AI at ODSS

Data Infrastructure · Data Ecosystem · Tools and Analytics · Community Engagement · Workforce Development

Learn About Artificial Intelligence at NIH

Addressing the Workforce Gap in Data Governance for AI in Biomedicine

New investigators trained at the interface of information, AI, and biomedical sciences, ready to advance the field of data science for AI in biomedicine.

Ethics, Bias, and Transparency for People and Machines

Social and technical solutions for embedding ethics across the lifecycle of AI applications.

Improving the AI-readiness of Existing, IC-supported Data

Enhancing NIH data to be FAIR and AI-ready.

https://datascience.nih.gov/artificial-intelligence/initiatives

Training the Workforce to Make Data FAIR and AI/ML-Ready

Support Workforce Development at the Interface of Information Sciences, Artificial Intelligence and Machine Learning (AI/ML), and Biomedical Sciences (NOT-OD-21-079)

ODSS supported the development and implementation of curricula or training activities at the interface of information science, AI/ML, and biomedical sciences to develop the **competencies and skills needed to make biomedical data FAIR and AI/ML-ready**.

FY21: 23 Awards
- 5 IDeA States
- 4 Minority Serving Institutions
- 11 propose training on ethics of AI
- 8 with a diversity focus

Most common biomedical focus areas: cancer, environmental health, ophthalmology

NCATS | NCI | NEI | NHGRI | NHLBI | NIA | NIAID | NIBIB | NIDDK | NIGMS | NIMH | NIMHD | NINDS

Advancing the Ethical Development and Use of AI/ML

Advance the understanding, tools, metrics, and practices for the ethical development and use of AI/ML in biomedical and behavioral sciences ([NOT-OD-22-065](#))

ODSS supported the generation of **new understanding, practices, tools, techniques, metrics, or resources that will aid *others*** in making ethical decisions throughout the development and use of AI/ML, which includes the collection and generation of data as well as the reuse of data and models by others.

FY22: 23 Awards

Most common focus areas: bias, community engagement, trust, explainability, equity.

NCI | NEI | NHLBI | NIA | NIAID | NIAMS | NIDA | NIEHS | NIGMS

Collaborations to Make Data FAIR and AI/ML Ready

Support Collaborations to Improve the AI/ML Readiness of NIH-Supported Data
([NOT-OD-21-094, NOT-OD-22-067, NOT-OD-23-082](#))

NIH supported collaboration**,** bringing together expertise in biomedicine, data management, and artificial intelligence and machine learning (AI/ML) to **make NIH-supported data AI-ready for AI/ML analytics**.

FY21-FY23: 107 Awards

Most common biomedical focus areas:
Alzheimer's and Parkinson's disease, cardiovascular disease, cancer, and aging

Most common data types:
imaging, EHRs, -omics, microbes/pathogens, speech

NHGRI | NIA | NIBIB | NIDA | NIDCD | NIDCR | NIEHS | NIGMS | NIMH | NINDS | NCI | NLM | NIMHD | NIDDK | NICHD | NIAID | NIAMS | NHLBI

Call for Submission

NIH Special Track – ISMB 2024 (July 12-16, 2024; Montreal)

https://www.iscb.org/ismb2024/home

One-day special conference track on NIH funded projects focusing on:

Artificial Intelligence & Machine Learning (AI)
Cloud Research
Research Software Development

Awardees from the following funding opportunities are invited to submit an abstract for selection:

o AI/ML Readiness, Ethics, Bias, Transparency, Workforce (NOT-OD-21-094, NOT-OD-21-079, NOT-OD-22-065, NOT-OD-22-067, NOT-OD-23-082)

o AIM-AHEAD (OTA-21-017)

o Exploratory Cloud Research (NOT-OD-23-070)

o Software Tools for Open Science (NOT-OD-20-073, NOT-OD-21-091, NOT-OD-22-068, NOT-OD-23-073)

o NIH-NSF Smart Health Program (SCH) (NOT-OD-21-011, NOT-OD-23-165)

Stay tuned for information on how to submit an abstract not to exceed **300 words** on project accomplishments by end of **April 2024**

Toward an Ethical Framework for
Artificial Intelligence in Biomedical and Behavioral Research:
Transparency for Data and Model Reuse

- There are multiple examples of **unintended consequences from AI models in healthcare** and biomedicine. The root cause could be data, metadata, models, context of use, … combinations or all of these… Remediating impacts is hard.

