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## Institute for Data, Intelligent Systems, and Computation (I-DISC)

Lehigh University  
Building C, Rm 229  
113 Research Drive  
Bethlehem, PA 18015

# Promoting Equity and Justice in Data and Computing: I-DISC, Data and Computing Justice, and DEI

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## Vision

The past few decades of advances in data- and computing-related fields have led to massive changes in the ways that we work, live, date, learn, watch, and invest. Data, models, and algorithms influence, or even dictate, who gets offered a job or a college acceptance, who gets approved for a loan or an insurance policy, who gets policed or paroled. Many computerized systems for making decisions in these arenas have been shown to produce racist and sexist outcomes, to exacerbate inequities, and to prey on the vulnerable. What's more, these tools have evolved at a rapid clip, outpacing society's ability to monitor, regulate, and even understand their impacts and consequences.<sup>1</sup>

At the same time, data and computation can be used to reduce, rather than exacerbate, oppression in society. Researchers have used data and computational science to [detect evidence of labor exploitation in manufacturing supply chains](#), to [rectify racist inequalities in COVID-19 treatment](#), and to [improve diversity and inclusion in film and TV representations](#), to name a few examples.

Furthermore, data- and computation-related fields have notoriously poor racial and gender diversity, within the academy (among both students and faculty) as well as in the private sector. The tech industry imposes a variety of obstacles on female and BIPOC employees, from biased hiring procedures to power imbalances to hostile work environments.<sup>2</sup> Higher education has seen a steady, though modest, increase in the percentage of engineering Bachelor's and

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<sup>1</sup> See, e.g., Ruha Benjamin, *Race After Technology: Abolitionist Tools for the New Jim Code*. Hoboken, NJ: Wiley, 2019; and Cathy O'Neil. *Weapons of Math Destruction*. New York: Penguin Random House, 2016.

<sup>2</sup> See, e.g., Janet Abbate, "Coding is Not Empowerment" and Mar Hicks, "Sexism is a Feature, Not a Bug" in Thomas S. Mullaney, et al. (eds.), *Your Computer is on Fire*. Cambridge: The MIT Press, 2021.

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Doctorate degrees earned by BIPOC students in the past decade,<sup>3</sup> but there have been no such improvements among the professoriate, as the percentage of Black and Hispanic professors among engineering faculty has remained stagnant.<sup>4</sup>

These two types of structural inequity in data and computation—unjust outcomes and lack of diversity—are, of course, linked. Racist algorithm outputs may be due, at least in part, to a lack of diversity among software development teams.<sup>5</sup> And diversity is difficult to attain when female and BIPOC tech employees [face retaliation](#) for speaking out against the harmful outcomes of software and systems.

In the academic context, we argue that diversity among faculty, students, and staff promotes excellence in research; diverse viewpoints shed light on potential harms of research projects as well as on potential opportunities for new research questions and directions.

I-DISC commits to **promoting equity and justice in data and computing** through both:

1. **Data and Computing Justice Research:** Scholarship related to identifying and mitigating the racist, sexist, ableist, homophobic, and other oppressive outcomes that are often produced by data and computation tools, as well as scholarship related to the positive outcomes that can emerge from careful design and implementation of such tools.
2. **Diversity, Equity, and Inclusion (DEI):** Policies, practices, and procedures for improving DEI, within I-DISC, within Lehigh as a whole, and within the broader data and computation community.

These commitments are informed by the following principles:

- As members of the I-DISC community, we all bear the responsibility to correct historical inequities and to produce scholarship that ameliorates those inequities. The membership of I-DISC is drawn from all five of the colleges at Lehigh, and as such, we see the opportunity for impact across the university.
- It is incumbent on members of the I-DISC community to educate themselves and others about both the dangers and the opportunities presented by modern data and computation when it comes to structural inequities, and to make strides toward ensuring that scholars at Lehigh and elsewhere are mindful of the potential harms and benefits of their research, whether or not their research explicitly focuses on such inequities.

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<sup>3</sup> National Science Foundation, National Center for Science and Engineering Statistics. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2019*. Special Report NSF 19-304. Alexandria, VA. 2019. Available at <https://www.nsf.gov/statistics/wmpd>.

<sup>4</sup> Joseph Roy. *2018 Engineering by the Numbers*. American Society for Engineering Education. 2018. <https://ira.asee.org/wp-content/uploads/2019/07/2018-Engineering-by-Numbers-Engineering-Statistics-UPDATED-15-July-2019.pdf>.

<sup>5</sup> See, e.g., Safiya Umoja Noble, *Algorithms of Oppression*. New York: New York University Press, 2018.

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- We understand and acknowledge that racism, sexism, homophobia, and other forms of oppression overlap and intersect in distinctive ways, many of which are invisible to those who have not experienced them.
  - I-DISC has a unique role to play in building an understanding of the social benefits and harms that come from the scientific tools and practices that are common in our fields. The design and implementation of algorithms, datasets, and computing systems often amplify biases and inequities, even unintended ones, while at the same time hiding behind a guise of objectivity. Designers and implementers must be diligent and aware of these issues at all levels of the software lifecycle.
  - At the same time, computing offers opportunities to detect and mitigate bias and inequity, if designed and implemented carefully.
  - As an interdisciplinary research institute (IRI), the primary mission of I-DISC is to support research activities. I-DISC does not hire faculty, recruit students, or offer classes. As such, our goals and actions with respect to DEI are different from, and complementary to, those of a department, college, or university.

