

Generative AI Usage Toolkit

Introduction

Welcome to the NIH Library’s GenAI Usage Toolkit, a comprehensive guide designed to help you effectively and ethically integrate generative AI tools into your workflows. This toolkit provides a structured approach to evaluating, implementing, and verifying the use of AI in various tasks, ensuring that you can harness the power of AI while maintaining high standards of accuracy, transparency, and accountability.

This toolkit is designed to be a practical resource for researchers, professionals, and teams seeking to leverage AI tools responsibly. By following the guidelines and using the provided worksheets and checklists, you can make informed decisions about AI use, enhance the quality of your work, and uphold ethical standards in your AI applications.

We hope you find this toolkit valuable and empowering as you explore the potential of generative AI in your work.

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Executive Summary

The NIH Library Generative AI Usage Toolkit is a comprehensive resource designed to guide NIH staff and affiliates in the responsible and effective use of generative AI tools. This toolkit addresses the growing need for clear guidelines in AI implementation within research and administrative workflows.

Key components of the toolkit include:

1. **NIH-Wide AI Policies and IC-Specific Guidance:** Provides an overview of general NIH policies on AI use and emphasizes the importance of consulting and adhering to individual Institute and Center (IC) guidelines, which may have additional or more specific requirements.
2. **Task Appropriateness Checklist:** Helps users determine if a task is suitable for AI application.
3. **AI Application Assessment Matrix:** Guides the evaluation of potential AI applications, considering risk levels, boundaries, transparency, and monitoring needs.
4. **AI Output Verification Methods:** Outlines various approaches to verify and validate AI-generated content.
5. **Documentation and Attribution Guidelines:** Provides frameworks for properly documenting AI use and attributing AI-generated content.

This toolkit aims to empower NIH personnel to:

- Identify appropriate use cases for generative AI
- Implement AI tools responsibly and ethically
- Maintain high standards of accuracy and transparency
- Comply with relevant institutional policies and guidelines

By following the structured approach outlined in this toolkit, users can harness the potential of AI while upholding the rigorous standards expected in NIH's scientific and administrative processes.

Important Note

While this toolkit provides general guidance, it does not supersede or replace policies set by individual NIH Institutes and Centers. Users must consult and follow the specific AI usage policies and guidelines of their respective IC. The toolkit should be used in conjunction with, not in place of, IC-specific guidance.

AI Policies at NIH and IC-Specific Guidance

NIH-Wide AI Policies and Resources

[AI Guidance - Foundational Information, Generative AI, and Risks](#)

- Provides foundational information on AI, including definitions, key concepts, and the scope of AI technologies.
- Addresses specific risks associated with generative AI, such as data privacy concerns, potential biases, and ethical considerations.
- Offers recommendations for mitigating these risks.

[The Use of Generative Artificial Intelligence Technologies is Prohibited for the NIH Peer Review Process](#)

- Explicitly prohibits the use of generative AI technologies in the NIH peer review process.
- Ensures the integrity and objectivity of peer review by preventing potential biases or manipulations from AI-generated content.

[Artificial Intelligence in Research: Policy Considerations and Guidance](#)

- A new resource issued by the Office of Science Policy (OSP) to help the research community understand how NIH policies guide AI-related research.
- Illustrates the applicability of existing policies and guidance to research involving AI technologies.

Related Federal Policies

[HHS: Artificial Intelligence at HHS - Statutes and Authorities](#)

- Outlines the legal framework, statutes, and authorities governing AI use at the Department of Health and Human Services (HHS).
- Details the relevant laws, regulations, and policies that HHS must adhere to when deploying AI technologies.

[OPM: Responsible Use of Generative Artificial Intelligence for the Federal Workforce](#)

- Provides guidelines for the responsible use of generative AI by the federal workforce.
- Emphasizes ethical considerations, data privacy, transparency, and accountability in developing and deploying generative AI tools within federal agencies.

