The NSF Program in Fair AI in Collaboration with Amazon (FAI)

NSF 21-585

Program Information Webinar

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National Science Foundation

FAI Program Web Page
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505651

amazon

FAI Team

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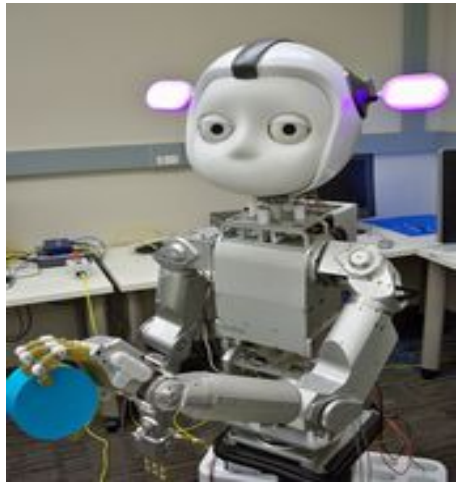
Selena Zou

Why FAI ?

AI algorithms touch millions everyday, some in high-stakes arenas (e.g. criminal justice, medicine, credit evaluation), sometimes with adverse affects.



The National Academies of Science, Engineering, and Medicine;
The National Science & Technology Council
identified critical needs in AI research related to ethics and societal impact including:

Building ethical AI systems, fairness of algorithmic decision support, trust, transparency and interpretability, accountability, and access.

Why a Public--Private Partnership ?

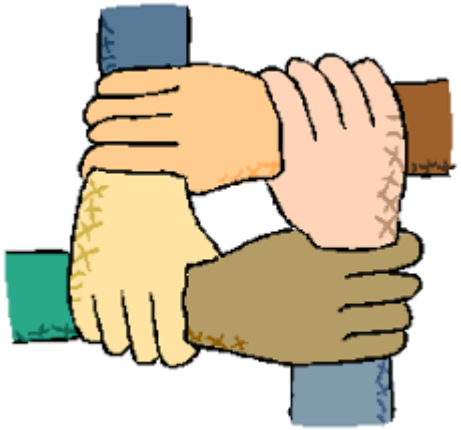
NSF partners with the private sector across multiple programs (e.g. Smart and Connected Communities, AI Institutes, Platforms for Advanced Wireless Research, see https://www.nsf.gov/about/partners/)

- Advance understanding of challenges across the technology ecosystem
- Inform the design and deployment of future systems
- Provides exposure to industry for students

- Provide pathways to transition research results to practice
- Allows industry partners to learn from research results

FAI Goals

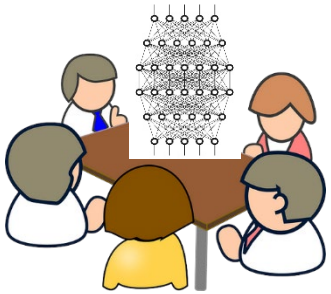
Support research that contributes to trustworthy AI systems, including --- but not limited to:



- Designing fairness into AI systems
- Ensuring that systems are impartial and broadly inclusive
- Transparency, explainability, accountability
- Factors that affect algorithmic trustworthiness
- Ethical decision-support
- Detecting and ameliorating adverse biases

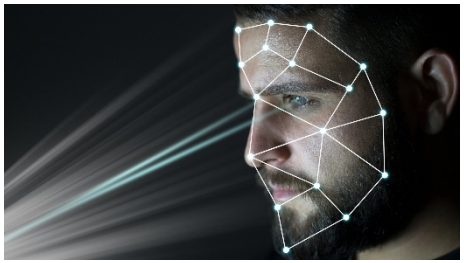
FAI Research Thrusts

Technical contributions might include --- but are not limited to:



- Human-machine collaboration --- joint decision-making, incorporating varied stakeholder values

- Algorithms that can quickly and appropriately adjust to differences between population subgroups
- Unbiased outcomes in speech, language, and vision applications



- Design methods with *a priori* socio-cultural awareness
- Theoretical guarantees and limits on fairness
- Detecting and ameliorating bias
- AI to enhance societal good

FAI Research Thrusts

We Encourage Work in All Application Areas

Speech and language, computer vision, education, decision support, city maintenance, criminal justice, food distribution …

Projects must clearly be driven by fairness considerations and show computational innovation

Who Can Be a PI ?

The lead PI on each proposal must bring computer science expertise to the research

- Evidenced by publications, research focus, training …
- Department affiliations can vary --- computer science, electrical engineering, math, statistics, operations research …

To be effective for fairness, computationally-focused research efforts need to be informed by socio-technical and social behavioral needs of the field.

Consider multiple contexts and integrate disciplinary perspectives from social, behavioral, economic, cognitive … as needed

Include perspectives from policy makers, resource managers, business leaders, the justice system where appropriate.

