁴⁴ "High-risk" AI systems should, the paper argues, be required to follow five features detailed in Figure 14 below.²⁴⁵ Although these are draft requirements, they seek to verify to what extent these AI applications could impact individuals' rights, security, and well-being. Conversely, the white paper proposes that AI applications that do not qualify as "high-risk" could be subject to a voluntary labelling scheme (i.e., meeting certain voluntary requirements could allow them to be labelled "ethical"). The EC hopes this label would become a high standard signal that would incentivize "low-risk" AI developers to implement these requirements.²⁴⁶

243 European Commission, "White Paper on Artificial Intelligence - A European Approach to Excellence and Trust" (European Commission, February 19, 2020).

244 Ibid.

245 Peets et al., "European Commission Presents Strategies for Data and AI (Part 1 of 4)."; European Commission, "White Paper on Artificial Intelligence - A European Approach to Excellence and Trust" (European Commission, February 19, 2020).

246 European Commission, "White Paper on Artificial Intelligence - A European Approach to Excellence and Trust."

Figure 14: Requirements for High-Risk AI Applications

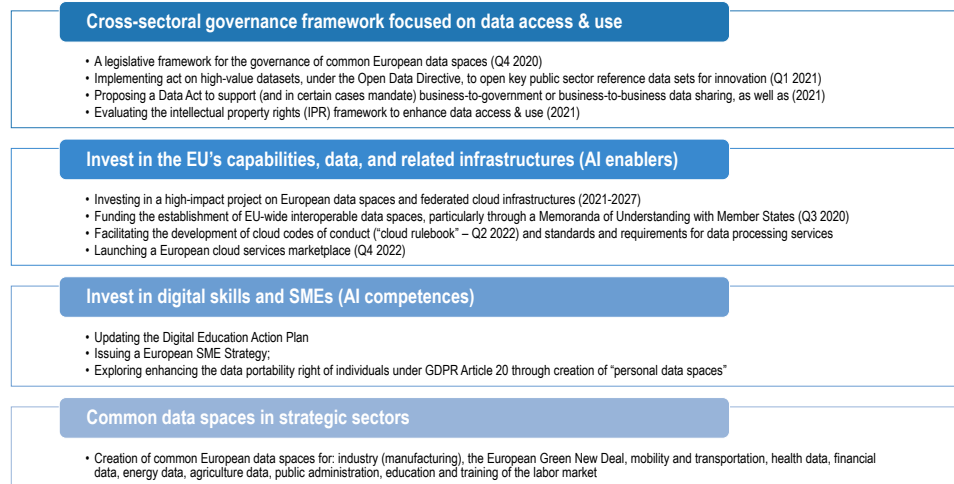
Training Data	<ul style="list-style-type: none">• Requirements that AI systems are trained on data sets that are 1) sufficiently broad to ensure safety and 2) representative to prevent discrimination• Requirements that privacy and personal data are protected and that GDPR and the Law Enforcement Directive are followed
Keeping of Records & Data	<ul style="list-style-type: none">• Requirements to keep accurate records of the data used to train and test AI systems; may need to keep the actual data sets• Documentation on the programming, training, testing, and validation of the systems to ensure safety and avoid bias
Information Provision	<ul style="list-style-type: none">• Requirements to provide notice to users when they are interacting with AI systems• Requirements to provide clear information about the AI system's capabilities, limitations, and expected accuracy
Robustness & Accuracy	<ul style="list-style-type: none">• Requirements to ensure that AI systems are robust and able to deal with errors/inconsistencies across their life cycle• Requirements that intended outcomes are reproducible• Requirements that systems are resilient against attacks to data and algorithms
Human Oversight	<ul style="list-style-type: none">• Requirements that the output of AI systems are only effective after human review and validation• Requirements that human monitoring, intervention, and deactivation of the system are possible in real-time and after the output becomes effective• Requirements that human intervention is necessary during certain conditions

Source: White Paper: On Artificial Intelligence – A European Approach to Excellence and Trust (EC, 2020)

The third communication, *A European Strategy for Data*, argues that for Europe to leverage the opportunities offered by AI, ensure its global competitiveness, and ascertain its technology and data sovereignty, it must “become a leading role model for a society empowered by data to make better decisions.”²⁴⁷ To do so the communication argues the EU must overcome various challenges like an imbalance of market power between large tech companies and SMEs, reliance on non-EU cloud providers, data interoperability issues, a lack of digital skills, and inherent cybersecurity risks. Another challenge is the availability of data; while GDPR introduces some restrictions on data usage, a lack of available data also stems from infrastructure challenges, less than full digitization, and the lack of a framework for sharing data. To address these, the EC proposes a four-pillared strategy including various legislative, European Commissioner-driven, and regulatory actions (see Figure 15 on the following page).

²⁴⁷ European Commission, “A European Strategy for Data” (European Commission, February 19, 2020).

Figure 15: Main Pillars of the EU's Data Strategy



Source: Communication: A European Strategy for Data (EC, 2020)

Challenges

Due to the socio-technical transformative power of AI, governing and harnessing its benefits is a complex affair. There are three fundamental issues the EU needs to overcome:

A fragmented market and landscape: This patchwork landscape results from the EU's political configuration of 27 different Member States, all of which have different levels of maturity and competitiveness with regard to its AI ecosystem. Some, like France or Germany, are major players in their own right, but the majority of EU Member States carry little weight on their own.²⁴⁸ This disparity in capability drives the EU to pool its resources together. The UK's decision to leave the EU constituted a serious blow to the EU's standing, as it deprived it of one of its most mature, rich and innovative AI environments.²⁴⁹ In addition, European AI assets (e.g., talent, education, expertise, research, start-ups, and capital) are highly fragmented and decentralized.²⁵⁰ As Professor of Theoretical Philosophy Thomas Metzinger pointed out, this makes effective coordination of all the different stakeholders complex but highly important. One example where

248 Axelle Lemaire et al., "Artificial Intelligence—A Strategy for European Startups Recommendations for Policymakers" (Germany: Roland Berger, Asgard Capital, n.d.).

249 Andrea Renda, "Artificial Intelligence: Ethics, Governance, and Policy Challenges" (Brussels: Centre for European Policy Studies Task Force, February 2019); Lemaire et al., "Artificial Intelligence—A Strategy for European Startups Recommendations for Policymakers."

250 Ibid.

coordination could be improved is research funding both within the existing EU research frameworks and between the EU government, academia, industry, and the Member States.²⁵¹

Europe is also fragmented along market and cultural lines. Indeed, compared to the US or China, the EU's AI market is not yet consolidated nor harmonized. In addition, some major sectors of the economy such as automotive, agriculture, energy, as well as the public sector, present varying degrees of AI maturity, penetration, and integration.²⁵² According to a McKinsey study,²⁵³ in 2017 only 25% of EU large enterprises and 10% of small and medium enterprises used big data analytics.²⁵⁴ This slow uptake of AI relates, in part, to the lack of trust of the general public and companies around issues of algorithmic transparency and biases. Meanwhile, the EU's AI governance must also be able to navigate and transcend potentially divisive differences that come from the cultural, historical, strategic, and institutional differences that characterize each and every Member State.²⁵⁵

Underlying structural factors impede its development and competitiveness: Europe lacks tech giants that characterize the US and Chinese tech landscape. As a result, European start-ups and tech companies compete against peers that have not only considerably larger investment capabilities, which enable them to acquire the latest technologies and companies, but also provide ample access to data and a greater ability to attract and retain a skilled workforce.²⁵⁶ The lack of easily available data, which impedes innovation, has emerged as a key issue for the EU and its private sector companies.²⁵⁷ These concerns are additionally fueled by the relatively more restrictive European privacy laws—and maybe soon mandatory ethical

251 Ibid.; Charlotte Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem" (European Commission, February 1, 2019), <https://doi.org/10.13140/RG.2.2.30791.65447>.

252 Lemaire et al., "Artificial Intelligence—A Strategy for European Startups Recommendations for Policymakers."

253 Jacques Bughin et al., "DIGITAL EUROPE: PUSHING THE FRONTIER, CAPTURING THE BENEFITS" (McKinsey & Company, 2016).

254 European Commission, "Artificial Intelligence for Europe" (European Commission, April 25, 2018).

255 Jennyfer Chrétien, "Artificial Intelligence, Building the European Way" (Renaissance numérique, October 2018).

256 Lemaire et al., "Artificial Intelligence—A Strategy for European Startups Recommendations for Policymakers."

257 Andrea Renda, "Artificial Intelligence: Ethics, Governance, and Policy Challenges" (Brussels: Centre for European Policy Studies Task Force, February 2019)

guidelines.²⁵⁸ “Brain drain,” meanwhile, poses a unique challenge to the EU as promising European researchers often choose to move to the US, Canada, or the UK for academic opportunities. Regarding the former for instance, 19% of Europe’s undergraduates move to the US to study, while 14% of European graduates move to the US to work. Overall, 11% of the US’s top tier AI workforce—which represent 59% of the global workforce—comes from Europe.²⁵⁹ In some cases, AI talent also moves to the US to work at larger international companies that acquire their start-ups.²⁶⁰ Examples include the French Moodstock (acquired by Google) and the UK’s Magic Pony Technology (acquired by Twitter).²⁶¹

A strong but slow regulatory process: While the policy process regarding AI has, under the impetus of the EC, accelerated over the last few years, the overall regulatory process cannot be as easily accelerated and might take years. According to the EC’s calendar (see Figure 8), the AI-related regulatory process will begin at the end of this year (2020), but the actual drafting and passage of the associated legislation is likely to take several years. As such, the EU runs the risk of not keeping up with the pace of technological evolution in AI as well as further politicization of regulation similar to the process of passing GDPR. Finally, as with most democracies, the EU will also face the challenge of operationalizing related regulations and principles, carefully and skillfully, balancing private and public sector interests throughout the process.

258 Ibid.

259 See: <https://macropolo.org/digital-projects/the-global-ai-talent-tracker/>

260 Andrea Renda, “Artificial Intelligence: Ethics, Governance, and Policy Challenges” (Brussels: Centre for European Policy Studies Task Force, February 2019); Stix, “A Survey of the European Union’s Artificial Intelligence Ecosystem.”

261 Stix.

Transatlantic Collaboration

Political collaboration

The transatlantic relationship has been fraught with tensions, mistrust, and stand-offs²⁶² preceding the current administration but exacerbated by aggravated rhetoric—like the speech from US Secretary of State Mike Pompeo at the 2020 Munich Security Conference²⁶³—and disagreements over trade, NATO defense spending, and the continuation of the Obama-era nuclear agreement with Iran.²⁶⁴ Both despite and because of this hostile climate, several calls for re-invigorating the special transatlantic alliance and cooperating on AI have been made. Indeed, former Director of the JAIC Lt. Gen. Shanahan recently concluded, “this discussion [on AI between the US, the EU and NATO] is beginning, but it is just the start of what I think will be years-long, close collaboration and cooperation between NATO and the European Union as we work together on, I think, one of the most important technologies that we’ve seen in a long time.”²⁶⁵

Both in the US and in the EU there seems to be political appetite for international collaboration on AI; however policymakers view specific US-EU cooperation with some degree of skepticism. At the European level for instance, the EU’s AI strategy underlines that addressing risks generated

262 Thomas Metzinger, Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz, April 14, 2020; Andrea Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies, April 30, 2020.

263 The Munich Security Conference (MSC) is the world’s largest high-level international security conference. Regular attendees include heads of states, ministers, international organizations, non-governmental organizations, members of Parliament and other legislative bodies, and representatives from civil society and the media. In the recent iterations, President Donald Trump, Vice President Mike Pence and Secretary of State Mike Pompeo have often criticized European nations (e.g., on defense spending or their approach towards China), further reinforcing and illustrating the rift between the two sides of the Atlantic.

264 Matthew Karnitschnig, “Trump Camp Finds No Appeasement at Munich,” *Politico*, February 16, 2020, <https://www.politico.com/news/2020/02/16/trump-munich-security-conference-115645>; Silvia Amaro, “A Trade War with Europe Would Be Larger and More Damaging than Washington’s Dispute with China” (CNBC, August 22, 2019), <https://www.cnn.com/2019/08/22/why-a-us-trade-war-with-europe-would-be-more-damaging-than-china.html>; David Herszenhorn, “Europe’s NATO Problem” (*Politico*, February 14, 2019), <https://www.politico.eu/article/europe-nato-problem-defense-procurement-training-research/>; Steven Erlanger, “Europe’s Gamble: Can It Save Iran Deal by Threatening to Kill It?” (*The New York Times*, January 15, 2020), <https://www.nytimes.com/2020/01/15/world/europe/europe-iran-nuclear-deal.html>.

265 Department of State, “Press Briefing with Air Force Lt. Gen. John Shanahan, Director of Joint Artificial Intelligence Center, US Department of Defense”; Brown, “Artificial Intelligence and the Transatlantic Alliance.”

by AI should be a global effort. Accordingly, the EC mentions “strengthening cooperation with like-minded partners such as Japan, Canada or Singapore,” particularly on ethical norms.²⁶⁶ The US, however, is not specifically mentioned. The US is instead depicted as a competitor with greater capacity, resources, and ability to attract skilled researchers and funding. At first blush, it seems the US has also failed to treat US-EU cooperation with the prioritization one would expect given the prominence placed in the American AI Initiative on international cooperation to achieve a global environment aligned with American values—values Europe largely shares.

While there might not be a formalized or politically endorsed US-EU collaboration on AI, both sides of the Atlantic participate in de facto AI collaboration in a number of multilateral fora, such as NATO, the OECD, the G20, and the G7. A key area of such collaboration—or at least alignment—is found in the negotiation and formalization of technical standards. Such collaboration mostly takes place in specialized institutions such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC)’s Joint Technical Committee on AI (ISO/IEC JTC 1, Information Technology Subcommittee 42, Artificial Intelligence).^{267, 268} Both American and European officials participate in the efforts of the JTC 1/SC 42. The American National Standards Institute (ANSI) is the secretariat of JTC1/SC42 and staff of both NIST and the DoD participate in the discussions.²⁶⁹

266 Kristine Berzina (Senior Fellow at Alliance for Securing Democracy at the German Marshall Fund during panel: Enhancing Transatlantic Cooperation on AI, Center for Data Innovation, July 3, 2019, <https://itif.org/events/2019/07/03/enhancing-transatlantic-cooperation-ai>; European Commission, “Artificial Intelligence: Commission Takes Forward Its Work on Ethics Guidelines,” April 8, 2019, https://ec.europa.eu/commission/presscorner/detail/en/IP_19_1893.

