NASA Compliance Plan for OMB Memorandum M-24-10

September 23, 2024

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Strengthening Artificial Intelligence (AI) Governance

General

NASA is committed to advancing leadership in artificial intelligence and intends to maximize AI value to the Agency while managing AI risk. NASA is taking steps to expand the use of artificial intelligence and machine learning to amplify productivity and increase capabilities. Agency leaders and AI practitioners are actively contributing to plans for AI adoption and governance which is providing NASA with an excellent foundation for safe, secure, responsible, and rights-respecting AI use across the agency. NASA will publish or update policy directives and requirements to include the roles and responsibilities of the Chief AI Officer. The policy updates will ensure consistency with OMB M-24-10. NASA intends to meet Federal deadlines from EO 14110, OMB M-24-10, and AI Inventory instructions.

AI Governance Bodies

NASA has established a governing board within the agency to serve as a forum for senior leaders to drive AI adoption and governance for NASA. The Artificial Intelligence Strategy Board (AISB) is responsible for defining the vision and strategy for AI, promoting AI adoption and innovation, establishing AI policy and procedural guardrails, identifying AI risk mitigation practices across the Agency, as well as monitoring NASA compliance with Federal guidelines. The AISB membership is shown in Appendix A.1 and may be evolve as changes occur or NASA AI governance matures. AISB's specific functions are to:

   a. Review and approve a NASA AI Strategy to harness the mission value of AI while assuring responsible and ethical use.
   b. Monitor NASA progress and accomplishment of objectives with NASA's AI Strategy.
   c. Facilitate Agency-wide consensus on NASA AI policies to allow adaptation to a rapidly changing AI landscape while remaining aligned with mission priorities.
   d. Review the NASA AI use case registration process and approve Agency submissions to the annual AI reporting requirements and compliance actions required by OMB.
   e. Review safety and rights impacting AI-use case assessments and waiver procedures and monitor overall AI risk mitigation procedures.
   f. Issue actions for NASA's continued AI success and remove barriers to responsible use of AI and to advance AI innovation.
   g. Make recommendations to the Mission Support Council (MSC) on NASA-wide impacts.

The AI Strategy Board will provide senior leadership level emphasis for AI, actively guiding NASA AI adoption, investment, and responsible use.

The Agency has also created the Artificial Intelligence Strategic Working Group (AISWG) to advise and serve the AISB. The AISWG consists of NASA personnel selected to provide key insights into the use of AI and appropriate governance for the Agency.

The AISWG is responsible for:

a. Forming topics of discussion for the AISB regarding implications of AI within the Agency.
b. Supporting AI Governance creation within the Agency.
c. Providing recommendations to the CAIO in relevant matters.
d. Coordinating with practitioners to understand AI work at NASA.
e. Advocating for AI plans and strategies.
f. Reviewing and providing feedback for NASA AI Strategy to harness the mission value of AI and assure responsible and ethical use.
g. Defining and advancing strategic objectives.
h. Drafting, establishing, and maintaining AI policies that addresses the implications of the rapidly changing AI landscape.
i. Developing an inventory of AI use at NASA including the annual process for registering AI use cases as they are developed, tested, operationalized, and retired.
j. Creating a process for reviewing and approving safety and rights impacting assessment and waiver procedures and managing overall risk.
k. Identifying and removing barriers to the responsible use of AI and advancing responsible AI innovation.

NASA will also consult with external organizations in a variety of mechanisms. NASA participates in cross-Federal forums for AI, such as the Chief AI Officers' Council. NASA also participates in industry and academic symposia where emergent AI techniques, best practices and risks are discussed. NASA Mission Directorates engage with their respective public communities. For example, the Science Mission Directorate works across the broad, open science community which includes industry, academia, other nations, and the public. NASA will also continue to leverage external consulting firms for advice on technical advancements and procedural approaches to responsibly adopt and use AI throughout NASA.

AI Use Case Inventories

NASA will update its AI inventory to meet FY24 instructions and to facilitate internal awareness and management of AI use within NASA. The AISB will oversee collection of AI inventory data for FY24 and subsequent years.

NASA is updating prior inventory data structures, collection mechanisms, and query / visualization capabilities to form an AI registry which will provide the data required for the federal AI inventory. The AI registry will inform AI governance, planning, and connect NASA AI practitioners with one another to promote awareness and re-use. All prior use cases will be loaded into the new AI registry and use case points of contact will be required to update their entries. If use cases have expired, they will be archived instead of deleted. If points of contact have changed, the inventory will allow for an update.

