

PUBLIC SUBMISSION

Received: May 29, 2025 Tracking No. mb9-gtk7-fil0 Comments Due: May 28, 2025 Submission Type: Web
--

Docket: NSF-2025-OGC-0001
NITRD_FRDOC_0001

Comment On: NSF-2025-OGC-0001-0001
Request for Information: Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan

Document: NSF-2025-OGC-0001-DRAFT-0183
Comment on FR Doc # 2025-07332

Submitter Information

Government Agency Type: State
Government Agency: University of North Carolina at Chapel Hill

General Comment

Please see the attachment for a response to this RFI from the University of North Carolina at Chapel Hill.

Attachments

UNC Response to RFI on the 2025 National Artificial Intelligence (AI) Research Resource

May 29, 2025

312 SOUTH BUILDING
CAMPUS BOX 4000
CHAPEL HILL, NC 27599-4000T 919.962.1319
F 919.962.1476
<http://research.unc.edu>

This document is approved for public dissemination. The document contains no business-proprietary or confidential information. Document contents may be reused by the government in developing the 2025 National AI R&D Strategic Plan and associated documents without attribution.

I. Executive Summary

To support and advance the goals of the **National Artificial Intelligence Research and Development Strategic Plan**, the **University of North Carolina (UNC) system**—including its flagship campus at Chapel Hill—stands ready to contribute through its deep expertise, collaborative research culture, and longstanding commitment to public service. UNC’s pan-campus initiatives such as **RENCI**, the **AI Acceleration Program**, the **School of Data Science and Society**, the **Carolina Health Informatics Program (CHIP)**, the **Bioinformatics & Computational Biology Program**, and **National Consortium for Data Science** exemplify how public research universities can drive innovation and national impact through interdisciplinary collaboration.

As a leader in fields ranging from **biomedical and health sciences**, **geospatial modeling**, and **social and behavioral science**, to **information and library science**, **public policy**, and **law**, UNC brings comprehensive capabilities to bear in shaping the future of ethical, inclusive, and high-impact AI.

We recommend targeted federal investments in the following priority areas, where UNC and its partners are well-positioned to deliver national benefit:

- **Advance AI innovation in high-impact domains** such as genomics, public health, environmental resilience, materials science, robotic chemistry & automation, and cybersecurity. UNC researchers are advancing AI in cancer detection, pandemic modeling, climate change adaptation, and more—applying AI to real-world challenges with broad public benefit.
- **Strengthen the national research infrastructure** to support open, transparent, and reproducible AI development. UNC’s leadership in building scalable data platforms, secure computing environments, and FAIR-compliant data systems provides a strong foundation for national-scale collaboration.

- **Promote broad participation in AI R&D by enabling access and engagement across disciplines, geographic regions, and communities.** Through programs that connect rural communities, work with emerging innovation hubs, and partner with institutions across North Carolina and the Southeast, UNC helps ensure AI opportunities are not limited to coastal or urban centers.
- **Bolster national security and economic competitiveness** by contributing to the development of robust, auditable, and mission-critical AI systems. UNC researchers in computer science, information science, environmental science, social science and public health are advancing secure AI for emergency response, misinformation mitigation, and critical infrastructure protection.
- **Ensure equitable access to high-quality, AI-ready data and scalable compute resources** by supporting research universities as trusted data stewards and innovation engines. UNC's expertise in biomedical informatics, population health, and data ethics makes it a model for how academic institutions can manage sensitive, diverse, and mission-critical datasets for national use.
- **Drive interdisciplinary research that embeds ethics, policy, and human-centered design into AI innovation.** UNC's schools of law, information science, and public policy lead research on algorithmic accountability, legal frameworks for emerging technologies, and public engagement—ensuring AI development aligns with democratic values and societal needs.
- **Prepare the AI-ready workforce of the future** by advancing interdisciplinary research on human-AI symbiosis and developing the technical, analytical, and human-centered skills needed for responsible AI use in the future of work. Through innovative curricula and applied research, UNC equips next generations with AI literacies and scenario-based competencies to collaborate effectively with AI systems, tailored to specific contexts of application, such as knowledge-intensive professions, clinical decision-making, and policy analysis.

