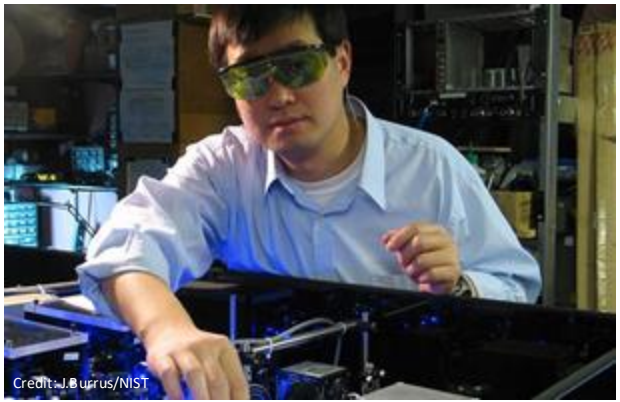
AI @NIST

NIST | NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

NIST's Mission

To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.



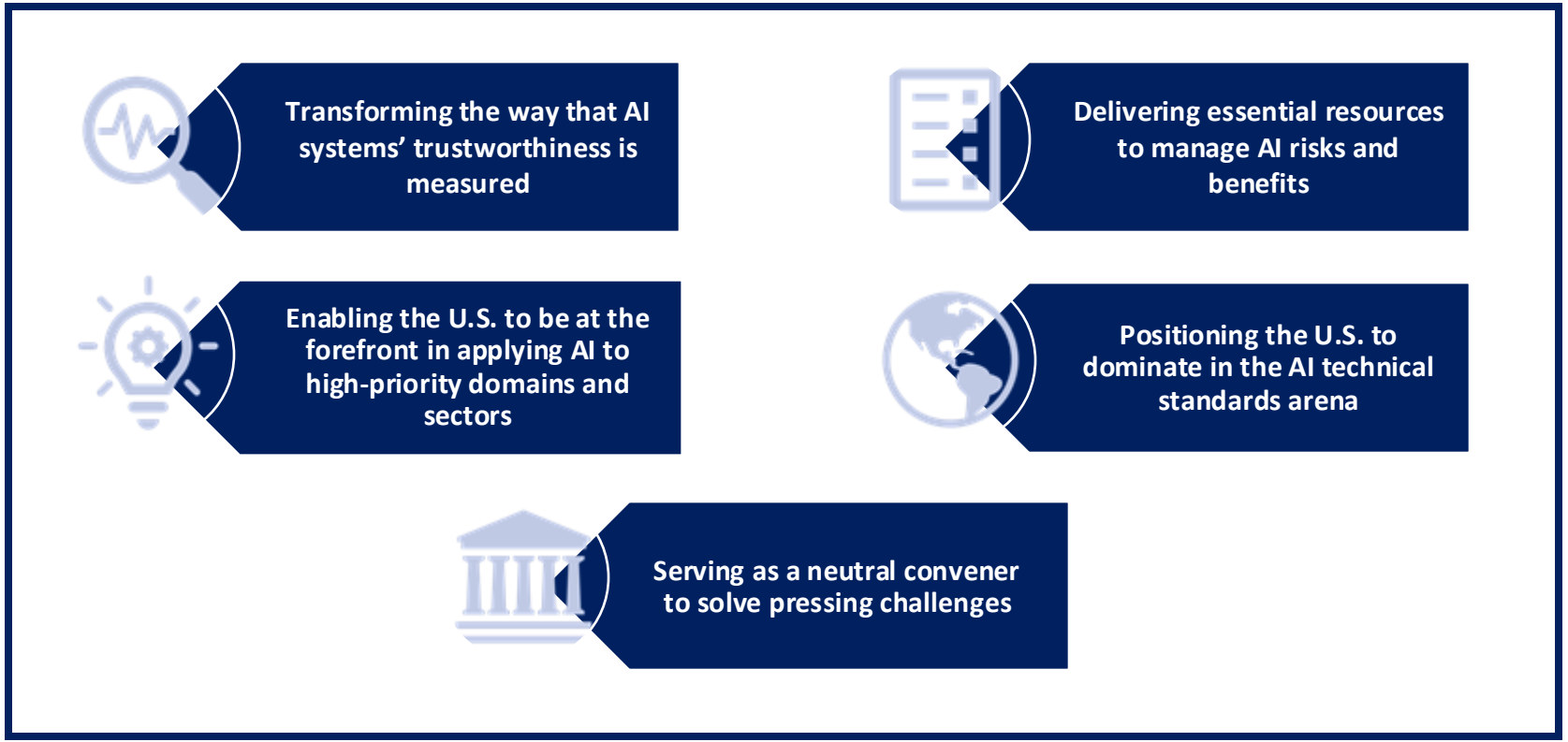
AI @NIST

NIST leads the AI community in developing best-in-class, high-quality, and unbiased outputs – measurements, testing, evaluations, and standards – which empower the U.S. to realize AI's full promise as an enabler of American innovation.

- NIST focuses on voluntary approaches and works very closely both with industry and government agencies…something it has been doing since 1901.

- NIST and the FBI have a long history of collaboration.

How NIST Contributes to Effective and Reliable AI



NIST AI Risk Management Framework and Resources

NIST AI RMF: A voluntary resource for organizations designing, developing, deploying, or using AI systems to manage AI risks and promote effective and reliable AI that promotes public trust.

Adoption of the NIST AI RMF

Background

- NIST conducted a preliminary landscape survey of **445** organizations who interacted with NIST's AI work between 2022-2025.
- **43%** of all organizations surveyed demonstrated some level of engagement with the NIST AI RMF, including:
  - **81 Industry** organizations
  - **56 Nonprofit** organizations
  - **30 Academic/Research** organizations
- Out of hundreds of engagements with the AI RMF, 60% represented significant steps toward its implementation.

"When we develop and deploy a new generative AI systems and models, **we leverage the AI Risk Management Framework created by the National Institute for Standards and Technology (NIST).**"