Reporting on AI Use Cases Not Subject to Inventory

NASA's AI registry will encourage NASA-internal collection, visibility, and tracking of AI use cases not reportable to the Federal level. The NASA AI Registry and supporting governance procedures provide a continuous and enduring process to capture AI use and track it through its lifecycle. Along with updates at any time, NASA will emphasize use case updates or validation aligned with yearly Federal inventory deadlines.

The planned update cycle will support re-assessing previously non-reportable use cases to evaluate if reporting criteria have changed, such as maturity of the AI, addition of safety- or rights-impacting elements, etc. It will also allow NASA to address any changes to annual reporting requirements.

Advancing Responsible AI Innovation

AI Strategy

NASA will publish an AI strategy that addresses the areas in M-24-10, section 4.a by March 2025.

Removing Barriers to the Responsible Use of AI

NASA has identified several barriers to AI adoption and has begun taking action to resolve them. Barriers include access to AI tools and platforms, the need to make data AI-ready, and quality control issues with generative AI outputs.
1. For AI tools and platforms, NASA intends, within budget limitations, to make multiple cloud-hosted AI capabilities available in FY25. NASA is also working to authorize AI upgrades to common, off-the-shelf software, such as office automation tools, to include streamlining technology onboarding processes.
2. For making data AI-ready, NASA Digital Transformation is conducting a series of facilitated AI workshops with NASA organizations. These workshops seek to envision the latest transformation goals, highlight AI ambitions, and identify data enhancements required to fuel transformation with data and AI. In preparation for broader use of AI, better understanding the characteristics of AI-ready data has continued to be an area of focus for the Enterprise Data Working Group (EDWG).
3. For quality control of AI outputs, NASA will augment standard engineering, system engineering processes, and software engineering with additional AI considerations. Human verification and validation, as well as science evaluation and benchmarks, are being strongly emphasized, especially with generative AI.
4. The NASA Chief Information Officer issued initial guidance for use of generative AI in May 2023, which was distributed via an email to all NASA employees, posted on the CIO's internal web space, and is actively referenced by AI leaders in advising generative AI adopters. The CAIO is overseeing an update of the generative AI guidance in Fall 2024 based on additional developments in AI capabilities and Federal guidance. As specific topics related to responsible AI use emerge, the CAIO is postured to issue interim policy memorandums to address concerns and mitigate risk.

AI Talent

NASA's existing workforce is highly technical, and includes personnel with deep expertise in traditional AI, machine learning, software development, statistics, data science, modeling, simulation, high performance computing, robotics, autonomy, and more. NASA encourages up-skilling, which helps the previously mentioned personnel continue to grow and allows additional workers to learn new AI skills. NASA steadily increased AI-specific training from 2020 to 2023 and launched the "Summer of AI" learning campaign in 2024 reaching nearly 4,000 unique learners over a 90-day period. Encouraged by the Office of Personnel Management (OPM), NASA has begun using the OPM 1560 Data Scientist Series positions and leverages many creative mechanisms to acquire cutting-edge talent, such as direct hires, federally funded research and development contractors, university grants, industry partnerships, internships, fellowships, and military transition opportunities. NASA will continue to evaluate the learning needs of its workforce and provide training across multiple disciplines at all levels to address the rapidly evolving AI landscape and to assure responsible adoption and compliance with executive orders and OMB memorandums.

AI Sharing and Collaboration

NASA plans to share custom-developed AI code, models, model weights, and other artifacts, as-appropriate, while balancing its open science policies with the need to protect certain products for safety, rights, security, or protection of industry-proprietary intellectual property. NASA's AI inventory will report links to relevant shared repositories. NASA will advocate for and encourage open sharing via multiple methods, such as posting public recognition or sponsoring open sharing events. Organizations across NASA already conduct widespread external engagement, to include sharing relevant code and data, as well as eliciting external partner contributions via grants, crowdsource campaigns, and more. NASA plans to continue these engagements, expanding to include AI topics, where relevant.

Harmonization of Artificial Intelligence Requirements

NASA has multiple mechanisms to help document and share best practices for AI governance, innovation, and risk management. These include existing engineering, safety, and risk bodies with decades of practical AI experience to newly formed AI governance structures:

1. The CAIO is establishing AI governance in two tiers: senior leaders of NASA will guide NASA's approach to AI and subordinate leaders will maximize NASA's value from AI while managing risks. These two AI leadership bodies are the core of NASA's new structures to advance AI. These bodies span NASA by design and will encourage widespread collaboration. New AI governance bodies are integrated with existing program management and technical authority structures in place at NASA.
2. NASA's Autonomous Systems System Capability Leadership Team (AS-SLCT) includes many deep AI experts who have been using AI for decades to fuel autonomy in Mission-embedded work, such as rovers on Mars. This team actively shares lessons and best

practices among the members and beyond. NASA continues to leverage existing standards, policies, and procedures like the Autonomous Systems Classification Framework to help guide AI and inform AI quality control measurers as well as verification and validation testing.

