Systemic Barriers in Technology: Striving for Equity and Access
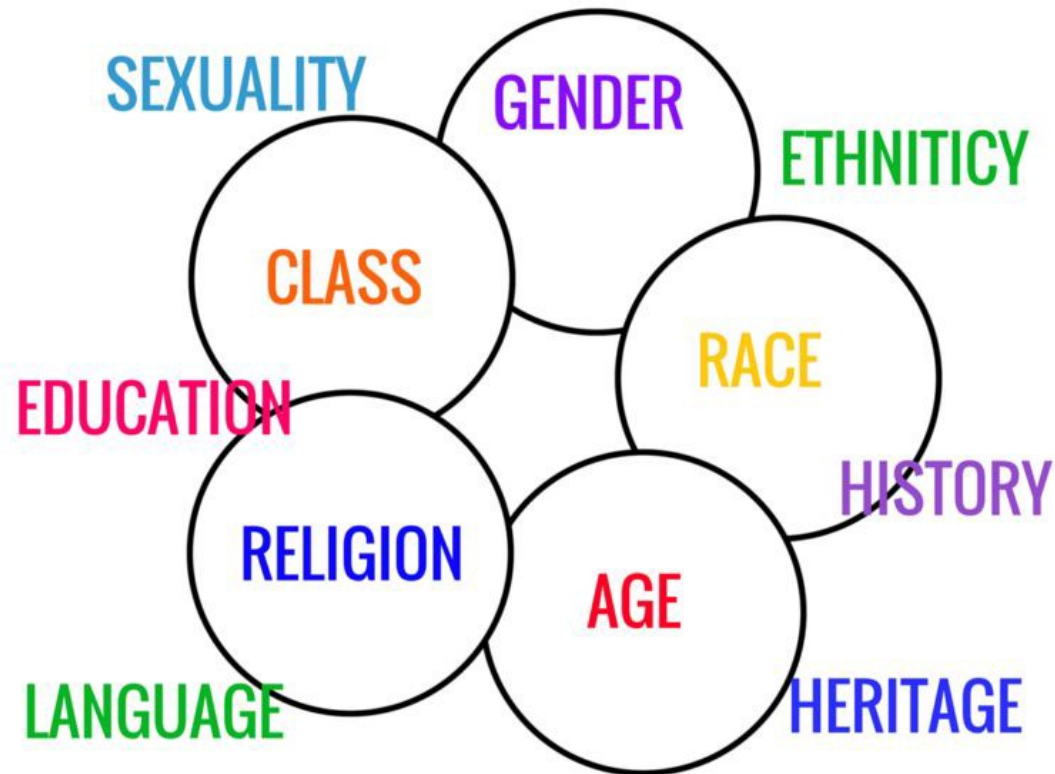

Tyrone Grandison
Chief Technology Officer
Pearl Long Term Care Solutions, Inc.
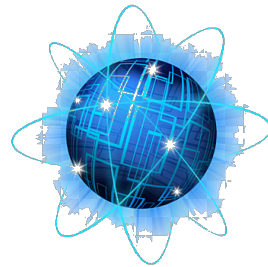
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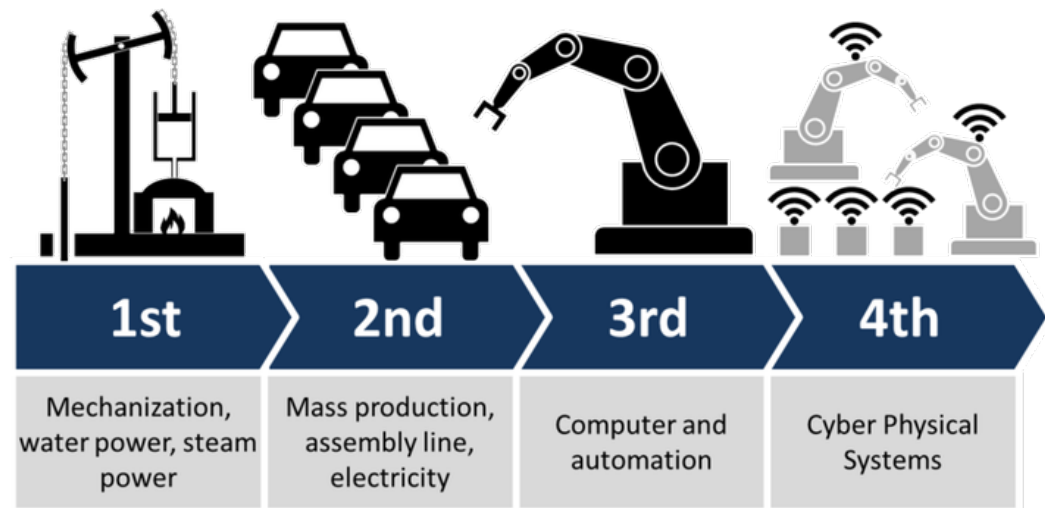
INTERSECTIONALITY