Investigator and Institutional Diversity

NSF's mission includes broadening participation of groups, institutions, and geographic regions underrepresented in STEM.

NSF and Amazon strongly encourage applications from minority investigators and those from Minority Serving Institutions.

Ensuring fairness in AI systems requires diverse societal players participate in design, development, evaluation, deployment, and monitoring.

Alignment with CISE MSI Research Expansion Program for Institutional Diversity

Institutional Diversity

- Minority Serving Institutions, including Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions (HSIs), and Tribal Colleges & Universities (TCUs) are encouraged to apply.

- Institutions must satisfy the definition of an MSI (HBCU, HSI or TCU) defined in the MSI Research Expansion Program solicitation NSF 21-533 .

- Like the CISE MSI Research Expansion Program, FAI encourages applications from MSIs who have not traditionally received awards in the CISE Core and MSI participating programs.

CISE Resources for MSI Investigators

FAI Review and Award Process

Amazon is not involved in any aspect of proposal review or award selection.

FAI uses standard NSF panel and ad hoc peer review. Amazon is not present during review or award selection.

NSF portion of award is through standard grant.

Amazon portion of award is through lump-sum, unrestricted gift direct to award institution.

Proposal should give entire budget as for a regular NSF application. The split between NSF and Amazon is handled after award selection. (See solicitation NSF 21-585 .)

Review Criteria

Standard NSF review criteria --- Intellectual Merit and Broader Impact

- **Intellectual Merit –** Describe potential to advance knowledge. Motivation behind work, specific problems to be solved, challenges, approaches, and evaluation of outcomes.

- **Broader Impacts -** Describe potential to benefit society and contribute to the achievement of specific societal outcomes. May include impact on other research, educational experiences; dissemination of tools, methods, results, and data; broadening participation of underrepresented groups, and benefits to society.

(See NSF PAPPG NSF 20-1)

Review Criteria

Solicitation-Specific Criteria (required separate sections clearly labeled with these headings)

1. **Transformative Research** --- Fundamental computer science research with transformative potential for fairness, incorporate multiple disciplinary perspectives as needed.

2. **Embedding Innovations in Real Systems** --- Development and testing, pilots, implementations, or deployments in real systems, associated challenges to fairness.

3. **Evaluation** --- How progress and outcomes are evaluated; measures or metrics; describe methods, measures, processes, and criteria to assess progress and outcomes.

Multi-Institution Projects

Multi-institution project proposals are welcome

Proposal submitted by one organization, funding for all other participating organizations through subawards
See PAPPG Chapter II.D.3.a

NSF portion of award is granted to lead institution, with collaborating institutions receiving subcontract through the lead.

Amazon provides unrestricted gifts separately to lead and collaborating institutions.

We encourage proposals from minority PIs and MSI acting as lead.

What's Been Funded ?

See link "What Has Been Funded" at bottom of FAI web page

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505651

FAQs

Q: Does the lead PI have to be in a computer science department?
A: No, the lead PI must bring computer science expertise to the project, as demonstrated by research and publication history and focus, and training where relevant. Department affiliation is secondary.

Q: Can Amazon scholars participate in proposals and projects?
A: Individuals affiliated with Amazon (currently employed by, consulting for, or on an active agreement to provide services for Amazon) may participate in proposals but

- They may not participate in their capacity with Amazon
- Such individuals may participate if they (i) hold a primary appointment at another organization (e.g. primary academic appointment at an institution of higher education), as applicable to and defined by that organization, and (ii) do so strictly in their capacity at that other organization.

FAQs

Q: Are awardees obligated or expect to partner with Amazon?

A: No. At the request of an awardee, or of NSF with the awardee's consent, Amazon researchers may consult on the projects, may be able to host student interns as desired by the PI and student Amazon personnel will be available to the academic researchers solely for the benefit of the academic researchers and will not attempt to control or direct the research.

Expertise provided by Amazon (at the request of the PI) is advice and not compulsory for the awardee.

Amazon does not seek any information that the awardee does not intend to share publicly (awardee should not voluntarily share such information).

Amazon may refer awardees to publicly available software, computing infrastructure, or other support – but in no case will any awardee be required to accept or use these contributions

FAQs

Q: I was on a proposal that funded last year. Can I be involved in a new proposal this year?

A: Yes

Q: What if I want to review for the program?

A: As long as you are not participating in a proposal, you can review for the program.

Send your CV and a short statement of reviewing interest and expertise to tleen@nsf.gov, sspengle@nsf.gov, or sbreckle@nsf.gov

Further Questions ?

Ask during this Q&A, or privately to

Todd Leen – tleen@nsf.gov
Sylvia Spengler – sspengle@nsf.gov
Steve Breckler – sbreckle@nsf.gov

Proposals due by 5pm submitter's local time, August 3, 2021

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CISE-MSI Research Expansion Program page
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505854&WT.mc_id=USNSF_41&WT.mc_ev=click