IC-Specific Guidance

While this toolkit offers general guidance on the use of generative AI, each NIH Institute and Center (IC) may have its own specific policies and guidelines. These IC-specific policies may be more restrictive or include additional requirements beyond what is outlined in this general toolkit.

Task Appropriateness Checklist for AI Use

Introduction: This worksheet will help you assess which tasks in your workflow are suitable for the application of generative AI tools. By identifying appropriate use cases, you can ensure that AI is utilized effectively and ethically within your specific research or work context. Use this checklist to evaluate tasks and make informed decisions about integrating AI into your processes.

Circle one

1. Is the task primarily one of the following?

- Information retrieval or summarization
- Data analysis or pattern recognition
- Content generation or ideation
- Language translation or paraphrasing

Yes No

STOP! If you selected No, generative AI might not be suitable for this task.

2. Does the task require any of the following?

- Deep subject matter expertise
- Critical analysis of recent or specialized research
- Ethical decision-making

Yes No

If you selected yes, ensure human expertise leads the process.

3. Will the output be used for any of the following?

- Public publication or sharing
- Critical decision-making
- Incorporation into official reports or papers

Yes No

If you selected yes, implement a robust review process.

4. Can you clearly define the inputs and desired outputs for this task?

Yes No

5. Do you have the means to verify the AI's output?

Yes No

6. Is using AI for this task aligned with your team's or department's policies?

Yes No

If you selected No on any of the above, address these issues before proceeding.

AI Application Assessment Matrix (Example)

Instructions: Use this worksheet to identify potential applications of generative AI within your workflows and establish guidelines for responsible implementation based on the considerations outlined in the columns.

Application <i>Specific task or process where generative AI could be applied.</i>	Risk Level <i>Potential risks based on data sensitivity, impact, and error potential.</i>	Boundaries <i>Clear limits and guidelines for AI use, including human oversight requirements.</i>	Transparency & Attribution <i>How AI use will be disclosed and if/how AI-generated content will be attributed.</i>	Monitoring <i>Processes for overseeing AI use, including quality control and performance evaluation.</i>
Drafting emails	Low	<ul style="list-style-type: none"> - Do not include confidential or personal information - Review content before sending 	<ul style="list-style-type: none"> - No need to be transparent about AI usage - No attribution required 	<ul style="list-style-type: none"> - Carefully review generated content before sending
Literature reviews	Medium	<ul style="list-style-type: none"> - Summarize key points, do not reproduce full text - Verify accuracy of AI-generated insights 	<ul style="list-style-type: none"> - Disclose use of generative AI in the process - Attribute AI-generated summaries 	<ul style="list-style-type: none"> - Review AI-assisted literature reviews for accuracy and completeness
Ideation and brainstorming	Low	<ul style="list-style-type: none"> - Use generative AI for initial idea generation only - Maintain human oversight and control 	<ul style="list-style-type: none"> - No need for transparency about AI usage - No attribution required 	<ul style="list-style-type: none"> - Ensure human review and refinement of AI-generated ideas
Report writing	High	<ul style="list-style-type: none"> - Avoid using AI to generate entire reports - Limit AI to specific sections (e.g., background, data summaries) 	<ul style="list-style-type: none"> - Clearly indicate which sections were AI-generated - Attribute AI contributions accordingly 	<ul style="list-style-type: none"> - Thoroughly review AI-assisted report sections for accuracy, completeness, and alignment with research goals
Data analysis	High	<ul style="list-style-type: none"> - Restrict AI to exploratory data analysis only - Ensure human validation of findings 	<ul style="list-style-type: none"> - Disclose use of generative AI in the analysis process - Attribute any AI-generated insights or visualizations 	<ul style="list-style-type: none"> - Implement rigorous checks and validations of AI-assisted data analysis

AI Application Assessment Matrix (For Your Personal Use)

Instructions: Use this worksheet to identify potential applications of generative AI within your workflows and establish guidelines for responsible implementation based on the considerations outlined in the columns.