SEXUALITY

GENDER

ETHNITICY

CLASS

RACE

EDUCATION

HISTORY

RELIGION

AGE

LANGUAGE

HERITAGE

"overlapping or intersecting social identities and related systems of oppression, domination, or discrimination."

Technology

- the application of scientific knowledge for practical purposes, especially in industry.

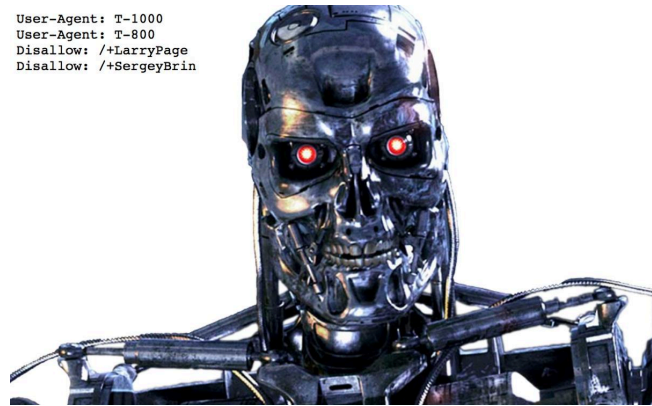- machinery and equipment developed from the application of scientific knowledge.

1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation	Cyber Physical Systems

The Nature of Technology

Tech X is **Good**

User-Agent: T-1000
User-Agent: T-800
Disallow: /+LarryPage
Disallow: /+SergeyBrin

Tech Y is **Bad**

Technology's Environment

Institutional Racism

the systematic distribution of resources, power and opportunity in our society to the benefit of people who are white and the exclusion of people of color