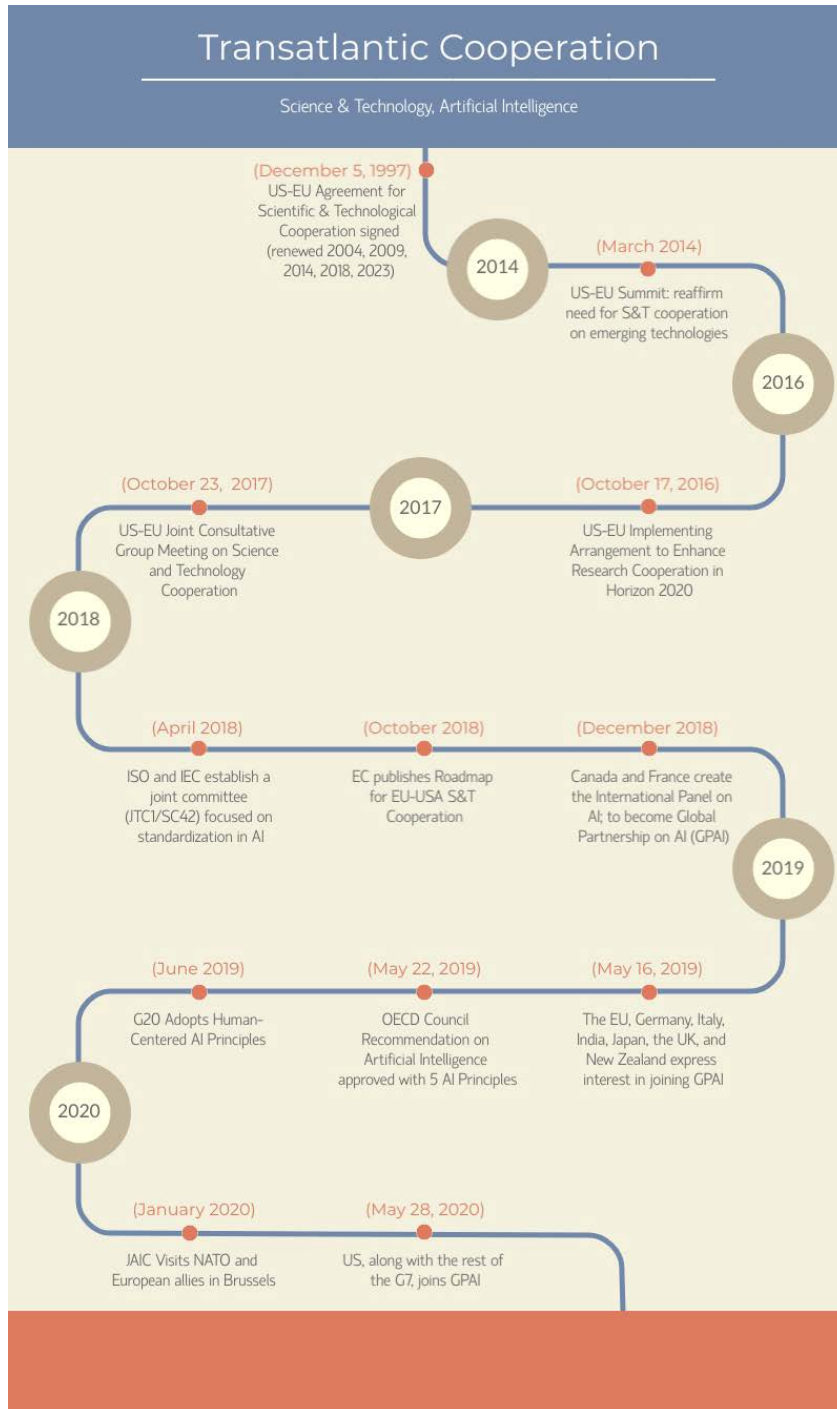
267 The goal of this committee is to bring diverse stakeholders (regulatory bodies, digital practitioners, data scientists) to develop, amongst other things, foundational standards (incl. a common taxonomy) to ensure trustworthiness by addressing common societal concerns from biases, to eavesdropping or safety.

268 Robert Bartram, “The New Frontier for Artificial Intelligence,” ISO, October 18, 2018, <https://www.iso.org/news/ref2336.html>; ISO/IEC JTC 001, “General Committee Documents,” [iso.org](https://isotc.iso.org/livelink/livelink?func=ll&objId=20085983&objAction=browse&viewType=1), n.d., <https://isotc.iso.org/livelink/livelink?func=ll&objId=20085983&objAction=browse&viewType=1>; [iso.org](https://isotc.iso.org/livelink/livelink?func=ll&objId=19384263&objAction=browse&viewType=1), n.d. <https://isotc.iso.org/livelink/livelink?func=ll&objId=19384263&objAction=browse&viewType=1>; [iso.org](https://isotc.iso.org/livelink/livelink?func=ll&objId=8913189&objAction=browse&viewType=1), n.d. <https://isotc.iso.org/livelink/livelink?func=ll&objId=8913189&objAction=browse&viewType=1>

269 Artificial Intelligence Research & Development Interagency Working Group, Subcommittee on Networking & Information Technology Research & Development, Subcommittee on Machine Learning & Artificial Intelligence, and the Select Committee on Artificial Intelligence of the National Science & Technology Council, “2016-2019 Progress Report: Advancing Artificial Intelligence R&D,” November 2019, <https://www.whitehouse.gov/wp-content/uploads/2019/11/AI-Research-and-Development-Progress-Report-2016-2019.pdf>.

Meanwhile, participation at the EU level is mostly made through its Member States' and national standards bodies.^{270, 271}

Figure 16: Timeline of Transatlantic S&T and AI Collaboration



270 In addition to the US participants, there are 30 participants, from countries like France, Austria, Belgium, Canada, China, Finland, Germany, India, the Democratic Republic of Congo, Ireland, Italy, Israel, Japan, Kenya, South Korea, Luxembourg, Norway, Russia, Saudi Arabia, Singapore, Spain, Sweden, Switzerland, UAE and the UK.

271 ISO, "ISO/IEC JTC 1/SC 42 Participation," [iso.org](https://www.iso.org/committee/6794475.html?view=participation), n.d., <https://www.iso.org/committee/6794475.html?view=participation>.

Another topic of de facto transatlantic collaboration and alignment is international principles for AI (i.e., norms for AI's development, use, and governance). In that regard and as confirmed by Assistant Research Director at the Berkman Klein Center Ryan Budish, a significant conduit of collaboration has been the OECD's *Values-based Principles for the Responsible Stewardship of Trustworthy AI*²⁷² which were adopted in May 2019 by 42 countries.²⁷³ These principles—supported by the US, the EU, and most European Member States—were developed by a group of international experts from member countries, think tanks, industry, and civil society. Amongst these were staff from the NSF, Departments of Commerce and State, as well as from the European Commission and various European Member States, such as the French, Dutch and German ministries of the economy.²⁷⁴ Indeed, during a speech at the 2019 White House Summit on AI, Deputy Chief Technology Officer Michael Kratsios stated that the US was working with “democracies of the world that share our common values,” as illustrated by the adoption of the OECD's AI principles.²⁷⁵ A more recent and promising example of and conduit for cooperation on responsible behavior is the newly founded Global Partnership for AI (GPAI). This initiative, which is grounded in the OECD AI principles was co-founded in June 2020 by the US and the EU.²⁷⁶ Its aims to develop AI “grounded in human rights, inclusion, diversity, innovation, and economic growth.”²⁷⁷ It is one of the most extensive collaborations on AI policy that exists, notably in terms of scale, diversity of experts and geographical span. As such, it is the first major coalition of likeminded states and is seen by many as an attempt to form a bulwark against China and its AI leadership ambitions. A last conduit

272 Colloquially referred to as the “OECD's Principles on AI” or just “OECD's AI principles”.

273 OECD, “What Are the OECD Principles on AI?,” OECD, 2019, <https://www.oecd.org/going-digital/ai/principles/>; Ryan Budish, Assistant Research Director at the Berkman Klein Center for Internet & Society at Harvard University, April 29, 2020.

274 OECD, “List of Participants in the OECD Expert Group on AI (AIGO),” n.d., <https://www.oecd.org/going-digital/ai/oecd-aigo-membership-list.pdf>.

275 “Summary of the 2019 White House Summit on Artificial Intelligence in Government” (The White House Office of Science and Technology Policy, September 9, 2019).

276 The initiative was born out of the Canadian and French G7 presidencies in 2018 and 2019. The other founders include, Australia, Canada, France, Germany, India, Italy, Japan, Mexico, New Zealand, the Republic of Korea, Singapore and Slovenia. The GPAI will initially be comprised of four working groups focused on responsible AI, data governance, the future of work, and innovation and commercialization.

277 Office for Artificial Intelligence, “Joint Statement from Founding Members of the Global Partnership on Artificial Intelligence,” GOV.UK, June 15, 2020, <https://www.gov.uk/government/publications/joint-statement-from-founding-members-of-the-global-partnership-on-artificial-intelligence/joint-statement-from-founding-members-of-the-global-partnership-on-artificial-intelligence>.

for international norms for AI has been the G20. In June 2019, the G20 drew upon the OECD's principles to publish its *Human-Centered AI Principles*.²⁷⁸

In recent months, Head of Global Governance, Regulation, Innovation and the Digital Economy at the Centre for European Policy Studies Andrea Renda pointed out that interests and political support for greater transatlantic coordination and collaboration on AI seems to be increasing. This is notably demonstrated by the visit in early 2020 of high-level officials on both sides of the Atlantic. The first, as already mentions in the Political collaboration section, was the visit in January from former Director of the JAIC Lt. Gen. Jack Shanahan and then CTO Nand Mulchandani to Brussels. During their visit to the NATO headquarters and with EU leaders, Lt. Gen. Shanahan underlined the need for greater collaboration for AI, particularly within NATO, in order to counter revisionist states such as China and Russia that promote digital authoritarianism. As Acting Director of the JAIC Nand Mulchandani mentioned, Lt. Gen. Shanahan also underscored the need for the US and Europe to rally around common values and not allow technicalities around ethics to block collaboration.²⁷⁹ The second high level visit was by a delegation from the *European Parliament's Civil Liberties Committee*, which visited Washington D.C and Boston in February 2020. The delegation held meetings with US Congressional members and representatives across the US Administration, including the DOS, DOJ, DHS, FTA, FBI, and PCLOB. The Members of the European Parliament (MEPs) also held meetings with representatives from industry, universities, think-tank, start-ups, and NGOs. The discussions centered on a variety of AI topics, ranging from potential future US federal legislation on personal data protection, the use of artificial intelligence in law enforcement, and the visa waiver program.²⁸⁰

The importance of transatlantic collaboration on AI—and more broadly on technology—is gaining traction with experts and researchers on both

278 G20, "G20 AI Principles," July 16, 2019, <https://www.g20-insights.org/wp-content/uploads/2019/07/G20-Japan-AI-Principles.pdf>.

279 Nand Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center, May 22, 2020.

280 Malone, "JAIC Director: Future of Defense AI Relies on Global Collaboration"; European Parliament Liaison Office in Washington DC, "EU-US Relations in Data Protection, AI and Security: MEPs Conclude Visit to US"; Department of State, "Press Briefing with Air Force Lt. Gen. John Shanahan, Director of Joint Artificial Intelligence Center, US Department of Defense."

sides of the Atlantic. Increasingly numbers of discussions and publications²⁸¹ focus on AI's impact on transatlantic relations.^{282, 283} Just as the Belfer Center for Science and International Affairs has recognized the importance to overcome tensions and fix the US-EU relationship for greater tech collaboration, research institutions like the Information Technology & Innovation Foundation's (ITIF) Center for Data Innovation, the Carnegie Endowment for International Peace, the European Union Institute for Security Studies (EU ISS), and Brookings have organized events and panel discussions stressing similar themes.²⁸⁴ A trend throughout the renewed research focus is that AI collaboration for defense within NATO often makes the top of the recommendations list.

Scientific collaboration

General Science and Technology Research

For more than 40 years, European and American researchers have collaborated on science and technology (S&T). The US has historically been the largest S&T R&D partner for many EU Member States as well as the largest partner for European research frameworks.²⁸⁵ After the EU and the US formalized their political relationship in 1990, US-EU S&T cooperation and dialogue only deepened. More recently both parties underscored, during the 2014 US-EU Summit's declaration, their commitment "to expand cooperation in research, innovation and new emerging technologies, and

281 Simona R. Soare, "Transatlantic Defence Cooperation on Artificial Intelligence" (European Union Institute for Security Studies, March 5, 2020), https://www.iss.europa.eu/sites/default/files/EU-ISSFiles/Brief%203%20AI_0.pdf; Brown, "Artificial Intelligence and the Transatlantic Alliance."

282 Other institution where transatlantic tech cooperation has been the topic of events include Stanford, the Hoover Institution, DefenseOne, and the Atlantic Council.

283 Kerry, Meltzer, and Engler, "The US and EU Should Base AI Regulations on Shared Democratic Values."

284 Eline Chivot et al., *How to Deepen Transatlantic Ties in AI and Cybersecurity*, 2020, <https://www.datainnovation.org/2020/04/how-to-deepen-transatlantic-ties-in-ai-and-cybersecurity/>; Michael Nelson et al., *Machine Learning and AI: A Transatlantic Conversation* (Washington DC: Carnegie Endowment for International Peace, 2020), <https://carnegieendowment.org/2020/01/21/machine-learning-and-ai-transatlantic-conversation-event-7250>; EU Institute for Security Studies, *The EU, Nato and Artificial Intelligence. New Possibilities for Cooperation*, 2019, <https://www.iss.europa.eu/content/eu-nato-and-artificial-intelligence-new-possibilities-cooperation>.

285 Wolfgang Wittke, "Enhancing Transatlantic Cooperation on AI" (Center for Data Innovation, July 3, 2019), <https://itif.org/events/2019/07/03/enhancing-transatlantic-cooperation-ai>.

protection of intellectual property rights as strong drivers for increased trade and future economic growth,” notably on the topics of the digital economy and cyber security.²⁸⁶

Currently, US-EU S&T cooperation takes place under the auspices of the Joint Consultative Group, the EU-US Space Dialogue, the Transatlantic Ocean Research Alliance, the Energy Council and the Transatlantic Economic Council.²⁸⁷ Meanwhile, it is the umbrella 1998 *Framework Agreement For Scientific and Technological Cooperation*²⁸⁸ (extended in 2004, 2009, 2014 and 2018) that set the frame for transatlantic S&T collaboration.²⁸⁹ More specifically, these agreements promote cooperation based on “mutual benefit, reciprocal opportunities to engage in cooperative activities, equitable and fair treatment,” and the “timely exchange of information.”²⁹⁰ Cooperative activities within these frameworks are diverse and range from coordinated research projects and joint task forces to joint studies, seminars, trainings or material and researcher exchanges.²⁹¹

These various collaborations are supported and promoted through a variety of arrangements and initiatives, such as BILAT 4.0, EURAXES or the European network of research and innovation centers and hubs (ENRICH). BILAT 4.0 was a coordination and support project developed by the EU to support US-EU policy dialogue on S&T cooperation while fostering joint research and innovation projects within the H2020 framework. BILAT 4.0’s activities included sharing information on funding opportunities with researchers and academic institutions, organizing best practice workshops and networking events, and assessing the progress of transatlantic S&T cooperation.²⁹² EURAXES and ENRICH, meanwhile,

286 European Parliament, “Scientific and Technological Cooperation between the EU and the United States,” eur-lex, n.d., <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGIS-SUM%3Ari0009>; “EU-US Summit: Joint Statement” (The White House: Office of the Press Secretary, March 26, 2014), <https://obamawhitehouse.archives.gov/the-press-office/2014/03/26/eu-us-summit-joint-statement>.

287 European Commission, “Roadmap for EU USA S&T Cooperation” (European Commission, 2017), https://ec.europa.eu/research/iscp/pdf/policy/us%20clean_roadmap_2017.pdf.

288 The Agreement was signed on December 5, 1997 but was ratified by the EU in October 1998.

289 European Parliament, “Scientific and Technological Cooperation between the EU and the United States.”

290 Ibid.

291 Ibid.

292 European Commission, “International Cooperation: USA,” n.d., <https://ec.europa.eu/research/iscp/index.cfm?amp;pg=usa>.

are respectively a networking website and a platform for S&T that facilitates the mobility²⁹³ and development of researchers, start-ups, and SMEs across the world, with an ENRICH hub specifically in the US.²⁹⁴

Another S&T supporting mechanism is a 2016 Implementing Arrangement²⁹⁵ signed by the then US Ambassador to the EU and the then European Commissioner for Research and Innovation. This agreement helped reconcile some funding obstacles between the US and the EU and reduce barriers for S&T collaboration between the two countries.²⁹⁶ For example, this agreement better enables US researchers and institutions to participate in Horizon 2020 because it removed the requirement to receive EU funding or sign the Horizon 2020 Grant Agreement, which had limited some researchers' participation because legal considerations precluded them from signing the grant agreements.²⁹⁷ Furthermore, the Implementing Arrangement stipulated that research partners must only follow bureaucratic and reporting rules for their own funding programs, helping to alleviate potential overly burdensome requirements.²⁹⁸

Horizon 2020²⁹⁹ is a good, albeit incomplete, indicator of the level of US-EU research collaboration. Despite challenges to integrate US entities more systematically into European research programs (see the Challenges to Collaboration & Recommendations section), the US remains the leading non-EU participant in Horizon 2020. According to CORDIS's

293 EURAXES provides, amongst other things, personal assistance, points of contact, visa assistance, information and tips on pensions, welfare, and the host country.