***Microsoft**, 2025 Responsible AI Transparency Report*

"Success in promoting interoperable global technical standards will be enhanced by continued leadership of our key science agencies, including the National Institute of Standards and Technology (NIST). **NIST's collaboration with industry on the development of the AI Risk Management Framework helped lay the foundation for the "risk-based approach" to AI policymaking.**"

***Amazon**, 2025 AI Action Plan RFI Response*

"We believe that being bold in AI means being responsible from the start. **Our approach to responsible AI is comprehensive, proactive, and aligned with industry standards, including the NIST AI Risk Management Framework**."

***Google,** 2024 Responsible AI Progress Report*

"**NIST's voluntary Risk Management Framework should be incorporated by the C-Suite of major companies and small businesses**, in particular for low-risk uses of AI. Such an approach balances the need for innovation and enables small businesses to compete and innovate through a flexible regulatory environment."

***U.S. Chamber of Commerce**, 2023 Letter to Senate Subcommittee (Consumer Protection, Product Safety & Data Security)*

Assessing Risks and Impacts of AI (ARIA)

Challenge

- AI actors require detailed information to decide whether to procure, deploy, or use AI in their specific contexts.
- There are no gold-standard methods for accounting for AI's risks and impacts in the real world.

Approach

- Establish an experimentation environment to gather evidence about what happens when people use AI under controlled real-world conditions.
- Conduct evaluations involving model, red-team, and field testing to obtain a holistic understanding of AI risk and impacts.
- Build out, design, and collect sector-specific scenarios, beginning with financial sector AI use cases.