Institutional Sexism

the systematic distribution of resources, power and opportunity in our society to the benefit of people who are white and male and the exclusion of women
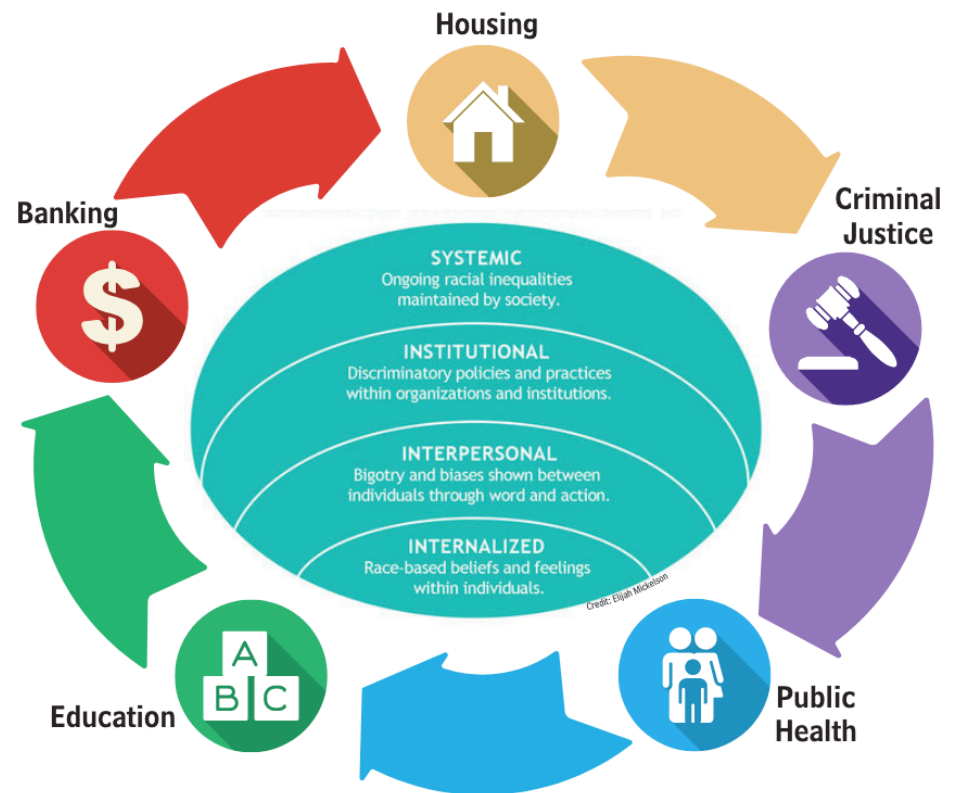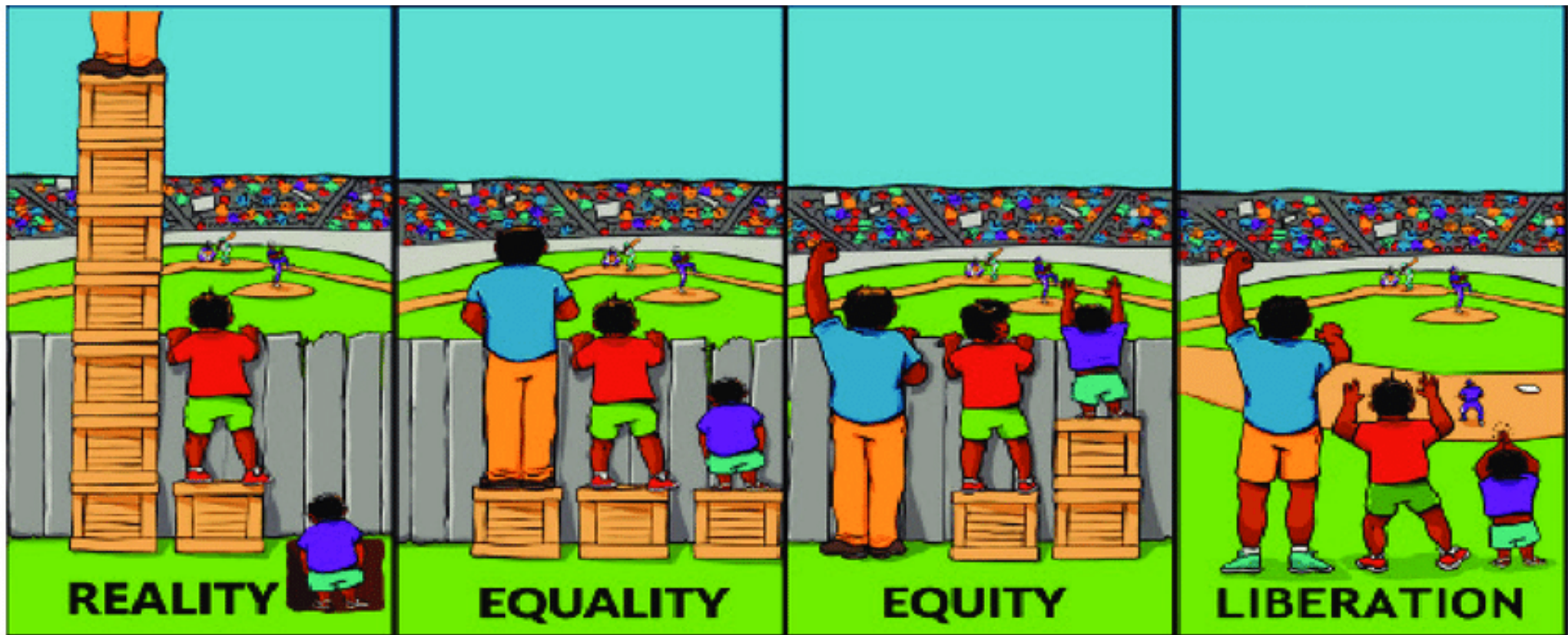
Hard Truths

Your Innate Benefits = **f(**Your proximity to whiteness**)**

Your Visibility of System Inequities =
**f(**Your proximity to whiteness**)**

Source: Lynch, Shrehan & Sutherland, Sue & Walton-Fisette, Jennifer. (2020). The A-Z of Social Justice Physical Education: Part 1. Journal of Physical Education, Recreation & Dance. 91. 10.1080/07303084.2020.1724500.

Systemic Barriers in Technology

- **People**
- **Policies**
- **Processes**
- **Institutions**
- **Practices**

Women scarce in computer science

The percentage of computer science degrees awarded to women surged from the early 1970s until the mid-1980s, but then went into a long decline. The current percentage is less than half of what it was in 1983-84.