294 ENRICH has three centers around the world, including Brazil, China, and the US.

295 The full title is: *Implementing Arrangement Between the European Commission and the Government of the United States of America for Cooperation Between Researchers Funded Separately by the European Union's and the United States Framework Programs on Research and Innovation.*

296 "Signing of the U.S.-EU Science and Technology Agreement" (U.S. Department of State, December 5, 1997), https://1997-2001.state.gov/regions/eur/eu/971205_useu_js_sci_agr.html; US Mission to the European Union, "Press Release: U.S. and EU Sign Implementing Arrangement on Horizon 2020," US Mission to the European Union, October 17, 2016, <https://useu.usmission.gov/u-s-eu-sign-implementing-arrangement-horizon-2020/>.

297 US Mission to the European Union, "Press Release: US and EU Sign Implementing Arrangement on Horizon 2020."

298 "Implementing Arrangement Between the European Commission and the Government of the United States of America for Cooperation Between Researchers Funded Separately by the European Union's and the United States Framework Programmes on Research and Innovation," October 17, 2016, https://ec.europa.eu/research/iscp/pdf/policy/eu-usa_implementing_arrangement_2016.pdf; US Mission to the European Union, "Press Release: U.S. and EU Sign Implementing Arrangement on Horizon 2020."

299 As already mentioned, Horizon 2020 is a 6-year long (2014-2020) EU research framework. It is seen as a policy instrument to implement and fund high-level policy initiatives of the European Union. Its estimated budget is approximately EUR 80 billion.

dashboard³⁰⁰, between 2014-2020 American researchers received over \$94M³⁰¹ in European funding, most of which were individual grants (i.e., Marie Skłodowska-Curie actions^{302, 303}), followed by health, transportation, and research on information and communications technology (ICT).³⁰⁴ Meanwhile, approximately 1,278 grant agreements with US partners were signed and 1,669 American organizations were involved (see Figure 17 for the thematic breakdown) in over 60 Horizon 2020 projects. Most of these collaborations have been with institutions in the UK, Germany, Italy, Spain, and France (see Figure 18).

300 The Community Research and Development Information Service (CORDIS) is the EC's primary source of results from the projects funded by the EU's framework programs for research and innovation.

301 After deduction of their third-party funding.

302 Marie Skłodowska-Curie actions (MSCA) are grants provided to support researchers throughout their careers, develop training networks, and promote transnational, intersectoral, and interdisciplinary talent exchanges. MSCA seeks to "make the whole world a learning environment" through greater collaboration and five distinct actions: creating Innovative Training Networks (ITN) of universities, research institutes, and sectors; providing Individual Fellowships (IF) to researchers; supporting Research and Innovation Staff Exchange (RISE) between academia, industry, and organizations; providing Co-funding of regional, national and international programmes (COFUND) to support training and career development programs; and programming during the one-day European Researchers' Night (NIGHT). https://ec.europa.eu/research/mariecurieactions/msca-actions_en.

303 European Commission, "Marie Skłodowska-Curie Actions," ec.europa, n.d., <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-skłodowska-curie-actions>.

304 European Commission, "Roadmap for EU USA S&T Cooperation."

Figure 18: Thematic Priority of US participation in H2020 projects (2014-2020)³⁰⁵

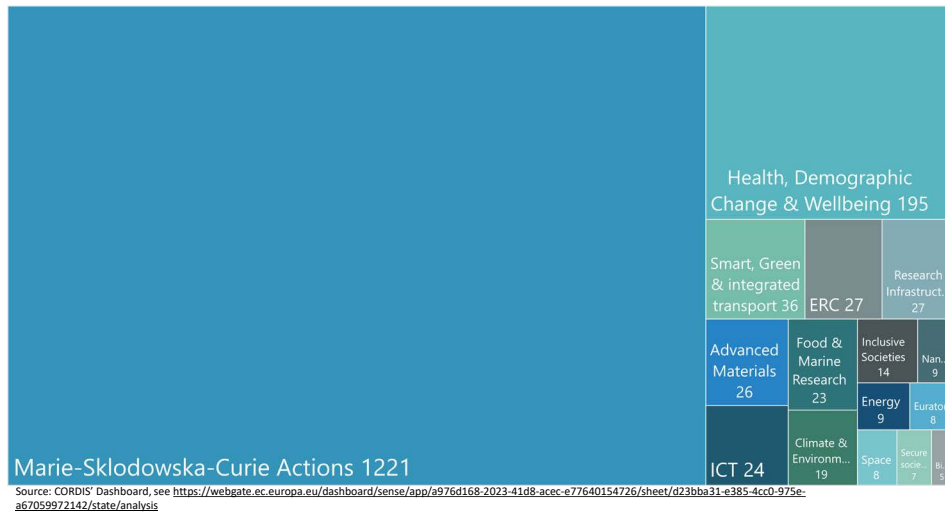
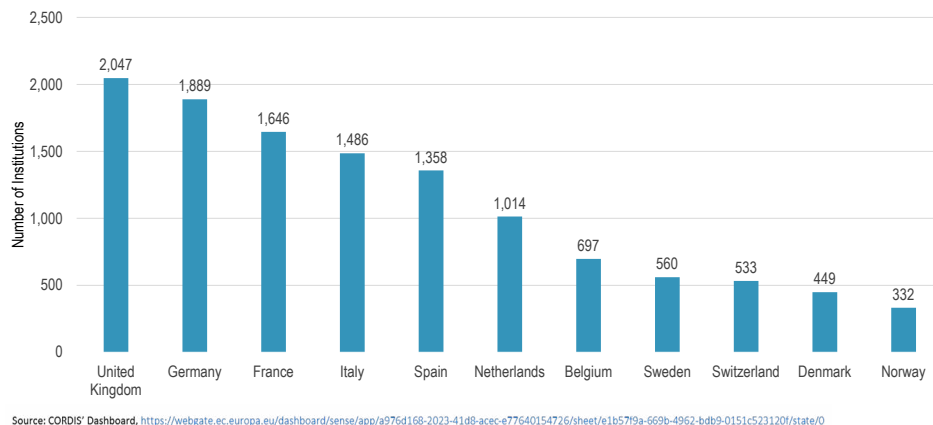


Figure 19: Geographic spread of institutions in H2020 projects with US Participation (2014-2020)³⁰⁶



305 This graphic was made using the filter “United States” in the “Participation in Programmes” tab of the Cordis dashboard. The sections are those of H2020’s program, namely: Marie-Sklodowska-Curie Actions; Health, demographic change and wellbeing; Smart, green and integrated transport; European Research Council (ERC); Research Infrastructures; Advanced materials; Information and Communication Technologies; Food security, sustainable agriculture and forestry; marine and maritime and inland water research and the bioeconomy; Climate action, environment, resource efficiency and raw materials; Europe in a changing world - inclusive, innovative and reflective Societies; Nanotechnologies; Secure, clean and efficient energy; Euratom; Space; Secure societies - Protecting freedom and security of Europe and its citizens; Biotechnology, Future and Emerging Technologies (FET); Integrate society in science and innovation; Advanced manufacturing and processing; Twinning of research institutions. For specific details about each see https://ec.europa.eu/programmes/horizon2020/h2020-sections_.

306 For clarity, collaborative links with other US institutions have been removed. This was made using the filter “United States” in the “Collaboration with other countries” tab.

AI-specific Research

Transatlantic collaboration for AI-related research is also taking place to a varying degree. However, we found that joint AI R&D is relatively ad hoc and materializes mostly³⁰⁷ within existing S&T research agreements and roadmaps. For instance, the *Roadmap for EU-USA Science & Technology Cooperation*³⁰⁸ delineates priority areas for transatlantic cooperation, namely health, transportation, bioeconomy, and marine and arctic research.³⁰⁹ While AI is not explicitly mentioned, these research areas can leverage AI technologies. In addition, the roadmap actively promotes funding institutions that leverage or develop AI, such as the European Organization for Nuclear Research (CERN).³¹⁰ CERN uses AI, machine learning, and data analytics within its Large Hadron Collider (LHC)³¹¹ accelerator project as well as within its CERN openlab,³¹² which delves into ethics for AI.³¹³

Compared to the overall US involvement in H2020, we found that US funding contributions and participation in AI-related H2020 projects is meager. For instance, US collaboration in H2020 projects can only be found in approximately 2% of AI-related projects, 12% of deep learning projects, and 4% of machine learning-related projects (see Figure 20).³¹⁴ These statistics indicate there is room for increasing the volume of US participation in AI-related projects and funding. With Horizon 2020 ending this year, such collaboration will need to take place within the upcoming “Horizon Europe” framework, which will replace Horizon 2020 and provide funding from 2021 to 2027.

307 As a caveat, this study does not take into account private sector R&D.

308 It was agreed by both the US and the EU within the framework of their joint committee and high-level dialogues in 2018. It was published by the European Commission.

309 European Commission, “Roadmap for EU USA S&T Cooperation.”

310 Ibid.

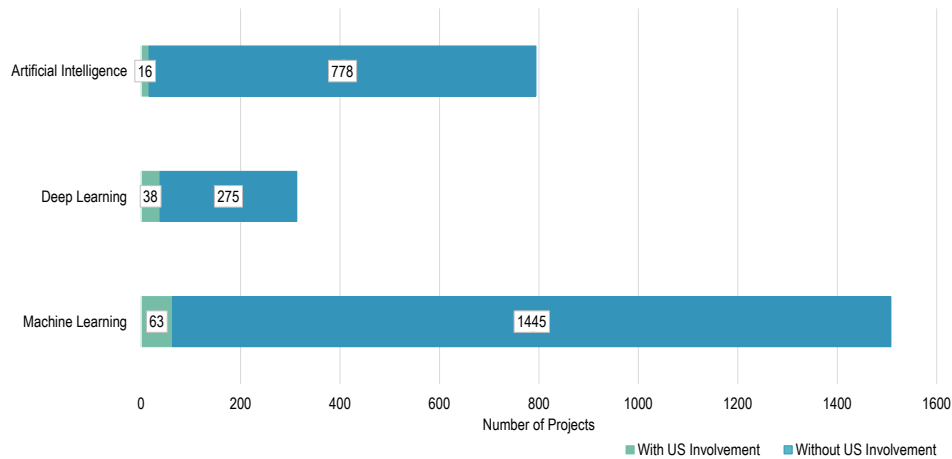
311 The LHC is the world’s largest and highest-energy particle collider and the largest machine in the world. It contributed to the discovery of the elementary particle Higgs Boson.

312 A PPP that helps develop technologies for the LHC project.

313 CERN openlab, “Our Work,” openlab, n.d., <https://openlab.cern/our-work>.

314 The comparative analysis was made using data from the CORDIS H2020 database. To get this number, the authors filtered for all projects that involved the US before filtering for the terms “artificial intelligence,” “deep learning,” and “machine learning” in their project description. Some search results were removed as they included the wording “AI” but were not directly focused on or leveraged AI technology.

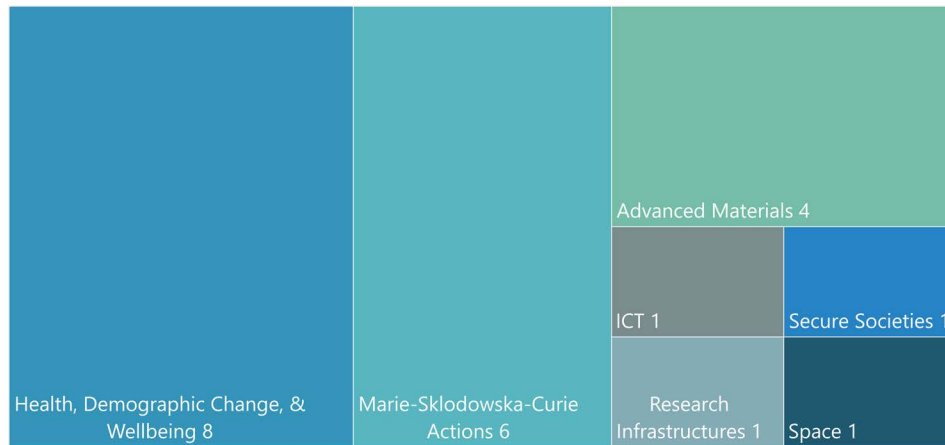
Figure 20: US Participation in AI-related H2020 Projects (2014-2020)



Source: CORDIS' Dataset, see [https://cordis.europa.eu/search/en?q=contenttype%3D%27project%27%20AND%20\(programme%2Fcode%3D%27H2020%27\)%20AND%20relatedRegion%2Fregion%2Fcode%3D%27US%27%20AND%20\(%27Artificial%27%20AND%20%27Intelligence%27\)%27&p=1&num=10&sr=%2Fproject%2FcontentUpdateDate,decreasing](https://cordis.europa.eu/search/en?q=contenttype%3D%27project%27%20AND%20(programme%2Fcode%3D%27H2020%27)%20AND%20relatedRegion%2Fregion%2Fcode%3D%27US%27%20AND%20(%27Artificial%27%20AND%20%27Intelligence%27)%27&p=1&num=10&sr=%2Fproject%2FcontentUpdateDate,decreasing)

An examination of the 16 projects³¹⁵ directly related to “Artificial Intelligence” shows that overall funding for these projects amounted to about \$160 million.³¹⁶ According to CORDIS’s dashboard, US researchers received over \$1 million³¹⁷ for the 2014 to 2020 period in European funding while US institutions contributed around \$1 million for these projects. The main thematic priority (see Figure 21) is Health.

Figure 21: Thematic Priority of US participation in AI-related H2020 projects (2014-2020)³¹⁸

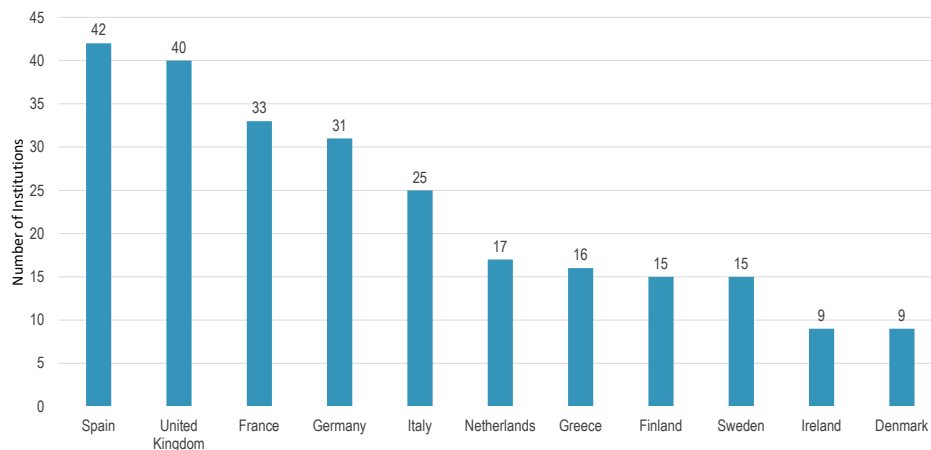


Source: CORDIS' Dashboard, see <https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acc0-e77640154726/sheet/d23bba31-e385-4cc0-975e-a67059972142/state/0>

- 315 A table with details and links to all 16 projects can be found in the appendix, all the data comes from the CORDIS database.
- 316 This was made using the filter “United States” in the “Collaboration with other countries” tab while filtering for the 16 identified AI-related projects.
- 317 After deduction of their third-party funding.
- 318 This was made using the filter “United States” in the “Participation in Programmes” tab while filtering for the 16 identified-AI related projects. The sections are from H2020. For details: <https://ec.europa.eu/programmes/horizon2020/h2020-sections>

In projects with US researchers, most of the European institutions that collaborated originated from Spain, the UK, France, and Germany (see Figure 22). The types of US organizations involved in these projects range across the private and public sector: 52% are research organizations or academic institutions like MIT, the University of California, and the Methodist Hospital Research Institute; 29% are private firms, such as Fujifilm, Philips, and Space Consulting; and 19% are non-profit organizations like the Bill & Melinda Gates Foundation or the Global Alliance for Tuberculosis Drug Development.