Application <i>Specific task or process where generative AI could be applied.</i>	Risk Level <i>Potential risks based on data sensitivity, impact, and error potential.</i>	Boundaries <i>Clear limits and guidelines for AI use, including human oversight requirements.</i>	Transparency & Attribution <i>How AI use will be disclosed and if/how AI-generated content will be attributed.</i>	Monitoring <i>Processes for overseeing AI use, including quality control and performance evaluation.</i>

AI Output Verification Methods Worksheet

Instructions: Use this worksheet to determine the most appropriate method(s) for verifying AI-generated content in your work. Check all that apply and provide brief details where relevant.

- Expert Review:** Engage qualified individuals (peers, supervisors, subject matter experts) to assess the AI output for accuracy, relevance, and potential ethical concerns.
 - Who will review? (e.g., peer, supervisor, subject matter expert)
 - What aspects need review? (e.g., accuracy, relevance, ethical considerations)
- Cross-referencing:** Compare the AI output to established sources like academic literature or trusted databases to verify factual accuracy and consistency with existing knowledge. Document the sources used for future reference.
 - What sources will you use? (e.g., academic literature, trusted databases)
 - How will you document the cross-referencing process?
- Empirical Testing:** Develop a hypothesis and design an experiment to test the AI-generated suggestions or predictions. Analyze the results to draw conclusions.
 - What hypothesis or method will you test?
 - How will you design and conduct the test?
- Comparative Analysis:** Compare the AI output to alternative sources like human-generated results or established benchmarks. Use metrics like accuracy, efficiency, or performance to evaluate the quality of the AI output.
 - What will you compare the AI output to? (e.g., human-generated results, established benchmarks)
 - What metrics will you use for comparison?
- Logical/Mathematical Proof:** Apply logical reasoning or mathematical calculations to verify the correctness of the AI output, particularly relevant for outputs with a strong mathematical foundation. Involve qualified personnel to verify the proof.
 - What type of proof is needed?
 - Who will verify the proof?
- Replication of Results:** Re-run the AI process multiple times to assess consistency and identify potential variations due to different inputs or parameters. This helps to identify potential biases or instabilities in the AI model.
 - How many times will you replicate the AI process?
 - What variations in input or parameters will you test?
- Real-world Application and Observation:** Implement the AI-generated content or suggestions in a real-world setting and monitor the outcomes over time. This verifies the practical effectiveness and potential impact of the AI output.
 - How will you implement the AI-generated content or suggestions?
 - What outcomes will you monitor and for how long?

8. **Consistency Check:** Compare the AI output to established facts, principles, or previous research findings to ensure consistency. Resolve any inconsistencies through further investigation or adjustments to the AI output.

- What established facts or principles will you check against?
- How will you resolve any inconsistencies?

9. **Other Verification Method (please specify):**

- Method description: _____

- Rationale for using this method: _____

Overall Verification Strategy

Briefly describe your planned verification process, including methods used and in what order:

Generative AI Usage Documentation Form

1. Project/Task Name: _____
2. Date of AI Use: _____
3. AI Tool Used: _____
4. Version/Model of AI Tool (if known): _____
5. Interaction Environment:
 - Public web interface
 - Secure enterprise application
 - Other (please specify): _____
 - Institutional cloud instance
 - Local installation
6. Purpose of AI Use:
 - Information retrieval
 - Content generation
 - Other (please specify): _____
 - Data analysis
 - Language translation
7. Brief Description of Task: _____
8. Prompt(s) Used: _____
9. AI-Generated Output (summary or key points): _____
10. Human Modifications/Contributions:
 - Prompt engineering/refinement
 - Fact-checking and correction
 - Content expansion or elaboration
 - Reorganization of AI-generated content
 - Stylistic edits for tone or voice
 - Integration with human-generated content
 - Critical analysis or interpretation of AI output
 - Removal of irrelevant or incorrect information
 - Addition of domain-specific knowledge
 - Other: _____
11. Verification Method:
 - Expert review
 - Experimental validation
 - Cross-reference with other sources
 - Other (please specify): _____
12. Additional Notes: _____
13. Documented by: _____
14. Supervisor Approval (if required): _____

Attribution Requirement Checklist

Proper attribution of AI-generated content is important for maintaining transparency and ethical standards. This checklist will help you determine when and how to attribute the use of generative AI tools in your work. Use this worksheet to ensure that AI contributions are clearly acknowledged and that your work complies with relevant policies and guidelines.