3. NASA's Digital Transformation initiative includes an AI and Machine Learning (ML) facet, which has built a robust community of AI and ML adopters who actively share techniques, lessons, and training. The community also includes an AI/ML consultation team with a portal site that matches expertise seekers with AI experts.

4. NASA also participates in the Chief AI Officers' Council, and three sub-teams, to learn from other Federal agencies, and to contribute insights.

Managing Risks from the Use of Artificial Intelligence

Determining Which Artificial Intelligence Is Presumed to Be Safety-Impacting or Rights-Impacting

NASA plans to use the AI definitions from NASA Policy Directive (NPD) documents, NASA Procedure Requirement (NPR) documents, NASA standards, EO14110, OMB M-24-10, and the draft AI Inventory Instructions to 1) assess if a use case meets the definition for AI, and 2) meets the definitions for either safety- or rights- impacts. The CAIO team and AISWG will promulgate these definitions, along with examples from Federal directives and NASA. In concert with existing NPRs, NASA will utilize existing internal policies and empower organizational leaders and their AI-using Subject Matter Experts (SMEs) to serve as the first tier of assessment whether a use case meets safety- or rights- impacting definitions. The CAIO team and governance bodies will track and check organizational / SME assessments and will help make judgements if categorization is unclear for some use cases.

NASA will continue to conduct workshops among AI use case owners, AI leaders in various NASA organizations, Chief AI Officer team members, organizations such as the Office of Safety and Mission Assurance (OSMA), and other stakeholders to work through safety- and rights-impacting use case actions and reporting. If a use case requires a waiver, that team will work together to author a waiver, a different sub-team will provide an independent review, the CAIO will provide a review, and the CAIO will team with other approval authorities (e.g., Safety & Mission Assurance, Chief Engineer) to take the appropriate action on the waiver. The CAIO team will maintain a list of waivers and will track them in similar fashion to NASA's processes for tracking actions, audits, etc.

Implementation of Risk Management Practices and Termination of Non-Compliant AI

NASA takes risk management across all mission and support functions very seriously. As such, NASA has extremely robust risk management measures that have evolved and have been refined for decades. These measures are well documented in policies and overseen by risk management boards and NASA Technical Authorities. For AI use cases that may be publicly deployed, NASA will leverage existing quality control and risk management processes to assure all AI use is compliant with OMB M-24-10 and other guidelines.

NASA plans to approach safety- and rights- impacting compliance from a perspective of assisting NASA AI users in accomplishing their mission goals while aligning with relevant best practices. NASA's intent is to either help safety- and rights- impacting AI use cases achieve compliance with a plan of action and milestones approach, evaluate the mission impact of retirement, or consider granting a waiver if necessary. Directing AI practitioners to cease use of non-compliant AI is seen as a last resort, but if that last resort becomes necessary, it can be escalated through the AI governance process to the Deputy Administrator.

Minimum Risk Management Practices

NASA plans to document and validate implementation of additional AI risk management process in accordance with the Federal instruction in combination with existing NASA quality control processes and policies for engineering, system engineering, software development, and information technology authority to operate determinations. Existing policies and processes provide the foundation and will undergo continuous assessment so they may be evolved to address emerging risks. The AI Registry enables a perpetual update process of AI use-case information that is reportable to the AISB and AISWG. As such the AI Governance, Risk Management Boards and Technical Authorities will have the necessary awareness of emergent risks along with the authority to take action to address and mitigate those risks.

Appendix

A. 1 AISB membership

a. Chair: Deputy Administrator (DA)
b. Alternate Chair: Chief AI Officer (CAIO)
c. Officers in Charge (OICs) or deputy OICs from each Mission Directorate or senior designee
d. Mission Support
   1. Office of the Chief Information Officer
   2. Office of the Chief Financial Officer
   3. Office of Diversity and Equal Opportunity
   4. Office of General Counsel
   5. Office of Chief Human Capital Officer
   6. Office of Procurement
e. Headquarters Technical Authorities
   1. Office of Safety and Mission Assurance
   2. Office of the Chief Engineer
   3. Office of the Chief Scientist
   4. Office of Technology, Policy and Strategy
   5. Office of the Chief Health and Medical Office