



Teams

Play 1. Enable diverse and multi-disciplinary teams working on algorithms and AI systems.

Having diverse teams researching, developing, operationalizing and managing algorithms and AI systems is critical. “Diverse” teams include, but aren’t limited to, women and people of color. Diversity includes individuals with differing personal and group characteristics - such as age, ability, sexual orientation, etc. To assemble and support diverse teams, leaders must incorporate diversity, equity and inclusion (DEI) principles, policies and practices into the organization. Even with diverse teams, we all have blind spots. The responsibility cannot only be placed on diverse individuals to identify and mitigate biases. Engaging individuals in the social sciences and humanities – as well as domain experts – is important.



PLAYERS INVOLVED:

- C-suite
- Human Resources
- D&I Leads



BUSINESS BENEFITS:

- Mitigate risk by incorporating diverse perspectives in AI systems that can help avoid costly biases
- Benefit from the “**diversity dividend**” (whereby teams with greater diversity tend to be more creative, innovative and, ultimately, associated with greater profitability)
- Attract and keep talent in a tight AI talent market¹
- Avoid unfairness-based turnover of women and people of color (a \$16B a year problem in tech²)

Elements:

Tools:

- Ensure diversity is a core leadership priority.
 - Establish corporate level commitment and goals to advance DEI at all levels (including the board) and across departments
 - Communicate this priority and its cultural / business value to staff
 - Hire Chief DEI Officer who reports to the CEO
 - Incorporate targets and a measurement system to track progress to goals, along with accountability structures
 - Reward those doing well advancing DEI
 - Tie executive incentive structures to increases in hiring, retention and promotion of underrepresented groups

Diversity Dashboard– a beta tool for tech companies to measure and highlight potential differences between the treatment of men and women in the workplace (Alan Turing Society)

- Update institutional policies, structures and practices to explicitly support diversity and inclusion.
 - Includes measures related to recruitment, promotion and employee evaluations, pay, sexual harassment, flexible work and care.
 - Create a supportive community and culture with shared responsibility and accountability to advance DEI at all levels

- [Diversity, Equity & Inclusion \(DEI\) Checklist](#) (EGAL)
- [Supporting Dual Career Couples Playbook](#) (EGAL): various resources and relevant plays

- Ensure technical teams are multi-disciplinary.
 - Develop approaches to recruiting, retaining and promoting domain experts and individuals with backgrounds in disciplines such as sociology, philosophy, and economics

Elements:

- Measure and share data on diversity metrics; review communications.
 - Collect and disaggregate diversity data on recruitment, hiring, pay level, promotion and retention
 - Disaggregate data across functional levels and teams and conduct regular internal review sessions
 - Report this data to employees and the public
 - Assess and revise internal and external communications to contain gender neutral / equitable language and representative photos

- Invest in expanding the pipeline for diverse individuals in engineering and data science.

- Invest in research to understand more around advancing DEI in the technology and AI sector.
 - It is not enough to focus research only on white women. Research is needed that explores gender, race, ethnicity, sexual orientation, ability, socio-economic status – and incorporates intersectionality.

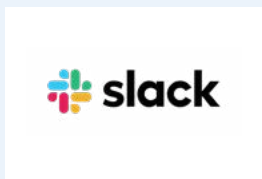
Tools:

[Do Ask, Do Tell: Capturing Data on Sexual Orientation and Gender Identity Globally](#) (Stonewall)

See Play 6 for more information

- [AI and Gender: Four Proposals for Future Research](#)
- [Toward Fairness in AI for People with Disabilities: A Research Roadmap](#)

Example & leader: Slack is ahead in Silicon Valley when it comes to a diverse workforce. While not explicitly an AI company, Slack is a global tech company others can learn from in regards to DEI. Women make up 29.9% of leadership, and hold 33.4% of technical roles.³ In the US offices, people of color make up almost 14.2% of technical roles and 8.8% of the US leadership team.⁴ The CEO, Stewart Butterfield, made D&I an explicit priority from the beginning⁵, understood the business need for inclusive culture and diverse talent,⁶ and connected this priority to the company's core values.⁷ It's made clear to all employees that D&I is an important and shared responsibility.⁸



The company proactively seeks candidates from outside traditional pipelines and through diverse channels (e.g., Year Up and Code2040 that focus on socioeconomic diversity and racial diversity respectively) and is careful about job descriptions (running all job descriptions through a platform called Textio to promote inclusive language). Instead of "whiteboard interviews" that can create extra stressors for people from underrepresented groups, Slack does blind code reviews – candidates complete a problem at home which is evaluated against a checklist.⁹ Interviewers practice to improve skills and questions are standardized based on sought after characteristics and skills.¹⁰

Slack reviews promotion data regularly to ensure no gender disparities in promotion. Employee salaries are routinely monitored by an independent third party. "Embedding diversity, engagement and belonging in our hiring practices and workplace culture is all about living our values," says Jeunée Simon. "The sudden transition to remote work has provided new challenges but also opens up new opportunities to recruit from an even broader base of diverse top talent."¹¹

Slack still has space to grow. For example, representation of women and URM's drops at more senior levels. Read more about Slack's efforts here: [How Slack got ahead in diversity](#) (The Atlantic).