Figure 22: Geographic spread of institutions in AI-related projects with US Participation (2014-2020)



Source: CORDIS' Dashboard, <https://webgate.ec.europa.eu/dashboard/sense/app/a976d168-2023-41d8-acec-e77640154726/sheet/e1b579a-669b-4962-bdb9-0151c523120f/state/0>

Concurrent to top-down, government-funded or endorsed AI research, academia and industry are establishing physical and digital research structures that require a certain degree of collaboration between specialized institutions. One example is the Paris Artificial Intelligence Research Institute (PRAIRIE), established in 2018 to support the scientific community by contributing to fundamental AI knowledge.³¹⁹ Its members and supporters include top research institutes, such as the French National Centre for Scientific Research, the Max Planck Institute in Germany, the Alan Turing Institute in the UK, the New York University's Center for Data Science, and the University of California, Berkeley's AI Laboratory (BAIR). These institutes work together with private sector partners from

319 Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem."

the US and Europe, such as Amazon, Criteo, Facebook, Faurecia, Google, Microsoft, Naver Labs, Nokia Bell Labs, PSA Group, SUEZ, and Valeo.³²⁰

Collaboration in the Health, Environmental Sciences, and Defense Sectors

Our assessment of existing transatlantic S&T cooperation and potential future applications of AI technologies has highlighted three sectors where US-EU collaboration on AI could be easily expanded. AI innovation and applications in the areas of healthcare, environmental sciences, and defense will be critical for the advancement of the “global good.”

Enhanced collaboration on AI in healthcare and environmental sciences will capitalize on existing S&T coordination and established research relationships.³²¹ The benefits from pooling resources on health-related and environmental sciences will outweigh apprehensions from private sector competition or government. AI-related cooperation in the defense sector is key for the continuation of historical security alliances.

Healthcare

Health-related research is one of the strongest axis of transatlantic research cooperation. As demonstrated in our analysis of US participation in Horizon 2020 (see Figure 17 and Figure 20), “Health, demographic change, and wellbeing,” is the second largest thematic priority of Horizon 2020 projects with US involvement and the largest thematic priority for existing AI-related collaborations in Horizon 2020. Example projects include NeuroDeRisk, which leverages AI tools for drug discovery.³²² Furthermore, a 2017 EC report on US-EU S&T cooperation cited the US as the main partner for health-related research both within Horizon 2020

320 Ibid.

321 An already mentioned example is the *Roadmap for EU-USA Science & Technology Cooperation*, which delineates health, bioeconomy, and marine and arctic research as priority areas for transatlantic research cooperation.

322 CORDIS, “Neurotoxicity De-Risking in Preclinical Drug Discovery,” CORDIS, n.d., <https://cordis.europa.eu/project/id/821528>.

and its predecessor, the 2007-2013 7th Framework Program (FP7).³²³ As of 2017, the US National Institutes of Health (NIH), National Science Foundation (NSF), and Bill and Melinda Gates Foundation were the main organizations contributing to US-EU health research. NIH's lead involvement is unsurprising given the NIH and EU mutually opened their health research programs to researchers from the EU and the US respectively. This reciprocity agreement enables US researchers to receive EU funding for health research, including within Horizon 2020, and EU researchers to receive NIH funding.³²⁴

Healthcare is a priority for both the US and EU. Both sides of the Atlantic have separately prioritized the healthcare sector as an area for increased AI investment, and COVID-19 has only intensified the call by governments and researchers to investigate AI applications in this space. The EC, in its *Communication: A European Strategy for Data*, identified health data as one of the nine areas where it should create a common European data space to enable “advances in preventing, detecting and curing diseases,” enable personalized medicine, and improve the healthcare system.³²⁵ This prioritization reflects the desire to facilitate research not only to improve health outcomes but also to capitalize on financial prospects of the largest AI industry, as healthcare AI companies attract the most VC funding.³²⁶ Some experts even estimate that the healthcare AI industry could grow from a \$2 billion global industry in 2018 to \$36 billion global industry by 2025.³²⁷ As detailed in the Introduction section, both the US and the EU governments have created COVID-19 data spaces accessible for researchers and turned to companies using AI and ML to detect COVID-19's spread, facilitate diagnoses, and fast-track the creation of treatments and a vaccine. Most recently, the Global Partnership on AI (GPAI), a coalition of the European Union plus 14 countries, including the US, determined its short-term goal

323 European Commission, “Roadmap for EU USA S&T Cooperation.”

324 “Horizon 2020: International Cooperation Opportunities in the WORk PRogramme 2016-2017” (European Commission, Directorate-General for Research and Innovation, 2016), http://ec.europa.eu/research/iscp/pdf/iscp_wp_2016_17.pdf; European Commission, “Roadmap for EU USA S&T Cooperation.”

325 European Commission, “A European Strategy for Data.”

326 Jared Council, “Health Care, Sales Software Draw Big AI Investments” (The Wall Street Journal, July 30, 2019), <https://www.wsj.com/articles/health-care-sales-software-draw-big-ai-investments-11564479007?mod=searchresults&page=2&pos=14>.

327 Gerrard Cowan, “ETFs with a Focus on Health-Care AI” (The Wall Street Journal, September 8, 2019), <https://www.wsj.com/articles/etfs-with-a-focus-on-health-care-ai-11567994401?mod=searchresults&page=2&pos=10>.

is investigating how AI can be leveraged to help the globe respond to the global pandemic.³²⁸

Environmental Sciences

While less prominent in political discussions, the environmental sciences³²⁹ sector is also a significant area of S&T and potential AI collaboration. The *Roadmap for EU-USA Science & Technology Cooperation*³³⁰ already includes marine and arctic research as well as research on the bioeconomy as priority S&T areas based on the work of the Joint Consultative Group established through the EU-US S&T agreement.³³¹ The EC's Joint Research Centre signed an implementing agreement in 2012 with the US NOAA, which was subsequently renewed in 2017.³³² This, and other S&T cooperative agreements like the US-EU-Canada Galway Statement on Atlantic Ocean Cooperation have enabled greater research, like joint mapping of the ocean floor.³³³ This prioritization is also reflected in the thematic priorities of projects with US participation (see Figure 17).

The US and EU are also separately engaging in various research projects in this field that leverage AI, whether to reduce humans' impact on the environment or to enable the efficient and effective use of energy and natural resources. NOAA researchers have projects on human-AI collaboration to enable better hurricane, tornado, and other severe weather predictions, applying ML techniques to assess fish and mammal populations using aerial and ship-enabled image collections systems, and predicting oil spills

328 "Launch of the Global Partnership on Artificial Intelligence by 15 Founding Members" (Ministere de l'Europe et des Affaires Etrangeres, June 15, 2020), <https://www.diplomatie.gouv.fr/en/french-foreign-policy/digital-diplomacy/news/article/launch-of-the-global-partnership-on-artificial-intelligence-by-15-founding>.

329 We consider environmental sciences to be very broad and includes applications such as: marine and arctic research, oceanography, research on pollution and air purification, disaster response, weather patterns, the bioeconomy, water resource monitoring, research on energy, and other physical, biological, and information sciences.

330 It was agreed by both the US and the EU within the framework of their joint committee and high-level dialogues in 2018. It was published by the European Commission.

331 European Commission, "Roadmap for EU USA S&T Cooperation."

332 European Commission.

333 European Commission; Wittke, "Enhancing Transatlantic Cooperation on AI."

and wildfires through ML techniques.³³⁴ NASA's Advanced Information Systems Technology program funds AI research into areas like water resource monitoring while the Department of Energy's High-Performance Computing for Energy Innovation Program (HPC4EI) works to improve energy utilization in manufacturing and develop clean energy through various AI and ML technologies.³³⁵ The EU has also undertaken a significant number of environmental sciences-related AI projects within its Horizon 2020 framework. Projects like the BRIDGE initiative and Encompass project seek to use AI to optimize smart grids, energy infrastructure, and other energy related needs.³³⁶ Through Eureka's³³⁷ Euripides 2 project, European countries have numerous projects applying AI and ML to detect harmful gases and pollutants at industrial plants and laboratories.³³⁸ The EU's AI research related to environmental sciences is only likely to increase as developing a "European Green New Deal" is one of the EC's priorities for the Von der Leyen's Presidency.³³⁹

334 Artificial Intelligence Research & Development Interagency Working Group, Subcommittee on Networking & Information Technology Research & Development, Subcommittee on Machine Learning & Artificial Intelligence, and the Select Committee on Artificial Intelligence of the National Science & Technology Council, "2016-2019 Progress Report: Advancing Artificial Intelligence R&D," November 2019; Select Committee on Artificial Intelligence of the National Science & Technology Council, "The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update" (Executive Office of the President of the United States, June 2019), <https://www.nitrd.gov/pubs/National-AI-RD-Strategy-2019.pdf>.

335 Artificial Intelligence Research & Development Interagency Working Group, Subcommittee on Networking & Information Technology Research & Development, Subcommittee on Machine Learning & Artificial Intelligence, and the Select Committee on Artificial Intelligence of the National Science & Technology Council, "2016-2019 Progress Report: Advancing Artificial Intelligence R&D," November 2019.

336 "Bridge: Horizon 2020" (The European Union, n.d.), <https://www.h2020-bridge.eu/>; "Encompass" (The European Union, n.d.), <http://www.encompass-project.eu/>.

337 Eureka is an international network, initially established in 1985, that aims to foster European competitiveness through increased R&D cooperation. It receives funding from various countries across Europe but has expended to receive funding from non-European countries. The US, however, is not a member. See <https://eurekanetwork.org/>.

338 "Running Projects: Euripides2" (Eureka, Euripides2, n.d.), <https://www.euripides-eureka.eu/projects>.

339 "6 Commission Priorities for 2019-2024" (European Commission, n.d.), https://ec.europa.eu/info/strategy/priorities-2019-2024_en; "A European Green Deal" (European Commission, n.d.), https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.

Defense

The US defense sector and the EU³⁴⁰ have separately recognized the importance of AI innovation and adoption. The Department of Defense's 2018 National Defense Strategy recognizes the need for the Department to modernize its programs and address changing threats posed by new technologies like AI.³⁴¹ The accompanying DOD Artificial Intelligence Strategy stressed that AI will change “the character of the future battlefield and the pace of threats” the US will face. Therefore, the AI Strategy outlined the need to develop and adopt AI to strengthen the DOD's capabilities, enhance and streamline businesses processes through AI and ML applications, cultivate its AI workforce, engage with industry and allies to enhance capabilities and security, and lead in military ethics around AI.³⁴² To lead defense-related AI efforts, the DOD created the Joint Artificial Intelligence Center (JAIC) in 2018 to: 1) accelerate the operationalization and adoption of AI across the DOD, 2) establish a “common foundation” to enable the DOD to scale AI's impact, 3) coordinate the DOD's AI priorities, and 4) attract and foster leading AI talent.³⁴³ The US has undertaken extensive AI and ML-related R&D and, as mentioned in the United States Government Funding section, defense-related AI R&D appears³⁴⁴ to be larger than non-defense AI R&D. For example, DARPA's AI Next Campaign—launched in 2018—focuses on improving the security, robustness, and reliability of AI and ML while decreasing the required

340 The European Union is not completely unified on its position regarding European defense capabilities or the application of AI in this realm. Ulrike Esther Franke, Policy Fellow at European Council on Foreign Relations, has noted that France tends to lead conversations about the use of AI in the military, while other countries like Germany and Austria are concerned about the use of AI to create autonomous weapons systems (“killer robots”). Additionally, the exit of the UK from the EU hinders US military cooperation with the EU as the UK had a strong military and intelligence relationship with the US, particularly given its place in Five Eyes.

341 “Summary of the 2018 National Defense Strategy of the United States of America” (U.S. Department of Defense, 2018), <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

342 “Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our Security and Prosperity” (Department of Defense, February 2019), <https://media.defense.gov/2019/Feb/12/2002088963/-1/-1/1/SUMMARY-OF-DOD-AI-STRATEGY.PDF>; “DOD Unveils Its Artificial Intelligence Strategy” (Defense.gov, February 12, 2019), <https://www.defense.gov/Explore/News/Article/Article/1755942/dod-unveils-its-artificial-intelligence-strategy/>.

343 “DOD Unveils Its Artificial Intelligence Strategy.”

344 The exact amount of defense-related AI R&D is classified.

computing resources, while its Artificial Intelligence Exploration (AIE) funds academia and small industry for high-risk, high-reward projects.³⁴⁵

The EU is less advanced in developing an AI strategy for the defense sector. This broadly stems from its comparatively more nascent defense industry and differing opinions between EU Member States on AI's defense applications. In 2017, the EU established the European Defense Fund (EDF) and the Permanent Structured Cooperation (PESCO) to bolster its security, defense industry, and strategic autonomy.³⁴⁶ EDF and PESCO, as Ulrike Franke, Policy Fellow at European Council on Foreign Relations explains, are vehicles to establish greater European defense collaboration, but these vehicles are not as developed or unified as other defense cooperative mechanisms or alliances like NATO.³⁴⁷ Furthermore, European Member States disagree about the role AI should play in the defense sector, with some countries extremely averse to the idea of developing lethal autonomous weapons systems (LAWS) given the trope of the "killer robot."³⁴⁸

Joint US-EU defense-related AI efforts appear sparse,³⁴⁹ however there is a growing push particularly from the US and NATO to increase transatlantic defense cooperation on AI. The aforementioned DOD Artificial Intelligence Strategy stressed the importance the US and allied partners to "maintain its strategic position to prevail in future battlefields and safeguard a free and open international order."³⁵⁰ Growing Chinese and Russia aggression and weaponization of new technologies like AI is a central motivation for the US government's push to strengthen the

345 Artificial Intelligence Research & Development Interagency Working Group, Subcommittee on Networking & Information Technology Research & Development, Subcommittee on Machine Learning & Artificial Intelligence, and the Select Committee on Artificial Intelligence of the National Science & Technology Council, "2016-2019 Progress Report: Advancing Artificial Intelligence R&D," November 2019; Select Committee on Artificial Intelligence of the National Science & Technology Council, "The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update."

346 Christian Larsen, "EU Should Remain Open to U.S. Defense Industry," *National Defense*, December 13, 2019, <https://www.nationaldefensemagazine.org/articles/2019/12/13/eu-should-remain-open-to-us-defense-industry>.

347 Ulrike Esther Franke, Policy Fellow at European Council on Foreign Relations, June 24, 2020.

348 Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center; Franke, Policy Fellow at European Council on Foreign Relations.

349 Note: this assessment is based on open-source research and information. It is possible there is classified collaboration ongoing.

350 "Summary of the 2018 Department of Defense Artificial Intelligence Strategy: Harnessing AI to Advance Our Security and Prosperity"; "DOD Unveils Its Artificial Intelligence Strategy."

international AI alliance.³⁵¹ Acting Director of JAIC Nand Mulchandani explains that collaboration with European partners on AI is necessary for three main reasons. First, joint AI R&D and adoption efforts are important for developing strong capabilities and bolstering transatlantic hard power. Second, leading AI capabilities--among the US and its allies--acts as a deterrent for conflict. Third, if deterrence fails, AI-related interoperability and capabilities are necessary if the US and its allies must go to war. A military alliance cannot be lopsided and unequal AI adoption may hinder the tactical aspects of conflict.³⁵² During the already mentioned recent visit to NATO headquarters in Brussels, Former Director of the JAIC Lt. Gen. Shanahan had collaborative engagements with European allies and NATO around the importance of AI joint efforts, ensuring military interoperability, and the convergence of Europe's AI ethical principles with the DOD's five principles of AI ethics.³⁵³ The visit appeared to increase NATO's focus on devising an AI strategy for the Alliance.³⁵⁴ Despite these positive steps, there are still concerns about potential obstacles to increased defense collaboration, particularly around IP ownership and funding restrictions that may exclude US involvement in EDF and PESCO.^{355, 356}

Overall, as noted in the US-EU roadmap for S&T, the volume and intensity of transatlantic scientific and technology collaboration has increased since the 1990s. Most notably, it has blossomed in areas where interests—whether strategic, societal, or economic—of both sides of the Atlantic overlap (e.g., in the health, environmental sciences, and energy sectors). However, in the case of AI there seems to be a large imbalance between the level, intensity, and volume of cooperation relative to the importance of AI. Indeed, both the US and the EU recognize AI's transformative potential

351 Yasmin Tadjdeh, "DoD Seeks AI Alliance to Counter China, Russia" (National Defense, March 3, 2020), <https://www.nationaldefensemagazine.org/articles/2020/3/3/algorithmic-warfare-dod-seeks-ai-alliance-to-counter-china-russia>.