- Increased attention to model testing and assurance. What tests and metrics are important? What potential biases or consequences are relevant?

- Federally funded, open science, is characterized by reuse of data and models.

- **NIH researchers using and developing AI want to advance ethical AI but lack guidance**.

Goals
Informed by the Workshop

Identify tools, capability gaps, new mindset of developing data and AI

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- Tools
- Training needs
- New teaming arrangements
- Open research questions
- Things outside NIH control

Begin to develop transparency guidelines for NIH awardees using, developing, or contributing to AI
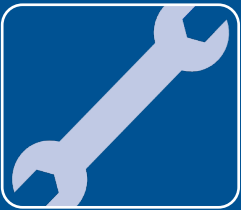
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Engagement Strategy

Look to the future: Identify trends in AI and transparency

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Inform NIH strategy

Jan 31-Feb 2, 2024

Goals and Outputs

Identify tools, capability gaps, new mindset of developing data and AI.

Begin to develop transparency guidelines for NIH awardees using, developing, or contributing to AI

Look to the future: Identify trends in AI and transparency

Report in progress & will be shared shortly!

<u>Key Findings:</u>
- ❑ **Ecosystem Needs**
- ❑ **Priority Research Directions**
- ❑ **Priority Training**
- ❑ **Priority Engagement Strategies**
- ❑ **Observations about Future Trends**
- ❑ **Initial/Draft Guidance for Awardees**

Jan 31-Feb 2, 2024

Community Feedback
2022-2023 ODSS AI Supplement PI Meetings

- **AI-Ready data and dissemination**
  - Making data FAIR and AI-ready begins at the research planning phase
  - Want places to share research results, data, training, models…
  - Datasheets are underused
  - Collaboration with AI/ML experts increases overall research budgets significantly (and may not be supported through peer review)

- **Workforce training needs**
  - Early career – skills; Post-doc / PI – study design
  - Training opportunities exist, but need to be focused on specific area of biomedicine or else won't move into practice.
  - Technology is moving faster than we can train
  - Focus on enabling team-based science rather than expecting people to gain multiple expertise. Focus on the gaps between existing expertise
  - Need for dirty data with course materials

- **Ethical thinking and integration**
  - Critical thinking, collaboration skills… these will last through technology changes.
  - Ethical thinking involves more than just a team; also requires organizational buy-in
  - Hard to find ethics experts that can speak to data issues

Your feedback at these meetings helps us to shape the future of AI at NIH!

Report from past PI meeting available **here**

Goals for the Meeting

- Foster development of cohesive AI community by uniting PI teams from FY22 & FY23 ODSS AI Supplement programs
    - Opportunity to share research results and insights from your projects with each other and NIH
    - Discuss best practices, share lessons learned, and engage in collaborative discussions

- We would immensely appreciate your active participation today & tomorrow
    - Attend the lightning talks – *ask questions & learn from peers*!
    - Think **across** AI focus areas (data, ethics, and workforce) – *to apply learnings to your work!*
    - Provide insights on current state of AI – *sharing barriers, challenges, and opportunities you've encountered or experienced in your work*!

Attendees

- **Close-out – FY22 awards:**
  - AI Ethics – NOT-OD-22-065 – 23 awards
  - AI Readiness – NOT-OD-22-067 – 36 awards
  - *Lightning talks from all awardees*

- **'Kickoff' – FY23 awards**
  - AI Readiness – NOT-OD-23-082 – 34 awards
  - *Lightning talks from interested awardees*

Agenda

Day 1 – March 27

11-11:05am	**Welcome** Laura Biven	
11:05-11:30am	**NIH Office of Data Science Strategy Overview** Susan Gregurick	
11:30am-12pm	**ODSS AI Activities Overview & Future Vision** Christine Cutillo	
12-12:25pm	**Beginning Poll**	
12:25-5pm	**Lightning Talks –** Breakout Sessions PI Teams	

Day 2 – March 28

11-11:10am	**Introduction** Christine Cutillo	
11:10am-12:10pm	**AI Feedback Session (Session 5 Breakout)** NIH Staff will lead discussions	
12:20-4:30pm	**Lightning Talks –** Breakout Sessions PI Teams	
3:50-4:30pm	**AI Feedback Session Report Back** NIH Staff	
4:30-4:50pm	**Ending Poll**	
4:50-5pm	**Closeout & Adjourn**	