Notable Accomplishments

- Kickoff workshop was held in November 2024 with over 300 attendees.
- Conducted ARIA Pilot Evaluation (January 2025):
  - *OpenAI, Cohere, RAND, Krish, and CSA*
  - *Over 500 interactions analyzed for 3 scenarios*

Upcoming Deliverables

- ARIA pilot evaluation report (Summer 2025)
- Multiple resource papers (September 2025)
- Initial sector-specific test kits (Fall 2025)

Goals & Impacts

- Empower organizations to evaluate their systems for real-world impacts when acquiring or deploying AI technology.
- Deliver world-leading tools, measurement methods, and metrics necessary for AI risk and impact assessments.

NIST GenAI Challenge Program

A series of GenAI pilot evaluations measure and understand system behavior for discriminating between synthetic and human-generated content in different modalities.

Specific goals of the program are to :

- Create state-of-the-art benchmark datasets.
- Measure and improve content detection technologies for different modalities (text, audio, image, video, code).
- Support the development of technologies for authenticating the source of synthetic content.

Upcoming deliverables:

- Gen AI Code Challenge: testing AI-generated software code
- GenAI Text Challenge: testing text indistinguishability and believability
- Gen AI Audio Challenge: testing deepfake voice tasks

NIST GenAI Text-to-Text

- **The pilot study aims to measure:**
  - The effectiveness of AI-generated text in mimicking human writing.
  - The ability of AI-based discriminators to distinguish between human- and AI-generated content.
- **83** participants registered.
- **Results:** While AI-generated summaries increasingly resemble human writing, detection models remain reasonably effective in distinguishing between them.
- Future work will focus on refining evaluation methodologies, expanding assessments across text, image, and audio domains, and developing standardized benchmarking protocols.

USG AI Standards Coordinator

NIST works across government and with industry to identify critical standards development activities, strategies, and gaps

NIST is coordinating in part through the Interagency Committee on Standards Policy (ICSP) AI Standards Coordination Working Group (AISCWG)

NIST seeks out AI standards development opportunities, periodically collecting information about agencies' AI standards-related priority activities and making recommendations through the interagency process to optimize engagement.

NIST FORENSIC SCIENCE TIMELINE

Dr. Wilmer Souder
Ballistics, Hand/Type Writing Cases
1920s – 1950s

NIST Law Enforcement Standards Laboratory (LESL)
1971

LESL becomes the Office of Law Enforcement Standards (OLES)
1991

NIST Forensic Science Program
2013

NIST Forensic Science Program

The Forensic Science Program strengthens the scientific basis of forensic methods, standards, and practices in the criminal justice system so that evidence is appropriately collected, accurately analyzed, and effectively communicated.

Collaboration and Support

Law enforcement Agencies

Forensic Laboratories

Courts (Attorneys, Judges, Jurors)

Research, academic, and public health organizations

Standards Development Organizations

Professional Associations (forensic and others)

Federal, State, Local Governments

Private Sector Entities

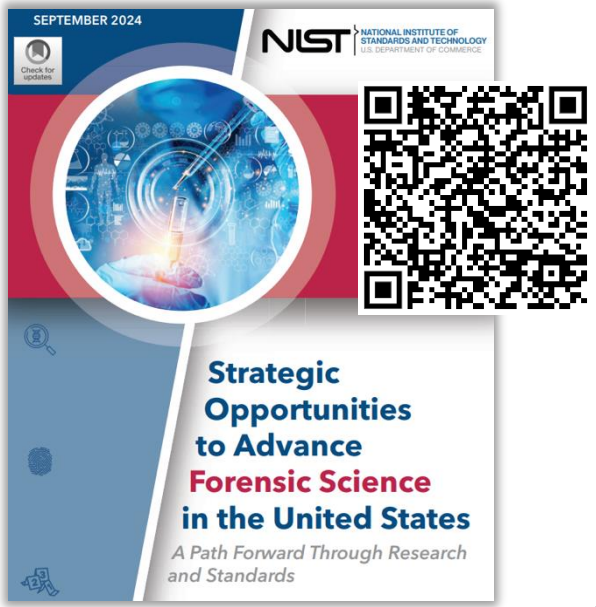
Other national and International Partners