## **Data and Computing Justice Research**

I-DISC commits to supporting scholarship that identifies and counters racist, sexist, ableist, homophobic, and other oppressive outcomes from data and computation tools, as well as scholarship that promotes the positive outcomes that can emerge from careful design and implementation of such tools.

Such scholarship includes studies of AI ethics, data bias, machine learning fairness, inequities in the digital economy, energy/environmental impact of computing, privacy and blockchain, etc.

I-DISC will endeavor to support such scholarship through the following actions:

- Inform and educate the I-DISC community about structural racism, sexism, homophobia, and other forms of oppression, with a particular focus on how data and computation amplify bias and inequity, through a series of seminars with experts in the field.
- Provide expertise to researchers regarding how to assess bias and inequity in datasets, models, and algorithms.
- Develop a repository to collect and make available training material that I-DISC members can use for educational purposes and for improving grant activities.
- Train I-DISC Fellows in issues related to data and computing justice, and encourage Fellows to bring data and computing justice issues to light when consulting with faculty members. If possible, create a Fellow position specifically for this purpose.
- Create a working group of faculty members affiliated with I-DISC willing to help answer questions about data and computing justice practices.

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- Promote events, resources, and scholarship from data and computing justice organizations such as the [Algorithmic Justice League](#) and [Feminist.AI](#).
  - Launch an I-DISC award for excellence in equity and justice in data and computing (which could be data and computing justice research, DEI-based activities, etc.).
  - Include topics related to data and computing justice in the agendas for Faculty Forums, Graduate Student Forums, and advisory committee meetings.
  - Promote the visibility of technical research (by internal or external investigators) related to data and computing justice, e.g., in newsletters and Faculty/Graduate Student Forums.

## Diversity, Equity, and Inclusion

I-DISC endeavors to support DEI practices, whether performed broadly (e.g., at the college or university level) or more narrowly (by individuals, departments, or centers). Examples of efforts that I-DISC and its members will take to support DEI include:

- Supporting Greer Scholars as members of our research labs.
- Forming partnerships with external organizations that promote diversity in data and computation (such as [WiCS](#) or [Black Girls Code](#)).
- Striving for diversity among I-DISC seminar speakers.
- Supporting responsive, egalitarian, collaborative relationships with historically Black colleges or universities (HBCUs) and Hispanic-serving institutions (HSIs).
- Employing a DEI consultant for grant assistance.
- Offering resources to faculty to recruit and support students from under-represented groups.
- Supporting other efforts on campus to mentor/support STEM students from underrepresented groups.
- Prioritizing funding of DEI activities within the I-DISC discretionary budget, for example, by supporting students from under-represented groups (e.g., Greer Scholars) via undergraduate research funds and by endeavoring to recruit I-DISC Fellows from under-represented groups.

## Transparency and Accountability

The goals outlined in this document are made more concrete in the Appendix to this document, which lays out specific goals and metrics for I-DISC equity and justice efforts in both the short term (1 year) and long term (5 years). The Appendix will be updated each year to assess I-DISC's efforts over the previous year and to update the goals for the coming years.

This document, and the current and past Appendices, will be posted publicly on the I-DISC website at [idisc.lehigh.edu/dcej](http://idisc.lehigh.edu/dcej). I-DISC will report publicly and transparently on its progress,

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accomplishments, and shortcomings toward promoting equity and justice in data and computing in the following venues:

- A dedicated section on “Promoting Equity and Justice” in the I-DISC Annual Report
- An update provided to the full I-DISC faculty once per year at a Faculty Forum
- An update posted on the I-DISC website once per year
- Regular (at least once per semester) updates provided to the Faculty Advisory Council and External Advisory Council

These updates and reports will include both quantitative and qualitative descriptions of the progress we have made in data and computing justice scholarship, DEI efforts, and promoting equity and justice more broadly.

## **I-DISC DEI Working Group**

The I-DISC DEI Working Group was formed in the Spring 2021 semester, with the following members:

- Josh Agar (MSE, RCEAS)
- Kate Arrington (Psychology, CAS)
- Brian Davison (CSE, RCEAS)
- Chinedu Ekuma (Physics, CAS)
- Roberto Palmieri (CSE, RCEAS)
- Larry Snyder (ISE, RCEAS)
- Sarah Wing (I-DISC)
- Yue Yu (Mathematics, CAS)

All members of the Working Group are also I-DISC members.

The group met roughly once per month during Summer 2021. At these meetings, working group members brainstormed and discussed all aspects of this plan. Following each meeting, group members were tasked with action items to be completed before the next meeting. The plan itself was drafted by all members of the Working Group.

We are grateful to Prof. Suzanne Edwards (English, WGSS) and Prof. Nancy Carlisle (Psychology) for additional feedback on this document.

The Working Group plans to continue to meet after the release of this document, to implement the elements of the plan, revise the plan as needed, and continue to shape I-DISC efforts toward addressing structural inequities in data and computation.