Artificial Intelligence Safeguards and Considerations for Research Program and Project Management

Western Transportation Research Consortium (WTRC)

Transportation Pooled Fund Study (TPF-5(526)) Webinar

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Artificial Intelligence Safeguards: Webinar Goal

- Share with members of the Western Transportation Research Consortium (WTRC) pooled fund study (TPF-5(526)) and all other AASHTO member states the steps their state DOT staff can take to help protect the integrity and ownership of their agency's research as artificial intelligence (AI) tools are more widely used by researchers.

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AI Safeguards: Learning Objectives

To understand…

- What AI is

- How it affects transportation research and research reports

- What state transportation agencies can do to safeguard their work

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Understanding AI: The Basics

- What it is

- What the risks are

- How it can be used in transportation research

Understanding AI: Key Terms and Definitions

Definitions of **AI**:

- **Merriam-Webster:** Computer systems able to perform tasks or produce output normally requiring human intelligence.

- **US Code:** A machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments.

Understanding AI: Definitions

Machine Learning - Involves creating models by training an algorithm to make predictions or decisions based on data.

Understanding AI: Definitions

Generative AI - Deep learning models that can create complex original content such as long-form text, high-quality images, realistic video or audio and more in response to a user's prompt or request. This includes **Large Language Models (LLMs)**, such as those used by ChatGPT or Gemini.

Understanding AI: Definitions

Agentic AI - A system of multiple AI agents, the efforts of which are coordinated, or orchestrated, to accomplish a more complex task or a greater goal than any single agent in the system could accomplish.

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Understanding AI: Definitions

Smart Tools - Simple things we are getting used to, like wording suggestions in emails.

Understanding AI: Definitions

Doctrine of Fair Use and AI - The application of the fair use doctrine to AI is a significant legal issue, primarily centering on whether using copyrighted works to train AI models is considered "fair use" under copyright law.

Understanding AI: Risks

- Copyright infringement risks
  - Researcher not citing all sources
  - Liability if research you funded violates copyright
  - AI developers scraping your research for AI Training

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Understanding AI: Risks

- Bias - Humans have bias and LLMs or other machine learning algorithms that train on human information can intensify bias.

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Understanding AI: Risks

- Plagiarism - AI tools make it easy to plagiarize
  - A significant concern in colleges and universities
  - It can also apply to DOT research
  - Self-plagiarism is probably the most relevant concern for DOT research
  - Ensuring AI-generated information is properly cited

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Understanding AI: Risks

- Inaccuracies and hallucinations - Generative AI tools are known to generate misleading outputs, called "hallucinations"
  - Especially relevant to literature searches for your research reports

Understanding AI: Uses and Practical Considerations

From the US DOT website:

- "The Department's core philosophy is one of responsible acceleration to aggressively remove bureaucratic barriers to empower our Nation's transportation innovators while maintaining the streamlined, effective governance necessary to ensure AI is deployed safely, fosters public trust, and maximizes taxpayer value. This includes ensuring appropriate safeguards are in place to protect privacy, civil rights, and civil liberties, and to mitigate any unlawful discrimination"

Understanding AI: Uses and Practical Considerations

- Safeguard against AI rather than prohibit it

- Harness the benefits, while protecting your credibility

Understanding AI: Uses and Practical Considerations

Benefits of using AI

- Manage and analyze data efficiently

- Manage complex information

- Reinforce scholarly achievement

Understanding AI: How to Use AI

- Safeguards agencies can employ to address how AI is used and documented in research reports
- Options to protect copyrighted data and information in agency reports
- Strategies agencies can use to assess AI usage and which safeguards to apply

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Protecting Research:
What Agencies Can Realistically Do

Understanding AI: Protections

- Avoiding bias, plagiarism and copyright infringement:
  - Bias
    - Consider requiring an *Equity Impact Statement* or "AI bias audit" for any predictive data analysis model

Understanding AI: Protections

- Avoiding bias, plagiarism and copyright infringement:
  - Plagiarism
    - Strong project oversight and staged review of deliverables

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Understanding AI: Protections

- Avoiding bias, plagiarism and copyright infringement:
  - Copyright
    - AI should be properly attributed
    - Use caution when uploading project data to an AI system unless approved and secured

Understanding AI: Contract Safeguards

- Sample contract language can be introduced at the RFP stage and can include the following:
  - Copyright disclaimer
  - Copyright license and patent rights
  - AI Restrictions or Prohibitions
  - Data Management Plans

Understanding AI: Contract Safeguards

- Additional contractual requirements to consider (Talk to your legal department):
  - AI Model Documentation Plan
  - Bias and Equity Assignment
  - AI Disclosure Statement
  - Human-in-the-loop oversight of the AI model
  - Transparency and reproducibility of code and model artifacts

Understanding AI: Scraping

- AI scraping is a process that uses artificial intelligence (AI) and machine learning (ML) to automatically extract and process data from websites

Understanding AI: Scraping Safeguards

Report Distribution: Consider using repositories that maintain access control and anti-scraping measures, rather than hosting files openly on public webpages.

Understanding AI: Scraping Safeguards

- Consider applying explicit copyright statements on all reports, code, and datasets.

- The WTRC website includes examples of ways to assert copyright.

Understanding AI: Technical Safeguards

- Robots.txt and Metadata Controls

- Data Watermarking / Fingerprinting

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Understanding AI: Maintaining Credibility

- Spot checking agency reports:
  - File Metadata – critical to finding your research
  - US and metric units – AI will often use these inconsistently
  - Literature Searches/Reviews

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Understanding AI: Maintaining Credibility

- Give the Literature Search/Review close attention
  - Check for hallucinated references
  - Reference details
  - Look for a diversity of sources

Understanding AI: Maintaining Credibility

- Ensuring Section 508 and ADA compliance
  - Alt Text: Word and other tools often default to AI-generated alt text, which is often quite poor.
  - Color contrast: Word may make suggestions but it requires manual review.

Understanding AI: Maintaining Credibility

- Citing AI-derived sources:
  - MLA
  - Chicago Manual of Style
  - APA

Understanding AI: Maintaining Credibility

- Validating AI-derived sources in Final Reports
  - Consider requiring disclaimer language to disclose the use of AI in generating or summarizing references
  - Request verification that AI used in data analysis is getting proper validation
  - Consider requiring transparency if AI generated data is in the data set

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Understanding AI: Maintaining Credibility

Important:

- Prohibit uploading of project data to an unsecured AI system.

Understanding AI: Responding to Issues

Working Well with Others:
What to Do and Who to Contact
When AI Issues Arise

Understanding AI: Responding to Issues

- Recourse for researcher errors
  - Most important thing is vigilance in spot-checking as you are reviewing final reports.
  - Send things back to the researcher to correct.

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AI Safeguards: Responding to Issues

- If the researcher is not responsive:
    - Contact your legal department.

Next Steps

Brian Hirt has some thoughts on Next Steps.

Q-and-A Panel

Moderator: Lucy Koury, Nevada DOT

Subject matter expert panelists:

- Enid White, formerly Wyoming DOT, currently Enterprise Research Consultant
- Adrian Cottam, Auburn University
- Matt Miller, Cambridge Systematics

Learn More

Resource page on WTRC website:

westerntrc.org/research/25-5-ai-safeguards