Setting the Priorities

To strengthen the science, standards, and practices for the forensic science community

- Conducted extensive literature reviews
- Engaged with thought leaders across the forensic science community
- Sought input from NIST researchers and subject matter experts

Strategic Opportunities



AI in Forensics at NIST: *Goals*

GOAL: to **harness the transformative potential of AI for forensic science applications** through the development and application of relevant research, standards, and guidelines

promote greater awareness of the current capabilities and limitations of AI-enabled systems among forensic science service providers

spark innovation among industry to develop AI-enabled solutions to address the forensic science needs and challenges

provide guidance on how best to implement AI-enabled systems

AI in Forensics at NIST: *Actions*

Develop a Use-Case Catalog that identifies key forensic science tasks and processes where AI-enabled tools could have transformative potential

Identify current and emerging AI-enabled technologies that could address forensic science use cases

Conduct landscape analysis to identify technical barriers relating to admissibility of AI-generated results and materials

Facilitate the development of standards and guidelines for implementation of AI-enabled systems

Create an AI-in-Forensics Community of Practice that includes AI developers, forensic science practitioners, and the broader criminal justice community

Supporting the Development and Adoption of AI-Enabled Systems for Forensic Applications

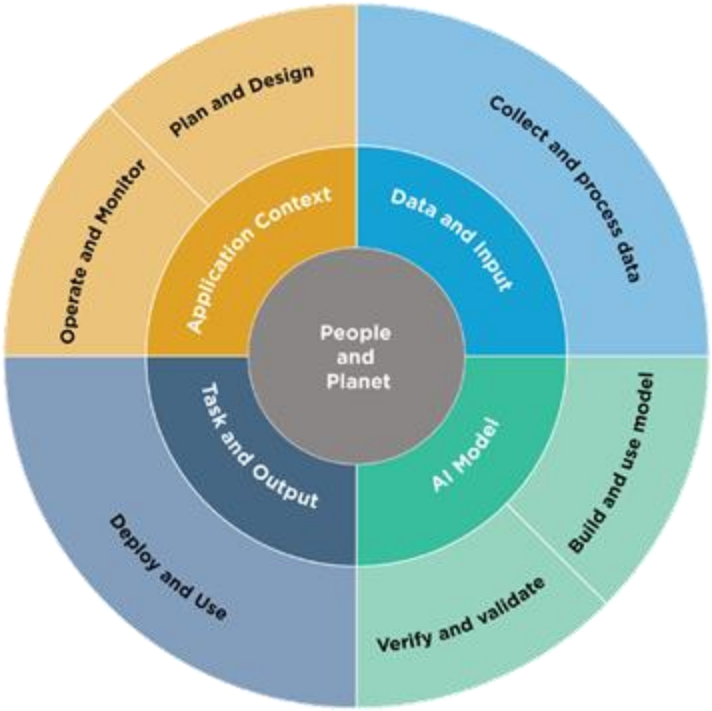


Fig. 2. Lifecycle and Key Dimensions of an AI System. Modified from OECD (2022) OECD Framework for the Classification of AI systems — OECD Digital Economy Papers. The two inner circles show AI systems' key dimensions and the outer circle shows AI lifecycle stages. Ideally, risk management efforts start with the Plan and Design function in the application context and are performed throughout the AI system lifecycle. See Figure 3 for representative AI actors.

- Help the FS community improve its understanding of AI by implementing the NIST AI RMF
- Conduct and support evaluations (e.g., model testing, red-teaming, and field testing)
- Provide access to NIST's large repository of forensic data
- Lead forensic science challenges to drive the development of innovative applications
- Coordinate, lead, and participate in standards development activities

Click, Connect, Collaborate!

https://www.nist.gov/artificial-intelligence

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