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Recommendations on Implementing Initial Findings and Recommendations of the National Artificial Intelligence Research Resource Task Force

Co-led by Daniel E. Ho, Jennifer King, Russell Wald, and Daniel Zhang

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JULY 2022

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ACKNOWLEDGMENTS

We thank Jeanina Casusi, Joe Hinman, Nancy King, Shana Lynch, Stacy Peña, and Michi Turner for their help in preparing this publication.

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On behalf of the Stanford Institute for Human-Centered Artificial Intelligence (HAI), we are pleased to see that a large majority of recommendations in the interim report aligned very closely with our white paper, "Building a National AI Research Resource: A Blueprint for the National Research Cloud." We concur with the recommendations on the selection of management entity (3-4), tiered model for access to and storage of federal agency datasets (4-9, 5-1, 5-2), leveraging existing federal data sharing plans to facilitate access to datasets (4-11), and ensuring that NAIRR resources are allocated to specifically support research on AI trustworthiness (6-4).

We write to provide some additional feedback on specific recommendations for consideration in response to the Request for Information (RFI) by the National Science Foundation and the White House Office of Science and Technology on Implementing Initial Findings and Recommendations of the National Artificial Intelligence Research Resource Task Force.

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Recommendation 2-6: While introducing commercial access to NAIRR for researchers at small businesses and private companies may very well benefit national AI innovation, we emphasize that the area of most acute need is for scientific research, particularly in higher education, and that an industry-oriented NAIRR poses substantial challenges. We recommend the Task Force limit access to NAIRR to researchers at U.S. higher education institutions during the first three years of a pilot run.

First, it is unclear how including small businesses and private companies meets the strategic objective of NAIRR. While we concur with the interim report that the mission of NAIRR is to expand and democratize access to AI R&D resources across the United States, it is important to provide ample infrastructure for basic scientific research which is a substantially under-resourced area in comparison to commercial research. As we noted in Chapter 1 of our white paper, the commercial sector is not part of the U.S. AI innovation system that is currently facing the structural challenges of lacking access to compute and data resources as well as the loss of AI talent.[1] Second, establishing NAIRR will be a complex and resource-intensive process. Introducing commercial access to NAIRR for small businesses and private companies that receive federal grants at launch may introduce a variety of regulatory and logistical challenges in the short term, further complicating and delaying the launch. For example, there are 31.7 million small businesses in the United States and federal agencies distribute on average 5,000-7,000 awards per year via the Small Business Innovation Research (SBIR) and Small Business

[1] Daniel E. Ho et al., *Building a National AI Research Resource: A Blueprint for the National Research Cloud* (Stanford Institute for Human-Centered Artificial Intelligence, Stanford University, October 2021), https://hai.stanford.edu/sites/default/files/2022-01/HAI_NRCR_v17.pdf.

Technology Transfer (STTR) programs.[2] Opening up NAIRR access to those startups and other private sector researchers doing research that is in the "public interest" raises a wide range of boundary questions that NAIRR may be ill-equipped to adjudicate. Alternatively, the Task Force could consider extending subsidized loans to small businesses or private companies via other federal agencies outside NAIRR's jurisdiction for purchasing computing resources to advance AI R&D.

Expanding NAIRR access to nonprofit organizations, federal agencies, or federally funded research and development centers (FFRDCs), as the interim report recommended, may be a more reasonable consideration and closer to the core of NAIRR's mission. The Task Force could consider focusing on academic researchers as a starting point as it illuminates some of the main operational considerations for NAIRR access and adopts a broader access model in the long term.

Recommendation 4-12: We recommend the Task Force adopt a dual investment strategy with regard to computing infrastructure by developing programs for expanding access to existing commercial cloud services and building a high-performance computing (HPC) infrastructure to provide publicly owned resources. In the short run, scaling up cloud credit programs, using commercial cloud services (similar to NSF's CloudBank program), provides numerous efficiency advantages. In the long run, our research shows that it is more cost-effective to own infrastructure when computing demand is close to continuous.[3]

Recommendation 3-10 & 6-2: For the proposal review and ethics review of researchers requesting NAIRR access, we recommend the Task Force adopt a tiered model. Researchers should gain access to base-level compute and data access by default and then apply through a streamlined process to gain access at resources beyond the base level on a project-specific base. A case-by-case, manual review for every single request for resource access, whether data or compute, would be an onerous process that balloon administrative overhead. Additionally, when researchers are simply applying for access, the research may be at an early stage without much to review.

For the ethics review specifically, researchers requesting beyond base-level compute should also be required to submit ethics impact statements with research proposals as part of the application. Existing mechanisms commonly used to assess academic research involving human subjects, such as institutional review boards, are ill-equipped to examine AI-related research as the research may not involve human subjects or rely on existing, publicly available data (not collected by the proposers) about people. In the meantime, the Task Force should consider establishing an ex post process to handle complaints about unethical research conduct or outputs.

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[2] "SBIR/STTR award data," https://www.sbir.gov/sbirsearch/award/all/.
[3] Preston Smith et al., "Community Clusters or the Cloud: Continuing Cost Assessment of On-Premises and Cloud HPC in Higher Education," *Proceedings of the Practice and Experience in Advanced Research Computing on Rise of the Machines* (July 2019): 1-4, https://doi.org/10.1145/3332186.3333155.

As lead authors, we proudly submit this response on behalf of our colleagues and the Stanford Institute for Human-Centered Artificial Intelligence (HAI).

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