CISE, SBE and the Evolving and Expanding Role of Ethics at NSF and Beyond

Policy Statements, Guidelines, and Programs

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America COMPETES Act RECR Training Requirements

The responsible and ethical conduct of research (RECR) is critical for excellence, as well as public trust, in science and engineering. Consequently, education in RECR is considered essential in the preparation of future scientists and engineers.

Statutory Requirement: "The Director shall require that each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers participating in the proposed research project."

Responsible and Ethical Conduct of Research

The responsible and ethical conduct of research involves not only a responsibility to generate and disseminate knowledge with rigor and integrity, but also a responsibility to:

- Conduct peer review with the highest ethical standards;
- Diligently protect proprietary information and intellectual property from inappropriate disclosure; and
- Treat students and colleagues fairly and with respect.

Ethical and Responsible Research (ER2)

ER2 funds research projects that identify:

- Factors that are effective in the formation of ethical STEM researchers
- Approaches to developing those factors in STEM fields NSF supports

ER2 solicits proposals for research that explores the following:

- What constitutes responsible conduct for research (RCR)?
- Which cultural and institutional contexts promote ethical STEM research and practice and why?'
- Do certain labs have a 'culture of academic integrity'?
- What practices contribute to the establishment and maintenance of ethical cultures?
- How can these practices be transferred, extended to, and integrated into other research and learning settings?'

Science and Technology Studies (STS)

The Science and Technology Studies (STS) program supports research that uses historical, philosophical, and social scientific methods to investigate the intellectual, material, and social facets of the scientific, technological, engineering and mathematical (STEM) disciplines.

It encompasses a broad spectrum of topics including interdisciplinary studies of ethics, equity, governance, and policy issues that are closely related to STEM disciplines.

Dear Colleague Letter: Fairness, Ethics, Accountability, and Transparency (FEAT)

Enabling Breakthrough Research to Expand Inclusivity in CISE Research

- CISE is committed to maximizing the positive consequences of the research that it funds through ***inclusive*** research approaches
- A key component of its mission: to contribute to ***universal, transparent, and affordable participation*** in an information-based society
- Some research practices and methods may carry ***biases*** and ***inequities*** that can in turn have significant impacts on the scientific community and broader society.
- The increased reliance on computing and information technologies may further increase and automate such biases and inequities.

Dear Colleague Letter: Fairness, Ethics, Accountability, and Transparency (FEAT)

With this DCL, CISE invites principal investigators to ***submit proposals to CISE core programs*** (spanning the CNS, CCF, and IIS divisions and the OAC) that contribute to discovery in research and practice related to FEAT in computer and information science and engineering.

Specifically, CISE is interested in receiving, through these programs:

- Proposals pertaining to general topics in computer and information science and engineering while also integrating or applying approaches to advance FEAT
- Proposals whose primary foci are on methods, techniques, tools, and evaluation practices as means to explore implications for FEAT

In explorations and use of FEAT, PIs are strongly encouraged to select and articulate their own disciplinary or interdisciplinary definitions consistent or aligned with these concepts.

FEAT (continued)

The central goal of FEAT is to enable breakthrough research to expand inclusivity in CISE research

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- The increased reliance on computing and information technologies may further increase and automate such biases and inequities.
- CISE is committed to maximizing the positive consequences of the research that it funds through ***inclusive*** research approaches
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Secure and Trustworthy Cyberspace (SaTC)

The scope of the SaTC core research program is broad and interdisciplinary, and welcomes foundational research on security and privacy from researchers in computer science, engineering, mathematics, and social, behavioral, and economic sciences. SaTC views cybersecurity as a socio-technical challenge and encourages proposals that advance the field of cybersecurity within a single discipline or multiple disciplines.

This solicitation focuses only on research directly supporting a safe, secure, resilient, and trustworthy cyberspace, conducted ethically with the highest scientific standards. Of special interest are proposals that are transformative, forward-looking, and offer innovative or clean-slate approaches that provide defenders a distinct advantage.

NSF Program on Fairness in Artificial Intelligence in Collaboration with Amazon (FAI)

Broad acceptance of large-scale deployments of AI systems relies critically on their trustworthiness which, in turn, depends upon the collective ability to ensure, assess, and ultimately demonstrate the fairness, transparency, explainability, and accountability of such systems. Importantly, the beneficial effects of AI systems should be broadly available across all segments of society.

NSF and Amazon are partnering to jointly support computational research focused on fairness in AI, with the goal of contributing to trustworthy AI systems that are readily accepted and deployed to tackle grand challenges facing society.

Specific topics of interest include but are not limited to **transparency**, explainability, **accountability**, potential adverse biases and effects, mitigation strategies, validation of **fairness**, and considerations of inclusivity.

DCL: EArly-concept Grants for Exploratory Research on Artificial Intelligence and Society

Supported jointly with the Partnership on AI to fund high-risk, high-reward research at the intersection of the social and technical dimensions of AI, with priority given to collaborative projects that integrate computer/computational science with the social, behavioral, and economic sciences, and eerve to expand understanding of the influences of AI on society or contribute technical innovations that overcome emerging social challenges.

Topics may include, but are not limited to:

- Safety, robustness, and **accountability** of AI systems;
- Bias and **fairness** of AI systems;
- Intelligibility, explanation, and **transparency** of AI inferences;
- Privacy challenges with AI development and use;
- Sociotechnical challenges involving **ethical** considerations;
- Economic impacts of AI on society; and
- Social consequences of AI system deployments.

OECD Principles for Responsible Stewardship of Trustworthy AI

The Organisation for Economic Co-operation and Development (OECD) identifies five values-based principles for the responsible stewardship of trustworthy AI and calls on AI actors to promote and implement them:

- Inclusive growth, sustainable development and well-being
- **Human-centred values** and **fairness**
- **Transparency** and explainability
- Robustness, security and safety
- **Accountability**

Michael Kratsios on the OECD Principles

"It is no surprise that the wide range of countries within the OECD would have differences in their approach to technology policy. That is why the OECD AI Recommendations are truly a testament to our countries' commitment to innovative and trustworthy AI on behalf of our citizens. Together we will advance AI with strength, speed, and purpose."

Michael Kratsios, Deputy Assistant to the President for Technology Policy at The White House (22 May 2019, OECD Forum Network Meeting)

Rome Call for AI Ethics

The sponsors of the call express their desire to work together, in this context and at a national and international level, to promote “algor-ethics”, namely the ethical use of AI as defined by the following principles:

- ***Transparency****: in principle, AI systems must be explainable*
- ***Inclusion****: the needs of all human beings must be taken into consideration so that everyone can benefit and all individuals can be offered the best possible conditions to express themselves and develop*
- ***Responsibility****: those who design and deploy the use of AI must proceed with responsibility and transparency*
- ***Impartiality:*** *do not create or act according to bias, thus safeguarding fairness and human dignity*
- ***Reliability****: AI systems must be able to work reliably*
- ***Security and privacy:*** *AI systems must work securely and respect the privacy of users*

These principles are fundamental elements of good innovation.

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Thank you!