Background:

AI technologies are informed by the people who build and develop them.¹² The tech industry is infamous for its lack of diversity. The workplace and the products developed are missing out on diverse perspectives, lived experiences and views. Many individuals in tech have not experienced sexism, racism, classism, etc., and can have trouble seeing it – in their own lives and in the products they develop. While diversity is critical to mitigate bias in AI, it's also not sufficient – multi-disciplinary teams are needed.

What are the numbers?

There is a lack of diversity in those researching, designing, coding, engineering and programming AI technology – as outlined in the Mitigating Bias in AI playbook. AI is a subfield of computer science, which is experiencing a historic low point for gender diversity: in 2013, the share of women in computing below the level it was at in 1960.¹³ In AI, only 18% of authors at the leading 21 conferences are women and 80% of AI professors are men. The trends hold when taking race into account. There is no reported data on transgender or other gender minorities.¹⁴ Outside of computer science and AI, racial and gender diversity in STEM has improved.¹⁵

What are the reasons for lack of diversity?

Stereotypes and structural barriers result in fewer women and people of color in STEM fields. In tech workplaces, various challenges continue.

Stereotypes are prevalent and reinforced in education, culture and media. There is a “brilliance bias” (where women are not seen as naturally brilliant) taught to children at a young age.¹⁶ Research by McKinsey in the US finds that only 44% of girls say they are willing to try computer science even though over 90% are aware of it.¹⁷ These gender stereotypes aren't universally held: women constitute half of all computer science students in higher education in Malaysia.¹⁸ Media reinforces stereotypes. In movies and TV, computer science characters are almost all white males with other stereotypes also perpetuated, such as few characters as parents.¹⁹

Lack of role models in computer science textbooks reinforces stereotypes and can also impact performance in school. But these role models exist: Historically, women have played important roles to contribute to the development of AI. Ada Lovelace arguably wrote the first ever code and women were instrumental in coding and programming, especially from WWII to the 1960s.²⁰

Other *structural factors* lead to lack of diversity in computer science. For example, male students are more likely to have prior programming skills – linked to boys being more likely to have access to computers at home and at school.²¹ Students of color in the U.S. have less access to computer science learning opportunities at school, with lower-income students and Black students having the least access.²² Hispanic students have less access to computers with Internet access at home²³ than white and Black students.²⁴

All of this can impact *confidence*. Girls underestimate their own capabilities and believe that male majors have higher GPAs, which is not true. While Black and Hispanic/Latinx students have a positive perception of their computer science abilities,²⁵ female students of all races have confidence levels at roughly 70% as that of men.²⁶ This further erodes over time. This is partly due to *harassment* – 20-50% of female students in STEM and over 50% of female faculty in STEM report experiencing harassment. LGBTQ women and women of color are more likely to be harassed.²⁷

Then there are *challenges within technology workplaces*. There is a belief that Silicon Valley workplaces are meritocracies. But in organizations that are explicitly presented as meritocratic, managers favor male employees over equally qualified female employees. Many men in the tech industry simply don't notice how male dominated the industry is.²⁸ Men are twice as likely to blame the pipeline for the diversity problem in the technology industry than women.²⁹ One in four founders said they weren't interested in diversity or work-life balance at all.³⁰

Bias is present in recruitment and hiring of women and people of color. Individuals are attracted to those with whom they share something in common³¹. This extends to organizations, which tend to recruit

in their own image.³² Hiring tools perpetuate the status quo too, and can be covertly biased against women and people of color.³³

This *bias extends to promotion and leadership opportunities* within technology companies. Men and “masculinity” are generally associated with leadership. These leadership stereotypes lead to “lack of fit” perceptions for females in leadership positions.^{34 35} On the technical side – attributes, behaviors and skills that engineers are rewarded for tend to include assertiveness, aggressiveness and a “pick-it-apart urge” – things associated with masculinity. Meanwhile, other qualities are undervalued such as collaboration and willingness to listen – skills that can be perceived as more “feminine”.³⁶ People of color also take longer to get promoted.