1983-84:
37.1% female

2010-11:
17.6% female
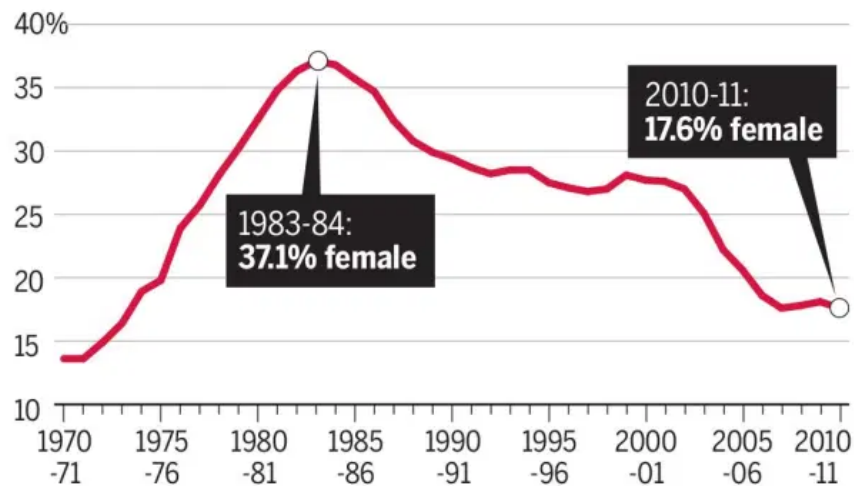
Source: Department of Education, National Center for Education Statistics

KARL KAHLER/BAY AREA NEWS GROUP

Women in Computer Science & Tech

— % of computer and mathematics jobs held by women

— % of computer science bachelor's degrees awarded to women

GeekWire

PRE K – 12
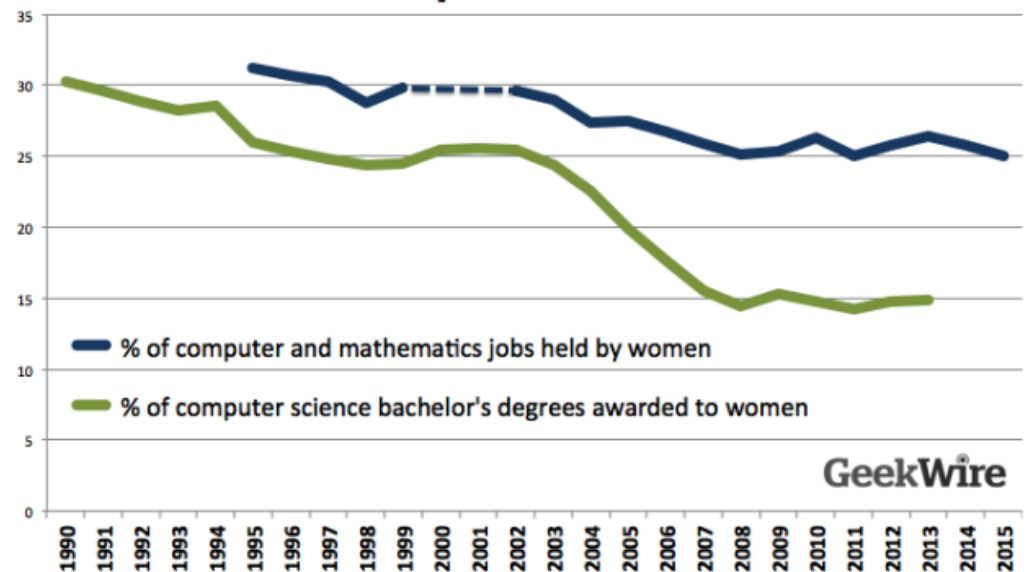
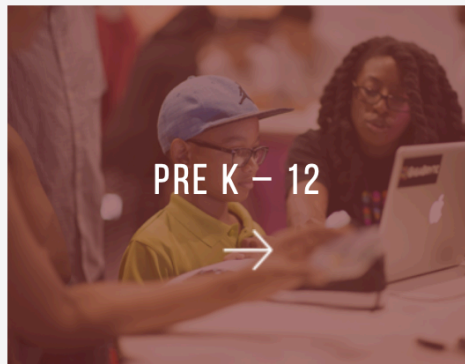The tech talent pipeline starts early with the development of math and computational thinking skills and building interest in computing fields...and so do disparities in access and outcomes.

HIGHER EDUCATION

In higher education, a variety of barriers affect the preparation, interest, motivation, and persistence of students in computing, resulting in wide gaps by gender and race/ethnicity in Bachelor's degree completion.