352 Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

353 Ibid.

354 Franke, Policy Fellow at European Council on Foreign Relations; Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

355 EDF's IP rules state that only EU-based entities can own IP from projects and US firms are excluded from receiving defense funds. Some worry these rules may lead to the exclusion of US firms from EDF and PESCO, negatively impacting military interoperability and joint R&D (See Christian Larsen, *EU Should Remain Open to US Defense Industry*, National Defense (December 13, 2019).) While others like Ulrike Franke believe EDF and PESCO are primarily European collaboration vehicles and should not be the main avenue for transatlantic cooperation.

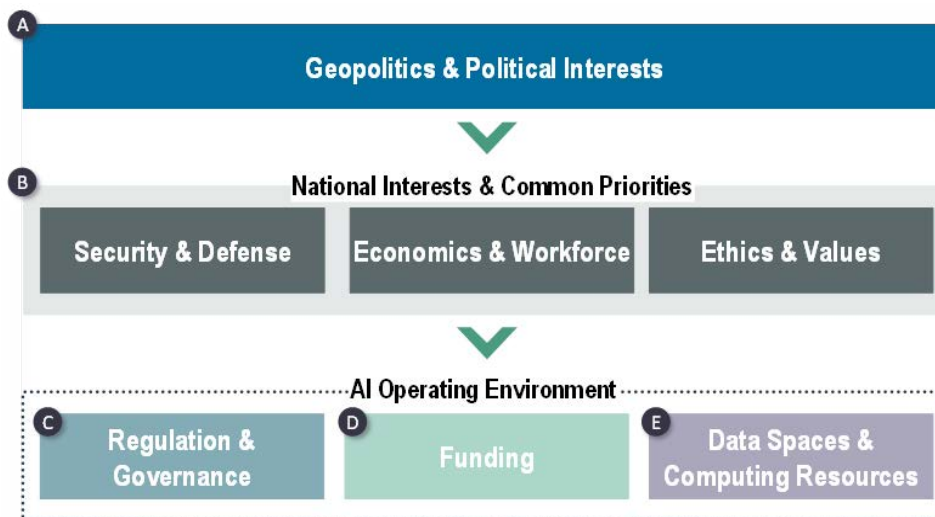
356 Larsen, "EU Should Remain Open to U.S. Defense Industry."

and share interests in its development and deployment. Yet transatlantic cooperation on AI is still its infancy—at least compared to other technological sectors. As a result, it has plenty of room to grow. Deepening this collaboration will not only require proactive efforts but also strategic endeavors to overcome the existing underlying challenges to collaboration.

Challenges to Collaboration & Recommendations

This paper argues that the US and the EU should increase their AI collaboration and partnerships to advance a world where AI is used to better peoples' lives, grow national economies, safeguard liberal values and civil liberties, increase global security and safety, and promote peace. However, it would be naïve to assume such collaboration would be without difficulties. This section provides an overview of the obstacles—real and perceived—that experts and government officials cite as potential impediments to transatlantic cooperation. We broadly consider the challenges to full collaboration as falling into five buckets that, although distinct, interconnect with each other (see Figure 23 below). Although the list of challenges is extensive, we believe the US and the EU share more commonalities than differences. In this section, we therefore 1) provide an overview of the obstacles and explain why they are not insurmountable and 2) recommend actions that both narrow divergences and build on areas of agreement. Ultimately, the US and the EU can undertake deliberative, strategic steps towards the full realization of AI collaboration that benefits their citizens, societies, and economies.

Figure 23: Overview of Challenges to Transatlantic Cooperation



A. Geopolitics & Political Interests

At the highest level, the US and the EU both recognize that prioritizing efforts to advance their global AI influence—through innovation, research, standards, hardware, and other AI-related avenues— is necessary to further their respective political interests. Furthermore, the US and EU understand that such efforts are needed to counteract Chinese and Russian efforts to progress authoritarian AI. We have already argued in *The Case for Transatlantic AI Cooperation* that the US and the EU must join forces to achieve these objectives. However, the US and EU’s relationship suffers from a trend of increasingly diverging political interests, often stemming from geopolitics (section A in Figure 23).

First, several events have bolstered a feeling of mutual resentment. The 2013 revelations—caused by Edward Snowden’s release of top-secret government documents—that the NSA’s large surveillance program included European targets, such as the European Union’s headquarters and German Chancellor Angela Merkel, seeded distrust.³⁵⁷ European leaders and citizens have become more hostile towards the intentions and trustworthiness of the US government and big technology companies.³⁵⁸ President Donald Trump’s isolationism, intensified criticism of Europe, and general negligence of many important European allies has further soured relations and bred resentment.³⁵⁹ The exit of the UK from the EU also removes a historically important interlocutor between the US and the EU, raising questions as to whether there is another EU member state that can or will fill that void.³⁶⁰ As the US has taken a step back in global leadership, countries like Canada have stepped up with increased partnership with Europe, through creation of the French-Canadian the Global Partnership for AI.³⁶¹ Although the US announced in late May 2020 that it was joining GPAI,

357 Paul Szoldra, “This Is Everything Edward Snowden Revealed in One Year of Unprecedented Top-Secret Leaks” (Business Insider, September 16, 2016), <https://www.businessinsider.com/snowden-leaks-timeline-2016-9>.

358 Tyson Barker, “Europe Can’t Win the Tech War It Just Started” (Foreign Policy, January 16, 2020), <https://foreignpolicy.com/2020/01/16/europe-technology-sovereignty-von-der-leyen/>.

359 Whineray, “US Relations with Europe Likely to Remain Strained Regardless Who Wins November Election”; Whineray, “Trump Has Irrevocably Changed American Relations with Europe--and Biden Probably Can’t Fix It.”

360 Birnbaum, “Who Becomes the US’s Best Friend in Europe after Britain Leaves the E.U.?”

361 Richard Hudson, “France and Canada Move Forward with Plans for Global AI Expert Council” (Science Business, November 19, 2019), <https://sciencebusiness.net/news/france-and-canada-move-forward-plans-global-ai-expert-council>.

along with the rest of the G7 plus the EU, Australia, India, Mexico, New Zealand, Republic of Korea, Singapore, and Slovenia,³⁶² the late arrival of the US to this coalition potentially hinders its influence.

Second, the EU seeks, as per expert Andrea Renda, to rebalance the international order through President Von der Leyen's "more strategic, more assertive, and more united" EU.³⁶³ Bolstered, but not necessarily as a result of, the frosting relations with the US, the EC seeks to increase Europe's ability to compete with China and the US digitally. Still according to Renda, the Commissioner for Internal Market Thierry Breton is leading EU's efforts to realize a vision of technological sovereignty, where the EU does not rely on foreign tech companies and data moves freely within the EU's single market.³⁶⁴ Increasingly protectionist voices within Europe urge leveraging EU's regulatory and normative power to combat big tech companies, many of whom are American (e.g., through a European tax on digital services), enable data repatriation efforts, and increase support for the European tech sector.³⁶⁵ In realizing this vision, the EU does not want to tie their future to the US and to a certain degree are more willing to engage with China and Russia, particularly evidenced by the controversy of using Huawei's hardware in their 5G networks.³⁶⁶

Regarding 5G, this willingness to engage with China stems from various political and economic considerations. For instance, there seems to have been a risk assessment mismatch relating to the proven security risk presented by Chinese-provided 5G equipment. This was rooted, in part, to a tense communication by President Trump and his administration and inefficient information and intelligence exchange of evidence between

362 "Launch of the Global Partnership on Artificial Intelligence by 15 Founding Members."

363 "The Observer View on the EU's Weakness on the World Stage." *The Guardian*, January 19, 2020, <https://www.theguardian.com/commentisfree/2020/jan/19/the-observer-view-on-the-eus-weakness-on-world-stage>; Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies.

364 Laura Kayali, Melissa Heikkila, and Janosch Delcker, "Europe's Digital Vision, Explained" (*Politico*, February 19, 2020), <https://www.politico.eu/article/europes-digital-vision-explained/>; Renda, "Artificial Intelligence: Ethics, Governance, and Policy Challenges."

365 Dale Crosby, "Here Comes European Protectionism," *Politico*, December 23, 2019, <https://www.politico.eu/article/european-protectionism-trade-technology-defense-environment/>; Eyes on Europe, "The European Union and the GAFA Issue," Eyes on Europe, *Eyes on Europe* (blog), December 11, 2017, <https://www.eyes-on-europe.eu/the-european-union-and-the-gafa-issue/>.

366 Carisa Nietzsche and Martijn Rasser, "Washington's Anti-Huawei Tactics Need a Reboot in Europe" (*Foreign Policy*, April 30, 2020), <https://foreignpolicy.com/2020/04/30/huawei-5g-europe-united-states-china/>.

America and its European counterparts. As a result, many European states believe that the overarching risks are manageable and containable by fragmented procurement throughout the network.³⁶⁷ As shown by the UK's recent shift and the current German debates, this position might still change.³⁶⁸ Meanwhile, this rapprochement has also been driven by the fact that many European states, out of economic necessity, have chosen the most cost-effective solution for 5G. At the same time some states also see it as an opportunity to reinforce its trading partnership with China.³⁶⁹ In the near future, 5G will probably continue to be a salient point of contention between both sides of the Atlantic. Until the issue is resolved, whether through a gradual alignment of European states with the US or joint efforts at the technical and service provider levels to create a transatlantic alternative (e.g. collaboration between European companies such as Nokia and American service provided such as Verizon), the 5G issue might inhibit or undermine greater US-EU collaboration on AI.³⁷⁰

Finally, COVID-19 may detract from the amount of attention policymakers in the US and the EU are willing and able to divert to AI collaboration. US-global leadership recedes still further and other countries grapple with domestic responses. As a second wave of COVID-19 is likely before the development of a vaccine, the US and European countries will likely be inwardly focused.³⁷¹ Multilateral institutions, international cooperation, and AI may suffer.

367 Ibid.

368 Adam Satarino, Stephen Castle, and David Sanger, "U.K. Bars Huawei for 5G as Tech Battle Between China and the West Escalates" (The New York Times, July 14, 2020), <https://www.nytimes.com/2020/07/14/business/huawei-uk-5g.html>.

369 Nietzsche and Rasser, "Washington's Anti-Huawei Tactics Need a Reboot in Europe"; Satarino, Castle, and Sanger, "U.K. Bars Huawei for 5G as Tech Battle Between China and the West Escalates."

370 Satarino, Castle, and Sanger, "U.K. Bars Huawei for 5G as Tech Battle Between China and the West Escalates"; Ibid.

371 Mat Burrows and Peter Engelke, "What World Post-Covid-19? Three Scenarios" (The Atlantic Council, April 2020), <https://www.atlanticcouncil.org/wp-content/uploads/2020/04/What-World-Post-COVID-19.pdf>.

Recommendations

The authors have identified three recommendations to address the aforementioned challenges posed by the geopolitical context and potential opposing political interests between the US and the EU. The recommendations are:

1. Pursue a narrative shift to bolster the importance of US-EU collaboration on AI.
2. Increase and/or restart high-level US-EU engagement and visits.
3. Jointly work together to create a broader international AI coalition of like-minded countries.

The rationale and expanded recommendations are detailed on the following pages.

A1. **Shift the Narrative from Adversarial to Collaborative**

Rationale: The US and the EU share a common goal of ethical AI applications that advance a safe, secure, and prosperous world. However, adversarial rhetoric bolsters the idea that the US and the EU are competitors that do not benefit from forming an alliance on the international arena. There are huge risks for the US and the EU if they fail to fill the liberal world order power vacuum to counter the leadership undertaken by China and Russia to advance unrestrained AI R&D.

The US and the EU, starting at the senior-levels of government before trickling down to all levels of government, should jointly increase rhetoric that highlights the importance of transatlantic collaboration in AI and underscores the benefits—for each respective country and for the world—of collaboration. To continue this historic partnership, the US must accept the EU has its own interests and concerns that need to be respected and considered. The EU must recognize that total AI autonomy and tech sovereignty is neither realistic nor preferable in many areas (e.g., defense applications). The EU should therefore soften its adversarial rhetoric against the US and its large tech companies (e.g., digital tax), otherwise it risks alienation by the US on more than just AI and technology.

Additional Considerations: Messaging must begin at the most senior levels, starting with the President of the US and the EU. Other senior leaders involved in AI cooperation, such as the US's Director of the JAIC, Secretary of State, and Secretary of Defense as well as the EC's Executive Vice-President for "A Europe for the Digital Age," High Representative, and Commissioner for the Internal Market, should also change their rhetoric. This will best ensure the narrative shift trickles down throughout all levels of government and across all stakeholders involved in AI collaboration. Domestic politics may, however, make it hard for both the US and the EU to change their public rhetoric, but senior leaders should still strive to communicate disagreements privately.

A2. Increase High-level Engagements

Rationale: High-level visits highlight the importance placed on US-EU collaboration, demonstrating to the US and EU that their respective partnership is valued and signaling to the world that the US and the EU are aligned and working together. These visits also offer the opportunity for leaders and their staff to lessen disagreements and identify opportunities for greater alignment. The January 2020 visit of JAIC's Former Director, Lt. Gen. Jack Shanahan was well-received by their European counterparts, indicating similar visits were also desired.

The US and the EU should increase their high-level visits. The visits should include government officials from across the full interagency on a variety of topics (e.g., defense, economics, labor, science, healthcare, trade, patents). Visits should be led by the highest levels (e.g., Director, Secretary, and Commissioner level) with an AI-related visit occurring at least quarterly during this important strategy planning and coordinating phase.

Additional Considerations: The US and the EU had begun to increase their senior visits, but many were cancelled because of COVID-19. Because these visits are most useful if in person, they should restart once travel reopens. However, virtual alternatives should be identified and utilized in the interim.

A3. Foster a Like-Minded Coalition

Rationale: A broader international effort will strengthen the US and the EU's ability to promote AI ethics, R&D, and applications that protect their interests and safeguard their shared values. Furthermore, expanding the coalition offers great benefits for AI development (e.g., more diverse and higher-quality data, greater expertise, trusted supply chains for AI-related hardware). Furthermore, if the US and the EU work together they may have better success at courting allies, particularly those currently sympathetic to China's AI vision³⁷².

The governments of the US and the EU and respective bodies (e.g. NSC, OSTP, EC) should work together to build a larger coalition of nations that share their AI vision and work with them in the international arena to promote that shared vision. This coalition should also include defense alliances like NATO.

Additional Considerations: There are many countries that should be included in this coalition; however, natural considerations are Canada, Japan, South Korea, Israel, Singapore, as well as European countries not in the EU (e.g., the UK). The GPAI should be investigated as a potential vehicle for this collaboration. The recommended increased high-level engagements (A2) and US-EU Dialogues on AI (B1) would be a good vehicle for the governments to determine their approach.

372 Brown, "Artificial Intelligence and the Transatlantic Alliance."

B. National Interests & Common Priorities

Informed by the broader geopolitical trends that color the US-EU relationship, there are three distinct considerations that permeate discussions about transatlantic AI efforts. Often described as national interests³⁷³ in US national strategy³⁷⁴ documents and common ideas and priorities³⁷⁵ by the European Commission,³⁷⁶ these three non-exhaustive categories are (section B in Figure 23):

1. Preserving domestic and collective security, often through a strong defense apparatus.³⁷⁷
2. Promoting a strong economy and workforce.
3. Safeguarding democratic ethics and values.

On security and defense, the EU and US are broadly aligned in their belief that China and Russia represent strategic rivals, particularly in AI. However, the US has taken a much more aggressive stance towards China, with many in the EU wanting to engage with China to secure a large market for their exports amongst other reasons.³⁷⁸ Because of this, EU policymakers tend to bristle at US calls to join forces and squeeze China out of certain industries and supply chains viewed as critical to its national security; the disagreement over handling Huawei in 5G networks was a case in point.³⁷⁹ President Trump's dismissal of NATO and calls by European

373 President of the United States of America, Donald Trump, "National Security Strategy of the United States of America," December 2017.