In sum, UNC exemplifies how a major public research university can contribute to the nation's AI leadership—through groundbreaking research, a collaborative and service-oriented culture, and a strong commitment to ensuring that AI advances benefit all Americans.

II. Introduction

UNC is home to a vibrant, interdisciplinary AI research ecosystem. With strengths in data science, public health, future of work, law and policy, environmental modeling, and social equity, UNC fosters AI innovation that advances both scientific discovery and societal

good. Our initiatives—such as the Odum Institute, the School of Data Science and Society, and RENCI—exemplify how research universities can serve as engines of impactful, scalable AI solutions.

III. Suggestions to Revisions to the National Artificial Intelligence Research and Development Strategic Plan (2023 Update)

1. Emphasize Federated, Interoperable AI Infrastructure for National-Scale Research

Addition to Strategy 1 & 5

Justification:

UNC has a strong legacy of leading cross-institutional data infrastructure projects, including the NSF FABRIC, NIH BioData Catalyst, Biomedical Data Translator, the iRODS Consortium, and National Consortium for Data Science. These initiatives showcase how academic research hubs can build federated systems that balance openness with privacy protections and enable national collaboration in sensitive domains like health, environment, and cybersecurity.

Recommendations:

- Invest in **federated research infrastructure** that connects AI researchers across institutions via interoperable platforms, secure data enclaves, and standardized protocols.
- Establish **regional university-led testbeds**, like those at UNC, that include cloud-native and on-premises, high-performance, and edge-computing capabilities to support both urban and rural researchers.
- Enable **reproducibility and data sharing** through federal support for infrastructure that prioritizes open formats, provenance, version control, and data citation.
- Fund **long-term stewardship of AI research infrastructure** housed at research universities to ensure sustainability and public accessibility, as well as training data and AI stewards that provide the necessary workforce to enable the AI transition.

2. Advance AI in Scientific Discovery and Translational Research

Addition to Strategy 1 & 8

Justification:

UNC researchers apply AI to high-impact domains like genomics, cancer, infectious diseases, and climate science—translating basic research into improved health outcomes and environmental resilience. As a major NIH and NSF grantee, UNC has deep experience in managing translational pipelines and connecting AI with domain expertise.

Recommendations:

- Expand federal support for **domain-specific AI innovation** through cross-agency programs in biomedicine, environmental science, technology development, implementation science and social science.
- Fund **AI-powered translational research centers** at research universities to bridge the gap between discovery and application in areas like public health and sustainability.
- Incentivize the integration of **high-throughput data generation technologies, HPC, workflow automation, and data governance** into AI-driven discovery pipelines to improve efficiency and accountability.
- Foster **multi-institutional partnerships** among universities, national labs, and community-based organizations to advance responsible AI deployment in the public interest.

3. Strengthen AI Governance, Ethics, and Trust Frameworks Based on Social Science Research

Addition to Strategy 3**Justification:**

UNC's nationally ranked schools of public policy, law, and information science are leaders in studying AI's social implications. Our interdisciplinary faculty examine fairness, algorithmic accountability, regulatory design, and public trust—essential pillars of responsible AI development.

Recommendations:

- Establish **AI ethics research centers** at universities to produce empirical studies that guide federal standards and governance practices.
- Support **regulatory sandboxes and policy labs** to test innovative accountability models in partnership with public agencies.
- Promote **community-based engagement and participatory AI design** to ensure that public values shape AI development.

- Fund **cross-sector fellowships and training programs** that embed social scientists within AI R&D projects and federal agencies.

4. Accelerate Workforce Development Through AI Apprenticeships and Regional Hubs

Addition to Strategy 7

Justification:

UNC is deeply engaged in workforce development, from undergraduate AI and data science programs to rural STEM outreach and partnerships with industry. The National Consortium for Data Science initiative and the UNC School of Data Science and Society are building a diverse pipeline of AI talent across the Southeast.

