

Co-producing Ethical AI in ICICLE

for the Panel: Embedding Ethics in Data-Intensive Research

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Intelligent Cyberinfrastructure with Computational Learning in the Environment (ICICLE)

*National infrastructure that
enabling AI use-inspired
research and practice at the
flick of a switch*

- US National Science
Foundation Funded AI Institute
- <http://icicle.ai>
- Award # 2112606



The twin challenges of developing *ethical* and *democratic AI*.

WE ARE TREATING THIS AS A “WICKED OPPORTUNITY” INCLUSIVE OF PROCESSES AND STAKEHOLDERS ITERATING IN RELATIONSHIPS ORIENTED TO MUTUALLY ADVANTAGEOUS GOALS.



Steps

to

operationalizING

1.

Democratizing AI benefits and development

through workforce training in ethics and allyship

“How do we do it”?



Resurfacing historical, ethical concerns
(STS and Information Theory)

- I. Workforce Development
 - A. *challenge inevitability*...
 - B. *encourage forethought*...
- II. DEI and BPC (*democratization of AI devt.* to help minimize bias)

Let's build a workforce that considers ethical implications!

Bringing contemporary, real-world issues of bias and social harm into focus
(thinking about stakeholders in the context of the risks of AI)

- III. Democratization
 - A. *Engage end-users* to maximize accessibility & minimize risk
- IV. Trustworthiness
 - A. Use *model cards* to build trust through accountability and contextuality)

Let's focus on stakeholders and use-inspired science!

Drawing on current work on AI ethics
(participating in the discourse on FAIR and ethical AI)

- V. Privacy
 - A. Employ privacy preserving techniques (requires *transparency* and *documentation*)
 - B. Apply *contextual integrity*/evaluate privacy tradeoff
- VI. Fairness
- VII. Accountability (accountable to & accountable for)
 - A. Governance and reporting
 - B. Utilize KG & visual analytics with *FAIR/FACT principles*

Let's harness the best methods in privacy, accountability, transparency, and more!

2.

Employing model cards as a mechanism to built trust through accountability and contextuality.

Method

MODEL CARDS: a mechanism for improving accountability in AI/ML development [5]

- Model cards offer a standardized method of documentation for model building which encourages transparent model reporting
- Model card reporting requires model developers to specify the context in which models are intended to be used, the performance statistics on a variety of conditions (such as cultural, demographic, and phenotypic groups), and other relevant information

Ontology Foundry

- drawing on ontology from SDO, PPOD and etc.,
- Ontology components:
 - MINT Model ontology
 - process
 - input variables
 - output variables
 - ...
 - Privacy
 - ownership
 - copyrightHolder
 - conditionsOfAccess
 - ...
 - FAIR / Transparency
 - downloadURL
 - documentationURL
 - installation instructions URL
 - ...
 - Trustworthiness
 - citation
 - license
 - ...

3.

Broadening impacts of the democratization of AI development via the development of ethics tips appropriate for high schoolers.

4.

Outreach and stakeholder involvement to
democratize AI use—operationalized through an
educational fellows program.

*The National Science Foundation-funded AI Institute for Intelligent
Cyberinfrastructure with Computational Learning in the Environment (ICICLE)
has recruited the cohort for the **2023 Educational Fellows Program**.*

5.

Democratization of AI benefits through use-
inspired science via implementation of
stakeholder privacy concerns.

Challenges

1. There must be some balance between starting from scratch with defining ethics and developing a framework, versus utilizing a broiler-plate governance framework.
2. Democratization is difficult when we don't know who will access ICICLE and how it will impact them.
3. We do not have a lot of data to help us anticipate the range of ethical issues; this is something other institutes could perhaps help us with.
4. The ICICLE workflow is conducted in thrusts, which naturally creates a siloing effect.
5. We have very few social scientists and not even a percentage of humanists. It would be good if NSF incentivized this as a criterion of diversity.

Thank you!

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<http://icicle.ai>