374 The US 2017 *National Security Strategy* identifies four vital national interests: protecting "the American people, the homeland, and the American way of life," promoting "American prosperity," preserving "peace through strength," and advancing "American influence."

375 The *Political Guidelines for the Next European Commission 2019-2024* details six "headline ambitions" that draw on "common ideas and priorities".

376 Ursula von der Leyen, "A Union That Strives for More: My Agenda for Europe: Political Guidelines for the Next European Commission 2019-2024" (European Commission, https://ec.europa.eu/info/sites/info/files/political-guidelines-next-commission_en_0.pdf).

377 This is less the case at the EU level as defense remains mostly in the hands of the Member States.

378 Erik Brattberg and Philippe Le Corre, "The EU and China in 2020: More Competition Ahead" (Carnegie Endowment for International Peace, February 19, 2020), <https://carnegieendowment.org/2020/02/19/eu-and-china-in-2020-more-competition-ahead-pub-81096>.

379 Nietzsche and Rasser, "Washington's Anti-Huawei Tactics Need a Reboot in Europe"; "America Urges Europe to Join Forces Against China" (The Economist, February 16, 2020), <https://www.economist.com/europe/2020/02/16/america-urges-europe-to-join-forces-against-china>.

leaders to increase their domestic security capabilities acts as a further underlying source of tension about a joint path forward to ensure AI adoption furthers transatlantic security.³⁸⁰

As mentioned throughout this report, both the US and the EU recognize the potential economic growth outflowing from widespread AI adoption and innovation. Although both are eying China's private sector with caution, the EU and the US do recognize they are competing with each other for talent, funding, and progress. The EU lags behind the US and China for AI talent, with many in Europe blaming the US. For example, between 2012 and 2016, US firms bought 44% of Europe's tech startups.³⁸¹ Furthermore, the EU and Member States have increasingly investigated US big technology firms like Google, Facebook, Amazon, and Twitter for violations of antitrust laws and GDPR, with the EU imposing billions of dollars in fines to Alphabet Inc. alone.³⁸² These investigations reflect the desire to crack down on what many in Europe see as predatory practices, as well as provide an opportunity for the EU's domestic companies to grow and compete which underpins commissioners' goals of technological sovereignty. The crack down on big tech also reflects a fundamental difference between the EU and the US on the role of government: the EU, in comparison to the US, believes in bigger government to regulate and enforce protections of its citizens.

Ethics and values, as we, experts Ryan Budish and Andrea Renda, and Acting Director of the JAIC Nand Mulchandani have mentioned, is an area where the US and the EU are broadly aligned particularly at the highest levels.³⁸³ However, we do see the potential for discrete areas of disagreement on the uses of AI (e.g., the use of lethal autonomous weapons, facial recognition software) and the specifics of operationalizing principles. Underpinning these disagreements will be the aforementioned

380 Erlanger, "Europe Vows to Spend More on Defense, but US Still Isn't Happy."

381 Lionel Laurent, "Google and Facebook Are Sucking the Brains Out of Europe" (The Washington Post, July 1, 2019), https://www.washingtonpost.com/business/google-and-facebook-are-sucking-the-brains-out-of-europe/2019/07/01/cbbd94dc-9be7-11e9-83e3-45fdd8e8d2e_story.html.

382 Parmy Olson, "European Regulators Target Big Tech Companies" (The Wall Street Journal, January 20, 2020), <https://www.wsj.com/articles/european-regulators-target-big-tech-companies-11579542357>.

383 Budish, Assistant Research Director at the Berkman Klein Center for Internet & Society at Harvard University; Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center; Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies.

tension between the EU and the US on how to mitigate potential threats posed by unethical, untrustworthy, harmful, and biased AI. As experts work on developing standards and provide guidelines (i.e., for example to illustrate that the data and system do not have unintended bias), the US and the EU may diverge in how much these ethical principles should be formalized in regulation with the EU preferring proactive legislation and the US, as Renda points out, urging industry to lead on standards development (please see AI Operating Environment section on Regulations & Governance).³⁸⁴

Recommendations

The authors identified five recommendations to address challenges posed by competing US national interests and EU common priorities, particularly in the areas of security and defense, economics and the workforce, and ethics and values. The recommendations are:

1. Establish US-EU Track 1 dialogues.
2. Increase joint research and development (R&D) efforts.
3. Establish mechanisms for sharing best practices and information related to AI.
4. Pursue joint talent exchanges as well as coordination of AI training and education programs to strengthen the skills of their respective workforce and AI-related talent.
5. Counter industrial espionage and nefarious private AI-related investments jointly.

The rationale and expanded recommendations are detailed on the following pages.

³⁸⁴ Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies.

B1. Establish US-EU Dialogues on AI

Rationale: Track 1 dialogue across the United States and the European Union's interagency on a broad range of AI-related topics can:

- Reinforce the need for and importance of the historic partnership to include AI cooperation (Recommendation A1, A2).
- Act as a confidence-building mechanism during times of tension.
- Provide the opportunity for communicating points of agreement and disagreement.
- Signal globally that the US and the EU are partners in advancing a shared AI vision (Recommendation A3).
- Facilitate cooperation and alignment across the entire federal government across a broad range of AI related topics.
- Facilitate identification and of agreement to joint R&D (Recommendation B2).
- Enable identification of each country's comparative advantage in AI tech and AI-related hardware production (Recommendation E3).

Talks dedicated to emerging technology, or AI specifically, can enable and strengthen the execution of all other recommendations in this paper.

The US and the EU should establish a track 1 dialogue to achieve the outcomes discussed above. These dialogues can be standalone or part of a broader, ongoing US-EU dialogue. Additionally, track 1.5 and 2 dialogues should supplement this dialogue to address certain points of disagreement and better facilitate productive track 1 summits.

Additional Considerations: These dialogues can be modelled after the Canada-EU Digital Dialogues that began in summer 2019 and included discussions on promoting ethical AI, sharing best practices, joint cooperation,

and establishing the Global Partnership on Artificial Intelligence (GPAI).³⁸⁵ Another potential model for these dialogues is the EU-US energy talks that include discussions on energy policy, supply, and technology research and have helped enable communication during times of crisis.³⁸⁶

B2. Increase and Formalize AI-Related Joint R&D

Rationale: Joint R&D can help strengthen US-EU AI cooperation, advance AI R&D with shared goals and values, and help pool resources and expertise to enable greater research impact and larger scale research on topics of importance for the US, the EU, and the world. Coordination can also help identify duplicative research that should be turned into joint efforts. There are many areas where joint research is not only beneficial, but likely necessary to ensure the global good of innovation outweighs potential global harm (e.g., defense applications of AI, pandemic-related research, climate change-related research, acquiring diverse training data, ocean floor mapping).

The US and the EU should increase and formalize joint R&D on AI-related topics and sector-specific applications that utilize AI. This outcome can be achieved through various avenues: joint research ventures, increasing US involvement in Horizon 2020 (Recommendation D3), establishing a formal R&D and/or data sharing agreement, and coordinating international private partnerships.

Sub-recommendation: Research partnerships should span the entire AI ecosystem, but the healthcare, defense, and environmental sciences should be prioritized because of their global importance there are areas of existing coordination and alignment that can be built upon. Additionally, the US

385 Stéphane Lambert, "Enhancing Transatlantic Cooperation on AI" (Center for Data Innovation, July 3, 2019), <https://itif.org/events/2019/07/03/enhancing-transatlantic-cooperation-ai>; "Annual Report on the State of Canada-European Union Relations: June 2018 - January 2020" (Joint Cooperation Committee to the Joint Ministerial Committee of the Government of Canada, n.d.), https://www.international.gc.ca/world-monde/international_relations-relations_internationales/can-eu_spa-aps_can-ue-2020.aspx?lang=eng; "Canada-EU Summit Joint Declaration" (Justin Trudeau, Prime Minister of Canada, July 18, 2019), <https://pm.gc.ca/en/news/backgrounders/2019/07/18/canada-eu-summit-joint-declaration>.

386 Wittke, "Enhancing Transatlantic Cooperation on AI."

and the EU should fund joint efforts to operationalize principles, verification mechanisms, and standards (Recommendation C1).

Additional Considerations: See case studies for rationale of emphasis on healthcare, defense, and environmental science research. Canada's recent agreements with the EU, as well as the 1999 Canada-EU Treaty on Scientific and Technology Cooperation, could provide examples for collaboration.

B3. Share Best Practices Across a Variety of AI-Related Topics

Rationale: Sharing of information and best practices between the US and the EU's public and private sector can help increase coordination and strengthen alignment. Sharing of best practices can also, crucially, build capacity of the domestic workforce and institutions across a variety of topics, including, but not limited to:

- Increasing and facilitating AI-related research (Recommendation B2).
- Increasing government adoption of AI.
- Training and building an AI workforce (Recommendation B4).
- Countering industrial espionage (Recommendation B5).
- Spurring AI innovation and growth within the private sector.
- Operationalizing principles and verification mechanisms (Recommendation C1).
- Addressing domestic impediments to data collection, governance, use, and sharing (Recommendation E2).

The US and the EU should formalize sharing of information and best practices. The avenues for this coordination can take several, or all, of the following forms:

1. **Alliance between US and EU Centers of Excellence; potential collaborators include:**
 - a. **The US General Services Administration (GSA) has established an AI Center of Excellence, as part of its broader IT Modernization Centers of Excellence initiative. The CoE aims to assist federal departments and agencies develop and apply AI solutions. The US Department of Agriculture (USDA), US Department of Housing and Urban Development (HUD), US Office of Personnel Management (OPM), the US Consumer Product Safety Commission, the US Department of Labor (DOL), and the US Department of Defense’s Joint Artificial Intelligence Center (JAIC) is working with the CoE.³⁸⁷**
 - b. **The forthcoming National AI Research Institutes that are being established by the NSF in partnership with USDA, the Department of Homeland Security, the Department of Transportation, and the Department of Veterans Affairs. These Institutes will bring together academia, industry, agencies, and non-profits on either one of six “Institute” tracks or one of eight “planning tracks”.^{388, 389}**

387 “GSA, DOL Partner in Centers of Excellence Initiative” (U.S. General Services Administration, February 13, 2020), <https://www.gsa.gov/about-us/newsroom/news-releases/gsa-dol-partner-in-centers-of-excellence-initiative>; “GSA, JAIC Partner in Centers of Excellence Initiative” (U.S. General Services Administration, September 25, 2019), <https://www.gsa.gov/about-us/newsroom/news-releases/gsa-jaic-partner-in-centers-of-excellence-initiative>; “Artificial Intelligence: Accelerate Adoption of Artificial Intelligence to Discover Insights at Machine Speed” (U.S. General Services Administration, November 2019), <https://coe.gsa.gov/docs/2019/AIServiceCatalogNov19.pdf>.

388 “National Artificial Intelligence (AI) Research Institutes: Accelerating Research, Transforming Society, and Growing the American Workforce” (National Science Foundation, n.d.), <https://www.nsf.gov/pubs/2020/nsf20503/nsf20503.htm>; “17. Research and Development, FY 2021 Budget Request” (Executive Office of the President, n.d.), https://www.whitehouse.gov/wp-content/uploads/2020/02/ap_17_research_fy21.pdf; “National Artificial Intelligence (AI) Research Institutes” (National Science Foundation, n.d.), https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505686.

389 Institute tracks are: Trustworthy AI, Foundation of Machine Learning, AI-Driven Innovation in Agriculture and the Food System, AI-Augmented Learning, AI for Accelerating Molecular Synthesis and Manufacturing, AI for Discovery in Physics. Planning tracks are: biological sciences, computer and information science and engineering, education and human resources, engineering, geosciences, mathematical and physical sciences, social and behavioral sciences, integrative activities.

- c. **The European Commission has called for 30 AI-focused Digital Innovation Hubs³⁹⁰ to coordinate collaboration and provide sector-specific expertise, technology, and resources.³⁹¹**
 - d. **The EU is in the process of putting into place various networks of Centers of Excellence across major research centers. These will share common research agenda, collaborative projects and exchange programs and emphasize links to the industry and the digital innovation hubs. They are supported by AI4EU, which is a coordination and tool repository platform that aims at fostering a collaborative AI ecosystem in Europe.³⁹²**
2. **Establishing a shared platform to coordination research and sharing of best practices. This platform could be modeled after the expired Bilat 4.0, which coordinated US involvement in Horizon 2020 and facilitated best practice sharing across industry and academia.³⁹³**
 3. **Dialogues and/or networking events focused on sharing of best practices within specific sectors or topic areas.**

Sub-recommendation: To guide decisions and ensure AI R&D and use respects shared values, a focus on applied AI ethics and operationalizing principles should be included.³⁹⁴

Additional Considerations: It is unlikely that one center or excellence or mechanism for sharing of best practices will be sufficient for the entire AI landscape. Therefore, the US and the EU should expect to pursue multiple, parallel mechanisms to share best practices on specific areas of interest.

390 There are currently around 450 Digital Innovation Hubs as part of the Digital Single Market and Digitise European Industry initiatives.

391 Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem."

392 Ibid.

393 "Bilat USA 4.0: General" (Bilateral Coordination for the Enhancement and Development of S&T Partnerships between the European Union and the United States of America, n.d.), <https://www.eusscienceandtechnology.eu/target-groups/general>.

394 This recommendation is informed through conversations with Professor of Theoretical Philosophy Thomas Metzinger and Assistant Research Director at Berkman Klein Ryan Budish.

B4. Improve Workforce AI Literacy & Strengthen AI Talent

Rationale: The United States and the European Union are both concerned about building up their domestic AI talent, increasing AI-related skills and literacy of their workforce, strengthening their AI training in government and academia, attracting AI talent through immigration, and retaining talent. Talent exchanges, joint visa programs, and sharing of best practices in AI-related training and education initiatives can help the US and the EU achieve some of these goals.

The US and the EU should pursue multiple efforts to strengthen their AI workforce and talent, such as:

- **Increasing government talent exchanges (throughout their respective interagency) to increase AI alignment, facilitate cross-pollination of ideas, and build the skills of their workforce. Talent exchanges in industry and academia are also beneficial.**
- **Coordinating on developing AI training for government employees and sharing of best practices.**
- **Sharing best practices (Recommendation B3) on developing AI curriculum for schools and universities; this coordination will need to include stakeholders from academia. *Note: The US could learn from the EU's current efforts to include "Artificial Intelligence and Analytics" in their Digital Education Plan.*³⁹⁵**

Efforts can be standalone or included in broader US-EU dialogues (Recommendation B1).

Sub-recommendation: Government, industry, and academia need AI experts and a workforce literate not just in the technical and political aspects of AI, but also its ethical implications. As Thomas Metzinger explains, a new generation of specialized ethicists is particularly important in industry where the level of technical proficiency is high, but AI ethicists may not be included,

³⁹⁵ "Artificial Intelligence" (European Commission, April 16, 2020), <https://ec.europa.eu/digital-single-market/en/artificial-intelligence>; "Digital Education Action Plan - Action 10 Artificial Intelligence and Analytics" (European Commission, n.d.), https://ec.europa.eu/education/digital-education-action-plan-action-10-artificial-intelligence-and-analytics_en.

available, or empowered.³⁹⁶ Joint talent and education efforts should therefore include a focus on AI ethics and trustworthy AI. The NSF's National AI Research Institute on Trustworthy AI should be included.

Additional considerations: USMCA continued TN visas, which provided Canadian and Mexican citizens with specific educational backgrounds a generally easier path than H1B visas to work in specific US jobs (e.g., consultants, engineers, lawyers).³⁹⁷ Although a free trade agreement with a similar visa may be desired by the US, the EU's grave concerns about brain drain may preclude such efforts.

B5. Counter Industrial Espionage & Nefarious Private Investment

Rationale: US efforts to counter adversarial attempts to steal commercial secrets, intellectual property, and proprietary technology include identifying nefarious actors within the US as well as screening foreign investment, through the Committee on Foreign Investment in the United States (CFIUS), and determining if the investment should be stopped due to national security considerations.³⁹⁸ Multilateral coordination efforts and screening procedures could improve these efforts to counter industrial espionage and nefarious investment.³⁹⁹

The US and the EU should share intelligence as well as best practices to identify and prevent nefarious commercial activity related to AI, including nefarious investment and IP theft. The US and the EU should also explore options to establish and improve coordination of investment screening practices and information sharing between CFIUS and similar bodies. Efforts can be standalone or included in broader US-EU dialogues (Recommendation B1) or effort to share best practices (Recommendation B3).