TECH WORKFORCE

Biases in recruiting, hiring, retention and workplace culture contribute to substantial racial/ethnic and gender disparities in the tech workforce.

ENTREPRENEURSHIP

Cumulative economic barriers and biases in entrepreneurship pathways affect the opportunities for diverse entrepreneurs to launch products and companies and invest in revenue-generating and social impact ventures.

Source: Kapor Center

Cognitive Biases

1. Anchoring bias.

People are **over-reliant** on the first piece of information they hear. In a salary negotiation, whoever makes the first offer establishes a range of reasonable possibilities in each person's mind.

2. Availability heuristic.

People **overestimate the importance** of information that is available to them. A person might argue that smoking is not unhealthy because they know someone who lived to 100 and smoked three packs a day.

3. Bandwagon effect.

The probability of one person adopting a belief increases based on the number of people who hold that belief. This is a powerful form of **groupthink** and is reason why meetings are often unproductive.

4. Blind-spot bias.

Failing to recognize your own cognitive biases is a bias in itself. People notice cognitive and motivational biases much more in others than in themselves.

5. Choice-supportive bias.

When you choose something, you tend to feel positive about it, even if that **choice has flaws**. Like how you think your dog is awesome — even if it bites people every once in a while.

6. Clustering illusion.

This is the tendency to **see patterns in random events**. It is key to various gambling fallacies, like the idea that red is more or less likely to turn up on a roulette table after a string of reds.

7. Confirmation bias.

We tend to listen only to information that confirms our **preconceptions** — one of the many reasons it's so hard to have an intelligent conversation about climate change.

8. Conservatism bias.

Where people favor prior evidence over new evidence or information that has emerged. People were **slow to accept** that the Earth was round because they maintained their earlier understanding that the planet was flat.

9. Information bias.

The tendency to **seek information when it does not affect action**. More information is not always better. With less information, people can often make more accurate predictions.

10. Ostrich effect.

The decision to **ignore dangerous or negative information** by "burying" one's head in the sand, like an ostrich. Research suggests that investors check the value of their holdings significantly less often during bad markets.

11. Outcome bias.

Judging a decision based on the **outcome** — rather than how exactly the decision was made in the moment. Just because you won a lot in Vegas doesn't mean gambling your money was a smart decision.

12. Overconfidence.

Some of us are **too confident about our abilities**, and this causes us to take greater risks in our daily lives. Experts are more prone to this bias than laypeople, since they are more convinced that they are right.

13. Placebo effect.

When **simply believing** that something will have a certain effect on you causes it to have that effect. In medicine, people given fake pills often experience the same physiological effects as people given the real thing.

14. Pro-innovation bias.

When a proponent of an innovation tends to **overvalue its usefulness** and undervalue its limitations. Sound familiar, Silicon Valley?

15. Recency.

The tendency to weigh the **latest information** more heavily than older data. Investors often think the market will always look the way it looks today and make unwise decisions.

16. Salience.

Our tendency to focus on the **most easily recognizable features** of a person or concept. When you think about dying, you might worry about being mauled by a lion, as opposed to what is statistically more likely, like dying in a car accident.

17. Selective perception.

Allowing our expectations to **influence how we perceive** the world. An experiment involving a football game between students from two universities showed that one team saw the opposing team commit more infractions.

18. Stereotyping.

Expecting a group or person to have certain qualities without having real information about the person. It allows us to quickly identify strangers as friends or enemies, but people tend to **overuse and abuse** it.

19. Survivorship bias.

An error that comes from focusing only on surviving examples, causing us to **misjudge a situation**. For instance, we might think that being an entrepreneur is easy because we haven't heard of all those who failed.

20. Zero-risk bias.

Sociologists have found that **we love certainty** — even if it's counterproductive. Eliminating risk entirely means there is no chance of harm being caused.

White Privilege & Institutional Racism embedded in US Policy

- Contrary to Government claims, the US Constitution does not offer adequate or clear protection, assurances or remedies for victims.
- The US legal standard requiring that victims of discrimination prove "intent" to discriminate as a condition of remedy is a major barrier to addressing racial inequity.

- No central coordination, oversight and management on inequity and discrimination.
- The current system of white privilege has its roots in the US conquest and oppression of indigenous peoples and the US role in the Trans-Atlantic slave trade.

Source: TransNational Racial Justice Initiative. "[The Persistence of White Privilege and Institutional Racism in US Policy - A Report on US Government Compliance with the International Convention on the Elimination of All Forms of Racial Discrimination](#)". March 2001.