Recommendations:

- Create **regional AI workforce hubs** led by research universities like UNC that collaborate with community colleges, innovation hubs, and industry partners.
- Fund **AI apprenticeships and co-op programs** that allow students to gain applied experience at national labs, non-profits, and industry partners.
- Expand **K–12 outreach and educator training** to build AI literacy in underserved communities, leveraging university extension networks.
- Support **career transition programs** for mid-career professionals, including veterans and displaced workers, into AI and data science fields.

5. Develop Secure, Auditable, and Mission-Critical AI Systems for Security and Privacy Protection

Addition to Strategy 4

Justification:

UNC researchers lead federally funded projects in cybersecurity, health data privacy, and critical infrastructure resilience. Our work spans algorithmic robustness, human-in-the-loop security, and adversarial threat detection—foundational capabilities for building trustworthy, mission-critical AI.

Recommendations:

- Prioritize R&D for **secure-by-design AI systems** that operate under regulatory constraints in healthcare, energy, finance, transportation, and defense.

- Invest in **university-led testbeds** for adversarial AI, misinformation mitigation, and autonomous systems validation.
- Fund **auditability tools and algorithmic monitoring platforms** that provide transparency and explainability in high-stakes decision systems.
- Encourage **cross-sector coalitions** that include academia, public safety agencies, and private-sector partners to co-design resilient AI systems.

6. Enhance Coordination and Evaluation Through AI Research Networks

Addition to Strategy 9

Justification:

UNC has decades of experience leading collaborative research networks and data ecosystems, such as the Clinical and Translational Science Award (CTSA) program and the North Carolina Collaboratory. Our campus-wide AI and data science initiatives can serve as nodes in a national coordination network.

Recommendations:

- Establish a **National AI Research Coordination Network (AI-RCN)** that connects academic institutions, federal labs, and regional consortia.
- Support **governance models and shared services** to ensure interoperability, sustainability, and inclusivity across institutions.
- Enable **cross-institutional data and workforce mobility** through harmonized policies on data access, funding, and training.
- Use this network to disseminate **best practices in AI reproducibility, ethics, and community engagement**.

7. Invest in Curated, Accessible, and AI-Ready Data Ecosystems

Addition to Strategies 1, 5, and 6

Justification:

A central limitation in the advancement of trustworthy, equitable, and impactful AI is the lack of high-quality, curated, and AI-ready data across critical domains. UNC and RENCi have led national-scale initiatives in data management and infrastructure (e.g., NIH's BioData Catalyst, NSF's Open Knowledge Network, the National Consortium for Data Science, and partnerships in FAIR data stewardship, including the iRODS Consortium). These efforts have demonstrated the value of data pipelines that enable responsible reuse, documentation, interoperability, and reproducibility—hallmarks of impactful AI research.

Recommendation:

- **Fund the development and maintenance of domain-specific, AI-ready data corpora** that include both structured and unstructured datasets (e.g., clinical, chemical, climate, geospatial, and social determinants data), with embedded metadata, provenance tracking, and usage documentation.
- **Support national repositories and data trust frameworks** that incentivize data sharing from academia, industry, and public agencies, while protecting privacy and respecting governance norms.
- **Standardize and enforce FAIR (Findable, Accessible, Interoperable, Reusable) and FACT (Fair, Accurate, Confidential, Transparent) principles** in datasets used for AI model development—especially in health, criminal justice, and environmental equity domains.
- **Incentivize “data stewardship as infrastructure”** by funding roles and tools at universities and research centers that ensure long-term usability and curation of datasets beyond the life of individual grants.
- **Create funding streams for data annotation, harmonization, and validation**, particularly for underserved domains and communities that are underrepresented in mainstream AI research.
- **Ensure datasets are inclusive and representative**, with mechanisms for continuous auditing to mitigate bias and expand generalizability.

IV. Conclusion

UNC integrates top-tier research in AI, health sciences, environment, public policy, and ethics. Its interdisciplinary culture and collaborative infrastructure (e.g., National Consortium for Data Science, Odum Institute, iRODS Consortium) position it to drive innovation in AI for social good. UNC is committed to equitable AI through educational access, rural engagement, and research on fairness and trust. UNC welcomes the opportunity to pilot national initiatives or serve as a coordinating node for federal AI programs.

Penny Gordon-Larsen
Vice Chancellor for Research