If you select yes for any of these questions, attribution of AI use is likely required or strongly recommended.

- | | |
|--|------------|
| | Circle one |
| 1. Is the AI-generated content being used in a published work (e.g., research paper, report, article)? | Yes No |
| 2. Does the AI contribution constitute a significant portion of the work? | Yes No |
| 3. Has the AI-generated content been used with minimal or no modification? | Yes No |

If you selected yes for any of the above, attribution is generally necessary for academic integrity.

- | | |
|---|-----------|
| 4. Is the work being submitted to a journal or publisher that specifically requires AI attribution? | Yes No |
| 5. Does your institution's policy require attribution of AI use? | Yes No |

If you selected yes for any of the above, attribution is required to comply with specific policies.

- | | |
|---|-----------|
| 6. Is the AI-generated content being used in a way that could impact scientific conclusions or interpretations? | Yes No |
| 7. Are you using the AI-generated content in a teaching or presentation context where disclosing AI use would be relevant? | Yes No |
| 8. Could failure to disclose AI use be considered a form of plagiarism or academic dishonesty in this context? Would concealing AI use undermine the trustworthiness or credibility of your research? | Yes No |

If you selected yes to the above, attribution is advisable for transparency and ethical considerations.

Drafting an Attribution Statement

Creating clear and accurate attribution statements is a key aspect of responsible AI usage. This worksheet offers a formula and examples for drafting effective attribution statements, ensuring that the use of generative AI tools is transparently communicated. Use this worksheet to craft your attribution statements, providing specific details about the AI tool, its purpose, and the extent of its contribution to your work.

Attribution Formula

[AI Tool Name] version [Version Number] was used by [the User] to [Purpose/Task] in this [Type of Work]. The output was [Level of Modification] by the authors. [Additional Details if necessary].

Using this formula, here is an example attribution statement:

"ChatGPT version 3.5, an AI language model developed by OpenAI, was used by the author to assist in brainstorming ideas and generating initial drafts for sections of this report. The AI-generated content was subsequently reviewed, edited, and expanded upon by the authors to ensure accuracy and relevance to the research context."

Here are a few more examples to show how this might vary:

1. For minimal use: "DALL-E 2 was used to generate the initial concept sketch for Figure 3. The image was then refined and finalized by the research team."
2. For more extensive use: "GPT-4 was employed to assist in the literature review process, helping to summarize key points from multiple sources. All AI-generated summaries were critically reviewed, fact-checked, and integrated into the final manuscript by the authors."
3. For use in data analysis: "A custom large language model, based on the GPT architecture, was used to analyze patterns in the textual data. The model's outputs were interpreted and validated by the research team, with all conclusions drawn by human experts."

When crafting an attribution statement, consider including:

1. The specific AI tool used
2. The version or model of the AI
3. The purpose or task for which the AI was used
4. The extent of AI contribution
5. The level of human oversight and modification
6. Any limitations or potential biases of the AI tool, if relevant

Disclaimer

This toolkit is intended as a general resource for NIH staff and affiliates. However, it does not supersede or replace any policies or guidelines set forth by individual NIH Institutes and Centers (ICs) or the Department of Health and Human Services (HHS). Users of this toolkit should always consult and adhere to the specific AI usage policies and guidelines of their respective IC and any applicable HHS policies.

Before implementing any AI tools or processes in your work, ensure that you are familiar with and following the most up-to-date guidance from your specific IC and HHS. For the latest information on AI policies and guidelines specific to your IC, please consult your IC's official communications channels or contact your IC's designated AI policy representative.

Last Updated: January 17, 2025