³⁹⁶ Metzinger, Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz.

³⁹⁷ "TN NAFTA Professionals" (U.S. Citizenship and Immigration Services, n.d.), <https://www.uscis.gov/working-united-states/temporary-workers/tn-nafta-professionals>; Susan Sukkar, "USMCA: Immigration Chapter and TN Visas Unaffected by New Law" (JDSupra, Dickinson Wright, February 3, 2020), <https://www.jdsupra.com/legalnews/usmca-immigration-chapter-and-tn-visas-92274/>.

³⁹⁸ "The Committee on Foreign Investment in the United States (CFIUS)" (U.S. Department of Treasury, n.d.), <https://home.treasury.gov/policy-issues/international/the-committee-on-foreign-investment-in-the-united-states-cfius>.

³⁹⁹ "Interim Report" (National Security Commission on Artificial Intelligence, November 2019).

AI Operating Environment

On a tactical level, there are many details across the AI operating environment that will pose specific implementation challenges for increased AI collaboration. We define the AI operating environment to broadly include regulation and governance (including legal liability frameworks and standards), funding and investment, data and data spaces, as well as the software, hardware, and computing resources that facilitate AI systems.

C. Regulation & Governance

Although the US and the EU broadly agree on AI principles (see Figure 2: US-EU Alignment on AI Principles), as Acting Director of the JAIC Nand Mulchandani and Assistant Research Director at the Berkman Klein Center Ryan Budish mentioned,⁴⁰⁰ the US and the EU have diverging approaches—born out of structural and historical differences—to the role of government as a regulator (section C in Figure 23). Broadly speaking and as Head of Global Governance, Regulation, Innovation and the Digital Economy at the Centre for European Policy Studies Andrea Renda puts it, the US tends to have robust tort law and ex post facto laws that allow courts to hold products and companies accountable after the harm is committed. Conversely, the European Parliament relies more on an ex ante approach where they add pre-conditions and regulations at the front end with less litigious activity afterwards. Although the US views this approach to regulation as overburdensome, this is one reason the EU tends to have stricter laws (e.g., GDPR).⁴⁰¹

However, these differences are not irreconcilable and the trends in AI suggest that neither the US nor EU—due to its suggestion to regulate only “high-risk” sector—will tend towards overburdensome regulation. Instead the EU and US may pursue a more decentralized approach guided by principles, which will beg the question: how can these principles be

400 Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center; Budish, Assistant Research Director at the Berkman Klein Center for Internet & Society at Harvard University.

401 Renda, “Artificial Intelligence: Ethics, Governance, and Policy Challenges.”

operationalized, and verification mechanisms and standards be created? Despite increased attention on this area, as expert Ryan Budish points out, there is still significant confusion—within industry, government, and academia—about how to operationalize these principles or verify that the principles have been sufficiently considered and executed.⁴⁰² Governments, regulators, academics, and industry leaders need to determine, for example, what is meant by “trustworthy AI” and how principles like traceable and equitable can be tested and proved before the technology is deployed.

Recommendations

The authors have identified two recommendations to address challenges posed by competing regulatory and governance approaches. The recommendations are:

1. Support and pursue joint efforts to operationalize principles, verification mechanisms, and standards.
2. Align future AI-related regulation to prevent unintentional hampering of innovation and collaboration.

The rationale and expanded recommendations are detailed on the following page.

⁴⁰² Budish, Assistant Research Director at the Berkman Klein Center for Internet & Society at Harvard University.

C1. Operationalize Principles, Verification Mechanisms, & Standards

Rationale: Joint efforts will help prevent inconsistencies across the two markets that may prevent research collaboration, deepen political disagreements, hamper commercial innovation, or preclude companies from entering both markets. Coordination can increase leverage of the US and the EU in multilateral discussions (e.g., OECD, ISO/IEEE) and push-back against efforts from adversaries to promote AI counter to civil liberties and the interests of the US and the EU. Additionally, joint efforts may help bridge gaps between the US and the EU: the EU may realize they cannot identify and regulate against all potential problems at the front-end and the US may realize there are some unintended consequences that require regulation.

Pursue Track 1, 1.5, and 2 to coordinate efforts or establish inter-governmental working groups or commissions. AI ethicists should be included. Efforts can be standalone or included in broader US-EU dialogues (Recommendation B1) or a joint research roadmap (Recommendation B2). Flexible organizations and mandates as well as consistent, regular communication will help stakeholders adapt to an ever-changing AI context.

Additional Considerations: A potential partner is the Berkman Klein Center at Harvard University, which has an AI Policy Practice Project that, as Assistant Research Director Ryan Budish explains, works to help turn AI principles into operational realities by working with organizations as they seek to identify effective practices.

C2. Align Future AI-Related Regulation

Rationale: Like Recommendation C1, consistent communication and coordination will help prevent inconsistencies across the two markets that may hamper commercial innovation or preclude companies from entering both markets, which could deepen political tensions.

Pursue Track 1 and 1.5 dialogue to align on AI-related regulation, including regulation around data collection, management, and use. More formalized coordination enables both governments to provide rationales and communicate concerns. These efforts likely to be included in broader US-EU dialogues (Recommendation B1).

Additional Considerations: Coordination is likely already occurring (e.g., on the European Union's proposed digital tax), but should continue and begin at earlier stages in the political process.

D. Funding

Joint AI efforts will require funding from both sides of the Atlantic (section D in Figure 23). Given the large range of potential funding sources—from private sector capital to public sector grants—it is up to debate how much a lack of funding concretely hinders transatlantic AI research and joint ventures across industry and academia. However, different overarching governmental funding structures between the US and the EU could complicate joint projects. For example, the EU provides more top-down, overarching funding vehicles for S&T (e.g., Horizon 2020). While the NSF is the US government’s main vehicle for funding S&T research, the sheer number of US government departments and agencies and the decentralized funding mechanisms can erect artificial transaction costs and complications for cooperation with the EU (at government-level and with research institutions).⁴⁰³ Given the ability of unnecessary funding restrictions to decrease US-EU joint R&D, as well as the potentially powerful role funding mechanisms could play to incentivize joint projects, the US and the EU should address any challenges arising from funding.

Recommendations

The authors have identified three recommendations to address challenges posed by diverging funding mechanisms and prioritizations. The recommendations are:

3. Increase US involvement in Horizon 2020.
4. Include the US in future EU AI mega-projects, if developed.
5. Survey current government R&D collaboration in order to build off existing partnerships and address impediments to collaboration.

The rationale and expanded recommendations are detailed on the following page.

⁴⁰³ Wittke, “Enhancing Transatlantic Cooperation on AI.”

D1. Increase US Involvement in Horizon 2020 and Horizon Europe

Rationale: Increased involvement, be it financially or intellectually, in Europe's AI research and innovation programs would be a positive and symbolic signal indicating rapprochement and alignment necessary to counterbalance China. It would also help foster additional innovative links between the two continents that could have positive ripple effects for both societies and economies.

The US should increase its involvement in Horizon 2020 and its successor Horizon Europe, which can take several forms. We recommend the US increase its investment. This effort can be modeled after Canada's 2019 announcement to invest \$50M over five years to Horizon 2020.⁴⁰⁴ Meanwhile, as a Third Party⁴⁰⁵ without an associated co-funding mechanism, both the US and the EU should consider negotiating one. It could cover all thematic areas (e.g., as Korea, Russia or Mexico executed) or selected ones (e.g., as demonstrated by agreements with Australia, Japan, China) specific to AI. Efforts can be standalone or included in broader US-EU dialogues (Recommendation B1) or a joint research roadmap (Recommendation B2).

Additional Considerations: Horizon 2020 and Horizon Europe may not be the best way to increase R&D but it is a relatively easy way to increase joint research as Horizon 2020 is a well-established avenue to facilitate multilateral efforts. Additionally, the designation of the US as a third-country party is symbolically important for transatlantic cooperation.

404 "Canada-EU Summit Joint Declaration."

405 As a Third party, US researchers are not automatically eligible for funding under the Horizon 2020 and Horizon Europe and often cannot sign for legal reasons EU Grant Charters, which are necessary conditions for participation to these projects, thus greatly limiting its access to EU projects on AI. In the case of self-funding the EU and the US have signed in 2016 an implementing agreement that enable researchers to organize their cooperation outside the formal Horizon 2020 Grant Agreement.

D2. Include the US in Future EU AI Mega-projects

Rationale: European AI researchers have proposed several AI mega-projects—like CERN for AI, the European Lab for Learning and Intelligent Systems (ELLIS), and the Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAIRE)⁴⁰⁶ to facilitate joint research. If these projects are developed, the involvement of US researchers could facilitate cross-pollination of ideas and strengthen US-EU research and alignment on AI.

If the European Union creates an AI mega-project, US researchers should be involved. If possible, the US government should be formally involved with the project. Inclusion could be discussed in broader US-EU dialogues (Recommendation B1) or a joint research roadmap (Recommendation B2).

Additional Considerations: It is not clear how politically viable these projects are, but the underlying consideration is that the US and EU should enable participation of their researchers if either pursues large-scale, collaborative research on AI.

⁴⁰⁶ Stix, "A Survey of the European Union's Artificial Intelligence Ecosystem."

D3. **Build on Existing US-EU Government Collaboration**

Rationale: There is already research collaboration between the US, EU, and EU Member States; however, coordinating research with the US government can be cumbersome because of its highly decentralized funding structures relative to the EU. The US therefore needs to review its existing European collaboration and identify ways to build on these efforts.

The US, led by the NSTC AI R&D Interagency Working Group, should conduct a survey of existing joint European research across all 24 federal agencies under its purview. Although this WG focuses on AI research, the review should seek to identify all joint research efforts on all topics, as possible, to ensure opportunities for collaboration are not missed. If possible, the EU, led by the Commission's Joint Research Center, should conduct a similar review and request the same of Member States. The review should identify impediments to collaboration, the focus of the project, the funding structure, and relevant legislation or authorities that enabled this collaboration. Impediments should be remediated and areas that could enable further AI collaboration explored. This effort is likely a precondition to any meaningful effort to increase joint AI R&D (Recommendation B2) and could be discussed in broader US-EU dialogues (Recommendation B1).

Additional Considerations: This effort will likely require significant resources as collecting this information is likely difficult. The EU should also pursue the same exercise.

E. Data spaces, Hardware, & Computing Resources for AI

A robust suite of data, secure hardware, and ample computing resources are central to AI innovation and adoption (section E in Figure 23). According to Acting Director Nand Mulchandani, both the US and the EU recognize the need to have high-quality, diverse datasets that are readily accessible and usable by relevant stakeholders. Accordingly, the EC and Commissioner Breton, as expert Andrea Renda explains, are pushing for the creation of sector-specific data spaces as part of the EU's technological sovereignty. Although these data spaces are intended to increase Europeans access to data, it is an open question whether US government agencies or researchers would be provided access to these data spaces.⁴⁰⁷ In the US, the American AI Initiative similarly states the importance of open datasets, but there is not a similar public call for creating data spaces. On both sides, data access is significantly impeded by resource-constraints that hinder data collection, storage, and standardization so that it is machine-readable, interoperable, and ensures privacy. Similarly, countries are starting to recognize the importance of ensuring a secure supply of hardware and other computing resources critical for advanced AI algorithms. and government investment to maintain a competitive advantage in semiconductors and chips used for AI, particularly given national security concerns around China's semiconductor investments.⁴⁰⁸

407 Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies.

408 Khan, "Maintaining the AI Chip Competitive Advantage of the United States and Its Allies"; Whalen, "US Tries to Narrow Loophole That Allowed China's Huawei to Skirt Export Ban."

Recommendations

The authors have identified three recommendations to address challenges posed by the formalization of data spaces and datasets as well as the desire to maintain an edge over China and other adversaries in the development and production of hardware related to AI. The recommendations are:

1. Pursue efforts to enable data sharing for joint research and development.
2. Address domestic data sharing impediments that may prevent transatlantic cooperation.
3. Identify countries' comparative advantage in AI related hardware production and sourcing to support desired changes in AI-related supply chains for national security or economic considerations.

The rationale and expanded recommendations are detailed on the following page.

E1. Enable Data Sharing for R&D

Rationale: The European Union has recommended the creation of sector-specific data spaces and open data within the Union’s single market. However, there is concern that these data spaces will not be open to non-EU researchers and entities. Even if they are not intentionally restricted to EU stakeholders, a lack of coordination with the US could lead to interoperability concerns or overly burdensome bureaucratic processes and regulations that lead to de-facto prevention of collaboration. Coordination is beneficial at this early stage to prevent unintentional impediments to collaboration.

The US and the EU should coordinate their data collection, sharing, use, re-use, access, and storage rules and standards as well as establish agreements that provide researchers access to data spaces and relevant datasets. Dialogue and alignment should focus on streamlining processes on both sides and ensuring consistent data standards so that beneficial joint research and analysis is easily initiated. This effort should likely be discussed during broader US-EU dialogues (Recommendation B1) and in parallel to joint AI R&D efforts (Recommendation B2) and while aligning future AI-related regulations (Recommendation C2).

Sub-recommendation: 1) If the US and the EU decide to pursue an open data agreement, the Digital Trade Chapter in the United States-Mexico-Canada (USMCA) Agreement could be used as a model as it includes strong open data protects, such as barring data localization, customs duties on digital products, and requirements to transfer computer source code and algorithms.⁴⁰⁹ 2) If the agreed approach is to focus on sector-specific datasets, it may be easiest to begin with the sectors that the EU’s High-Level Expert Group does not designate as “high-risk”. Such “low-risk”

409 Lambert, “Enhancing Transatlantic Cooperation on AI”; “United States-Mexico-Canada Trade Agreement Fact Sheet: Modernizing NAFTA into a 21st Century Trade Agreement” (Office of the United States Trade Representative, n.d.), <https://ustr.gov/trade-agreements/free-trade-agreements/united-states-mexico-canada-agreement/fact-sheets/modernizing>; “The Coming North American Digital Trade Zone” (Council on Foreign Relations, October 9, 2018), <https://www.cfr.org/blog/coming-north-american-digital-trade-zone>; Joshua New, “Here’s What the USMCA Does for Data Innovation” (Center for Data Innovation, October 5, 2018), <https://www.datainnovation.org/2018/10/heres-what-the-usmca-does-for-data-innovation/>.

sectors could be in environmental sciences (meteorological) or business sectors (manufacturing, retail).

Additional Considerations: Alignment of data standards will increase leverage of the US and the EU during multilateral standards and norms-setting negotiations. Additionally, enabling joint access to datasets is critical to enable important joint research; however, the US and the EU will need to independently address internal open data challenges (see next recommendation).

E2. Address Domestic Data Sharing Impediments to R&D

Rationale: There are still significant impediments to sharing data within sectors and between government, industry, and academia in the United States and the European Union. Enabling transatlantic data sharing requires these domestic impediments to be lessened.

The US and the EU should prioritize, where it is not already prioritized, increasing access to open data. Collaboration between the government, industry, and academia is likely necessary to address challenges. US-EU Dialogue (Recommendation B1) and sharing of best practices (Recommendation B3) can facilitate transatlantic learning that may decrease challenges of establishing data spaces and open datasets.

Additional Considerations: This is likely a precondition to enabling data sharing for joint R&D (Recommendation E1) and may pose a challenge to joint R&D (Recommendation B2).

E3. **Identify Countries' Comparative Advantage in the Supply Chain**

Rationale: As the US pushes for greater control over supply chains and decoupling from China, the US will examine and change aspects of supply chains for hardware necessary for AI. As the US is unlikely to be able to produce all hardware domestically, it will need to identify allied countries to relocate parts of production or provide primary or secondary sourcing of materials. The EU may also find it beneficial to identify alternative sources for certain AI-related hardware.

The US and the EU should work together to identify countries with a comparative advantage in producing and sourcing certain aspects of AI-related hardware and resources. Production may move to the US or EU Member States, or they may jointly identify like-minded allies (Recommendation A3) to relocate aspects of the supply chain.