Harassment and sexism in the technology industry is well known and documented, particularly in Silicon Valley.^{37 38} This is reflected in the 2018 walkout of 20,000 Google employees to protest the company’s payouts to executives accused of sexual harassment.³⁹ Discrimination can be overt or subtly embedded – such as through language in job descriptions that signals traditionally “masculine” or “feminine” traits. Hostility extends to family planning, pregnancy⁴⁰ and breastfeeding⁴¹. Women – particularly of color – experience significantly more unfair treatment than men. People of color also experience prevalent unfair treatment.⁴² LGBTQ tech workers were the most likely to experience bullying and hostility. A majority of queer employees (64%) said bullying contributed to their decision to leave.⁴³

Policies and practices in the workplace require a redesign. Women in heterosexual couples still do most of the family-related work and are more willing to prioritize their partners’ career over their own (stemming from traditional gendered roles and stereotypes).⁴⁴ Even women in senior leadership positions who have male partners are five times more likely than their partners to do all or most of the household work.⁴⁵ It is not surprising that women experience higher levels of work family conflict than men.⁴⁶

Women of color and single mothers face greater unpaid care pressures. Research from LeanIn.org and Survey Monkey during COVID-19 find that Latina and Black women are spending an average of 4 to 12 more hours per week on childcare than white women, and 15 to 20 more hours per week caring for elderly or sick relatives. Similarly, single mothers are spending significantly more time on housework than women overall.⁴⁷

Even if supportive policies around flexible work, caretaking, and paid leave are available, discrimination can be reinforced unintentionally through how they are implemented. Many workplaces are expanding leave for caretaking responsibilities during COVID-19. People who take advantage of this – likely more female employees given gender norms around caretaking – might be inadvertently penalized in performance reviews or looked over for promotions.

This isn’t just a “women’s” issue. Fathers who adopt roles that have been considered feminine, such as caregiving, may find that they are penalized because societal norms still haven’t shifted.⁴⁸ This can be particularly challenging for gay men who may not only be penalized for this, but also tend to receive less paid parental leave than lesbian or heterosexual couples.⁴⁹

Additional workplace challenges that discourage women and people of color from careers in data science and AI include but aren’t limited to *pay gap*, *office culture* and *lack of access to mentors and sponsors*. Like aforementioned challenges, these are exacerbated for women of color. Gender pay gaps are well documented. Black employees receive salary offers averaging \$10,000 less than offers to White peers.⁵⁰ Many Black employees also experience a “Black tax”, which is additional work such as representing the company at career fairs for which they do not receive extra pay.⁵¹ Further, being outspoken on diversity issues can also backfire against female employees and employees of color. During COVID-19, women and people of color are being laid off more as they are often in lower-level positions or have shorter tenures at the company. A survey by TrustRadius found that women in tech are 1.6x as likely to be laid off or furloughed than men.⁵²

Issues related to diversity, equity, and inclusion are interconnected and cyclical. With fewer women, people of color and other individuals from underrepresented groups in positions of power come fewer opportunities to reform the subtle or more obvious forms of discrimination. The various disparities in the workplace perpetuate lack of diverse role models and segregation in the job market, which further leads to perceptions of certain identities as less technically competent and perpetuates gender stereotypes that are engrained early in life.⁵³

The need to incorporate expertise beyond STEM

It can't be left to or expected of diverse individuals to catch biases or fairness issues that might be present in AI systems. Individual gender or racial identity doesn't protect you from having biases, stereotypes and prejudices. Ruha Benjamin, author of *Race After Technology*, notes: one "could expect a Black programmer, immersed as she is in the same systems of racial meaning and economic expediency as the rest of her co-workers to code software in a way that perpetuates racist stereotypes."⁵⁴ Biases in AI systems are linked to larger structural inequities and biases in society that can be very hard to identify.

Engaging individuals in the social sciences and humanities – as well as domain experts⁵⁵ – is important. Disciplines like economics, philosophy and sociology include critical skills important for developing and managing AI systems. Data scientists and engineers working on ML algorithms can have critical blind spots related to bias and fairness.⁵⁶ Social scientists are trained to think critically about structural inequities and social systems. They have a key role in thinking through different ways AI systems can impact communities and preempting issues that may arise. With this recognition – multidisciplinary, diverse teams are becoming more common.⁵⁷

Existing talent management practices will need to be updated to support and enable staff from these other educational backgrounds. Performance reviews currently focus more on product users growth and engagement, as opposed to how the product affects those users or society more broadly.⁵⁸ Updating performance management to be conducive to supporting and growing multidisciplinary teams is important⁵⁹ (see Play 2).

Also, in tech there tends to be a hierarchy of whose opinions matter: those with engineering and computer science backgrounds are at the top. Leadership being explicit about prioritizing responsibility and valuing social science expertise is important (see Play 5).

This play is part of [Mitigating Bias in AI: An Equity Fluent Leadership Playbook](#) of the Berkeley Haas Center for Equity, Gender and Leadership. It was written by Genevieve Smith, with input from Ishita Rustagi and Kellie McElhaney.



Endnotes

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