Additional Considerations: At this moment, the EU seems less concerned as the US with changing their supply chains. Additionally, the US may still want certain critical aspects of production located in the US or in a country geographically close.

F. Healthcare

It is in humanity's interest for the best resources to be pooled together for the health and welfare of everyone. The authors started with this hypothesis in December and the recent COVID-19 pandemic has only strengthened our recommendation that the United States and the European Union work together on AI applications in healthcare. Given this belief, the authors have identified three recommendations to further health-related AI collaboration and address any potential obstacles to realizing this goal.

Recommendations

The recommendations are:

1. Focus on AI healthcare research related to pandemics on detection, diagnosis, and treatment.
2. Convene experts and policymakers to address legal and ethical obstacles.
3. Provide best practice for regulators.

The rationale and expanded recommendations are detailed on the following page.

F1. Focus AI Healthcare Research Related to Pandemics on Detection, Diagnosis, and Treatment

Rationale: COVID-19 highlighted the importance of international cooperation in addressing global health pandemics. Although there are many potential AI applications in this space, AI is particularly useful in detecting, diagnosing, and treating pandemics.⁴¹⁰

The US and the EU should explore, identify, and fund joint research and development projects, including the following potential focuses:

- **Detecting pandemics through natural language processing and social media scanning**
- **Diagnosing pandemics through research on few-shot learning and transfer learning⁴¹¹**
- **Treatment options through developing drug candidates (e.g., deep learning to generate novel drug candidates)⁴¹²**

Additional Considerations: DARPA's Pandemic Prevention Platform should be involved in these efforts. Countries should also consider working on agreements that facilitate real-time data on cases/diagnosis and hospitalizations during pandemics so that companies and researchers can conduct more reliable tracking and predicting of the pandemic's spread.

410 Will Douglas Heaven, "AI Could Help with the Next Pandemic--But Not With This One" (MIT Technology Review, March 12, 2020), <https://www.technologyreview.com/s/615351/ai-could-help-with-the-next-pandemicbut-not-with-this-one/>.

411 Few-shot learning requires small amounts of data and transfer learning enables AI to learn one application and be quickly adapted to execute a similar task. These are particularly useful during a pandemic when data may be limited. See: AI Could Help with the Next Pandemic -- But Not with this One, MIT Technology Review, March 12 2020, <https://www.technologyreview.com/s/615351/ai-could-help-with-the-next-pandemicbut-not-with-this-one/>

412 Heaven.

F2. Convene Experts and Policymakers to Address Legal and Ethical Obstacles

Rationale: As AI is increasingly used in healthcare, questions around how to properly weigh privacy concerns with improvements in health outcomes and public health safety continue to arise. These technical, legal, and ethical obstacles are compounded by diverging and even outdated regulation around healthcare data and privacy regulation. As already mentioned, the US and EU view regulation differently with the EU focusing on restricting companies' actions so as to protect citizens at the get-go, and the US taking a more laissez faire approach.⁴¹³ The US, using a sector-specific approach to data and privacy regulation, relies on the Health Insurance Portability and Accountability Act (HIPAA) to regulate the use of “protected health information” (PHI) by specific “covered entities,” which includes health care providers, health plans, health care clearinghouses, and “business associates” of these entities.⁴¹⁴ Conversely, the EU relies on General Data Protection Regulation (GDPR) for overall data regulation and is investigating classifying healthcare as a “high-risk” sector with additional regulatory burdens for AI applications. The international community, particularly in light of COVID-19, need to determine how to balance legal, ethical, and health considerations.

The US and the EU should convene healthcare experts, lawyers, ethicists, government officials, and other relevant experts to reflect on the challenges and opportunities for alignment that have arisen from AI applications in healthcare and COVID-19. The resulting body should investigate policy, technical, and legal/regulatory options to address obstacles to the research, development, and deployment of AI across the healthcare industry and across countries.

Additional Considerations: Other likeminded countries (e.g., Canada, UK, and Japan) should likely also be included. The group should also consider adapting healthcare privacy and general privacy laws (e.g., HIPAA, GDPR) to decrease the distance between the two approaches.

413 Renda, Senior Research Fellow and Head of Global Governance, Regulation, Innovation and the Digital Economy, Centre for European Policy Studies; Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

414 Stephen Mulligan, Wilson Freeman, and Chris Linebaugh, “Data Protection Law: An Overview” (Congressional Research Service, March 25, 2019), <https://fas.org/sgp/crs/misc/R45631.pdf>.

F3. Provide Best Practices for Regulators

Rationale: AI applications pose new challenges to regulators working within legal frameworks that are outdated and ill-equipped to guide oversight of emerging technologies. Regulators from like-minded nations can learn from their peers on novel approaches to ever-adapting challenges.

The US and the EU should establish a mechanism for regulators (FDA, EMA, other relevant government agencies) to share best practices on oversight of AI applications in healthcare.

Additional Considerations: *See Glenn Cohen's AI healthcare applications lifecycle.*

G. Environmental Sciences

Environmental sciences-related AI R&D should be prioritized to benefit the US, EU, and the world as well as strengthen AI-related research relationships to enable continued collaboration. Given this belief, the authors have identified two recommendations to further environmental sciences-related AI collaboration and address any potential obstacles to realizing this goal.

Recommendations

The recommendations are:

1. The U.S. should contribute research to the EU's Green New Deal.
2. Establish a joint funding mechanism for environmental sciences AI R&D.

The rationale and expanded recommendations are detailed on the following page.

G1. The US Should Contribute Research to the EU's Green New Deal

Rationale: The EU is reviewing its Green New Deal. As Professor of Theoretical Philosophy Thomas Metzinger explains, this review includes exploring how it can be used to restart the economy post-COVID-19, promote sustainable development, and increase innovation in emerging technologies like AI.⁴¹⁵

The US and the EU should explore, identify, and fund joint research and development projects, as part of the Green New Deal.

415 "A European Green New Deal" (European Commission, n.d.), https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en; Metzinger, Professor of Theoretical Philosophy at the Johannes Gutenberg University of Mainz.

Additional Considerations: This could build on existing deep STI relationships, particularly at NOAA, and could include other agencies such as DARPA, US DOE, USDA, US DOI, and NASA. This would likely be strengthened through the joint R&D recommendation (Recommendation B2), increase in US involvement in Horizon 2020 (Recommendation D1), building on existing US-EU government collaboration (Recommendation D3), and enabling data sharing for R&D (Recommendation E1).

G2. Establish a Joint Funding Mechanism for Environmental Sciences AI R&D

Rationale: US participants in Horizon 2020 health projects received EC funding automatically because of the reciprocity agreement with the US National Institutes of Health, National Science Foundation, and the Bill and Melinda Gates Foundation.⁴¹⁶ Research on environmental sciences, particularly climate related research, should be similarly prioritized.

The US and the EU should explore the creation and funding of a reciprocity agreement for certain environmental sciences research, either as part of Horizon 2020, Horizon Europe, or as a separate agreement.

Additional Considerations: This is related to our recommendation to increase US involvement in Horizon 2020 (Recommendation D1).

⁴¹⁶ BILAT 4.0, "EU-US STI COOPERATION PATTERNS—STATUS QUO" (European Union's Horizon 2020 Research and Innovation Programme, 2016), https://www.euussciencetechnology.eu/assets/content/Deliverables/BILAT_USA_4.0_Deliverable_2.1_Report_on_Status_quo_and_EU-US_STI_Cooperation_patterns_v1_forweb.pdf.

H. Defense

AI-related cooperation in the defense sector is key for the continuation of historical security alliances. The authors have identified four recommendations to further defense-related AI collaboration and address any potential obstacles to realizing this goal.

Recommendations

The recommendations are:

1. Shift the narrative away from lethal autonomous weapons (LAWs).
2. Relax restrictions on third-country funding, IP rights.
3. The US and the EU should strengthen their defense-related AI talent.
4. Increase efforts to share defense-related data.

The rationale and expanded recommendations are detailed on the following page.

H1. Shift the Narrative Away from Lethal Autonomous Weapons (LAWs)

Rationale: The narrative around the creation of “killer robots” and development of lethal autonomous weapons is causing tension between the European Union and the United States, according to Policy Fellow at the European Council on Foreign Relations Ulrike Esther Franke.⁴¹⁷ Although a discussion on the ethics and necessity of such technology should occur, the reality is this technology is not close to development and deployment, as Acting Director of the JAIC Nand Mulchandani explains, and the

⁴¹⁷ Franke, Policy Fellow at European Council on Foreign Relations.

friction around LAWS can prevent substantive discussion around the need for practical, present-day defense and security collaboration.⁴¹⁸

The US and the EU should work together to shift the conversation away from potential disagreement around LAWS and towards areas of necessary defense coordination. The US should work to quell the EU's fears around the timeline and reality of this technology and provide assurances that the US is domestically assessing the ethics around such weapons and willing to engage with European allies on these topics. The EU should correspondingly understand that a hyper-focus on this issue may prevent collaboration that could ultimately degrade Europe's defense capabilities and security.

Additional Considerations: The US takes the EU's concerns about military ethics seriously. The JAIC is trying to assuage concerns by hiring ethicists and lawyers, engaging in conversations around ethics, and accepting a Dutch military expert in AI as part of an exchange officer program.⁴¹⁹

H2. Relax Restrictions on Third-Country Funding, IP Rights

Rationale: The European Defense Fund (EDF) and corresponding Permanent Structured Cooperation (PESCO) have strict regulations on barring non-EU companies from owning intellectual property developed through research or receiving EDF funds. This disincentives US firms from partaking in vital research for global security and increasing Europe's defense capabilities. Although the EDF and PESCO are unlikely to be the main vehicles for US-EU defense collaboration, as Policy Fellow at the European Council on Foreign Relations Ulrike Esther Franke explains,⁴²⁰ the EU should be cognizant that similar restrictions may restrict more consequential defense collaboration.

418 Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

419 Mulchandani.

420 Franke, Policy Fellow at European Council on Foreign Relations.

The EU should consider reviewing and changing its EDF and PESCO regulations, allowing non-EU companies from receiving funds and maintaining IP rights in collaborative research projects. If changes are not made to EDF and PESCO, the EU and its Member States should consider not replicating similar restrictions on other defense-related R&D mechanisms for collaboration with the US.

H3. The US and the EU should Strengthen their Defense-Related AI Talent

Rationale: There are many defense and warfighting AI capabilities that must be developed. However, defense departments are struggling to attract and retain AI talent as the private sector is a lucrative, oftentimes easier, alternative.⁴²¹ This hinders defense departments ability to develop AI capabilities, which is compounded by the fact that, according to Acting Director of the JAIC Nand Mulchandani, the commercial sector is also not developing the needed technologies.⁴²²

The US and the EU should work together to pool their defense AI talent and pursue joint efforts to address this gap. These efforts could include: increased defense-related talent exchanges, talent exchanges/secondments into industry to strengthen AI literacy and skills, coordination on AI training and educational programs, and sharing of associated best practices.

H4. Increase Efforts to Share Defense-Related Data

Rationale: High-quality, diverse data, as Acting Director of the JAIC Nand Mulchandani explains, enables better training and development of algorithms and reliable AI. The defense-sector (NATO) would benefit from diverse data collected by many countries. It is difficult to reduce the timeline to properly collect, organize, store, and develop governance mechanisms around data. Therefore, Acting Director Mulchandani explains, it

⁴²¹ Mulchandani, Acting Director of the U.S. Department of Defense Joint Artificial Intelligence Center.

⁴²² Ibid.

is important for the US, the EU, and NATO to begin data-sharing efforts as soon as possible to prevent future obstacles.⁴²³ However, defense data-sharing efforts, as Ulrike Esther Franke explains, are difficult to initiate because of sensitivities around data, particularly around military operations. It may therefore be easier to establish data-sharing efforts centralized around solving a discrete question or achieving a specific goal.⁴²⁴

The US and the EU should remove obstacles to sharing defense and intelligence-related data where appropriate. They should also fund and prioritize addressing challenges to data sharing through NATO. Efforts should begin immediately as data sharing and governance projects are often lengthy undertakings. Projects focused on achieving a specific, concrete goal should lay the groundwork for larger-scale, general efforts.

423 Ibid.

424 Franke, Policy Fellow at European Council on Foreign Relations.

Appendix

CORDIS Table—H2020 AI projects with US participation

Project Acronym	Coordinator	Start-End	US Partner Name	Type of US collaboration	Type of US partner	Project Net EU Contribution	Project Net US Contribution	Thematic Priority	CORDIS Link
SYNTHEsys PLUS	UK	2019-2023	Smithsonian Institution	Participant	Non-profit	€ 10 000 000	€ 0	Research Infrastructures	https://cordis.europa.eu/project/id/823827
FORSEES	Italy	2019-2020	MIT	Partner	Academia	€ 251 003	€ 0	Marie-Sklodowska-Curie Actions	https://cordis.europa.eu/project/id/845064
PhilHumans	Netherlands	2019-2020	Philips Electronics North America corporation	Partner	Private sector	€ 2 135 436	€ 0	Marie-Sklodowska-Curie Actions	https://cordis.europa.eu/project/id/812882
NeuroDerisk	Austria	2019-2020	Fujifilm; Merck Sharp & Dohme	Participants	Private sector	€ 5 331 000	€ 457 966	Health, demographic change and wellbeing	https://cordis.europa.eu/project/id/821528
QUALITOP	France	2020-2023	General Hospital Corporation	Participants	Private sector	€ 5 196 773	€ 0	Health, demographic change and wellbeing	https://cordis.europa.eu/project/id/875171
MIREL	Luxembourg	2016-2019	Leland Standford Junior University	Partner	Academia	€ 1 152 000	€ 0	Marie-Sklodowska-Curie Actions	https://cordis.europa.eu/project/id/690974
MIDAS	UK	2016-2020	Arizona Boards of Regents	Participant	Academia	€ 4 533 863	€ 30 000	Health, demographic change and wellbeing	https://cordis.europa.eu/project/id/727721
ITRACK	Norway	2016-2019	Information Management and Mine Action Program	Participant	Non-profit	€ 3 999 214	€ 56 519	Secure societies - Protecting freedom and security of Europe and its citizens	https://cordis.europa.eu/project/id/700510
NanoSolveIT	Cyprus	2019-2023	University of North Carolina; University of California; Jackson State University; Duke University	Participant	Academia	€ 6 098 528	€ 0	Advanced materials	https://cordis.europa.eu/project/id/814572

Project Acronym	Coordinator	Start-End	US Partner Name	Type of US collaboration	Type of US partner	Project Net EU Contribution	Project Net US Contribution	Thematic Priority	CORDIS Link
EPA4TB	Spain	2020-2025	Bill & Melinda Gates Foundation; Global Alliance for TB drug development	Participant	Non-profit	€ 89 815 600	€ 0	Health, demographic change and wellbeing	https://cordis.europa.eu/project/id/853989
DESIREE	Spain	2016-2020	The Methodist Hospital Research Institute; University of Houston system	Participant	Academia	€ 3 340 720	€ 356 305	Health, demographic change and wellbeing	https://cordis.europa.eu/project/id/690238
AlforUTracking	Spain	2020-2022	Monterey Bay Aquarium Research Institute	Partner	Academia	€ 226 802	€ 0	Marie-Sklodowska-Curie Actions	https://cordis.europa.eu/project/id/893089
aID	Cyprus	2019-2023	Georgia tech	Partner	Academia	€ 1 587 000	€ 0	Marie-Sklodowska-Curie Actions	https://cordis.europa.eu/project/id/872139
AIDA	Belgium	2018-2021	Space Consulting International	Participant	Private sector	€ 1 499 690	€ 40 000	Space	https://cordis.europa.eu/project/id/776262
AGILE	Italy	2016-2018	IOTANGO INC	Participants	Private sector	€ 6 857 550	€ 0	Information and Communication Technologies	https://cordis.europa.eu/project/id/688088
devSAFARI	Sweden	2019-2022	University of California	Partner	Academia	€ 279 192	€ 0	Marie-Sklodowska-Curie Actions	https://cordis.europa.eu/project/id/839179



The Cyber Project

Belfer Center for Science and International Affairs
Harvard Kennedy School
79 JFK Street
Cambridge, MA 02138

www.belfercenter.org/Cyber