THE ACCESSIBILITY AND TECH CYCLE

Emily E. Ackerman
University of Pittsburgh
Slides at emilyeackerman.netlify.com

STEM and Society Lectures,
*Pitt Graduate Student Organizing Committee*
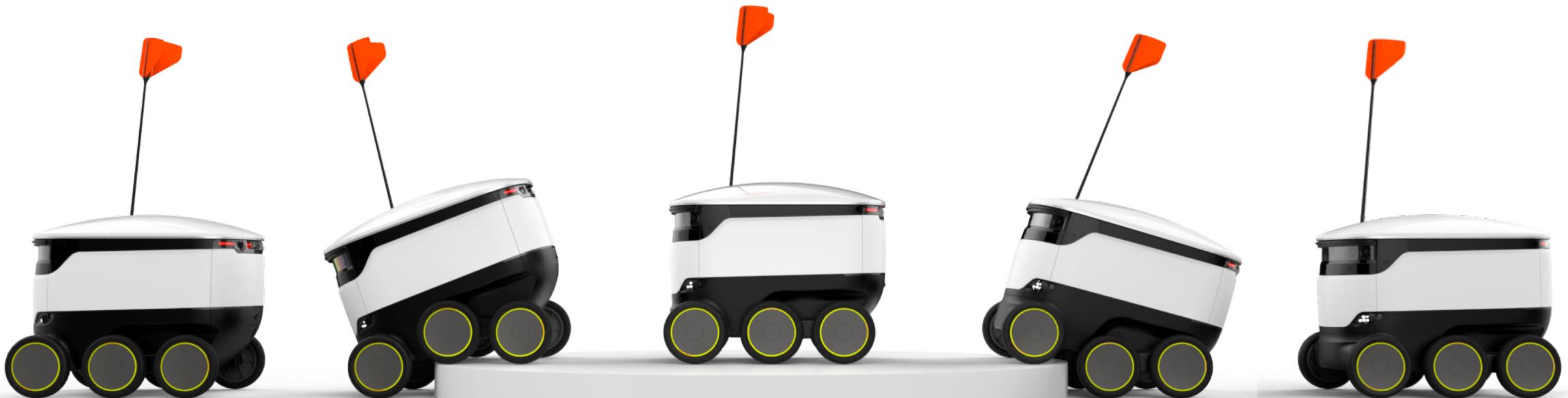
WHO AM I?

6th year PhD Candidate,
Department of Chemical Engineering

Lifetime wheelchair user

WHAT HAPPENED?

WHAT HAPPENED?

PITT'S FOOD DELIVERY ROBOTS ON HOLD
STUDENT IN WHEELCHAIR SAY THEY POSE A SAFETY RISK

NEW ON 4

PITTSBURGH'S ACTION NEWS 4

-0:56

☰ SHOW TRANSCRIPT

Food delivery robot pauses operations after Monday incident

Emily Ackerman relies on a wheelchair for mobility and was trapped on Forbes Avenue when robot wouldn't move

PITTSBURGH'S
Action
News 4

Updated: 7:13 PM EDT Oct 22, 2019

THE ENCOUNTER

Emily Slackerman Ackerman
@EmilyEAckerman

i (in a wheelchair) was just trapped *on* forbes ave by one of these robots, only days after their independent roll out. i can tell that as long as they continue to operate, they are going to be a major accessibility and safety issue. [thread]

Everything we know about the Starship food delivery robots - The Pitt News
pittnews.com

3:27 PM · 10/21/19 · Twitter Web App

View Tweet activity

3,121 Retweets **4,329** Likes

Emily Slackerman Ackerman @EmilyEAckerman · 10/21/19
hey @StarshipRobots what are you doing about this? hey @PittTweet what are you doing about this?

17   314   1,934

University of Pittsburgh ✓
@PittTweet

Replying to @EmilyEAckerman and @StarshipRobots

We have paused testing to review the technology further and ensure everyone's safety. We value your feedback and someone from Pitt will be in touch to learn more about your experience.

5:40 PM · 10/21/19 · Twitter Web App

7 Retweets **283** Likes

The sympathizing, worrying crowd

Mark Mandel
@markjmandel

I spotted @StarshipRobots at @UWMadison today — do they block wheelchair access here too? If so they should be out of service until this issue is fully addressed. twitter.com/emilyeackerman...

Zachary Baiel
@baielala

I still don't know how they are legally operating on the pedestrian only sidewalks.

The ordinances are very clear on this.

This is from Pittsburgh, but we have the same robots here.

Share your stories.

Jason Snell ✓
@jsnell

Spotted a robot (or not) on the streets of Berkeley yesterday.

oc-taber ☠
@taber

Students and staff at George Mason University have raised this flag - the delivery robots *CAN not and WILL not* get out of the way of people using wheelchairs - and it's terrifying that institutions are *still* signing up to voluntarily permit these things.

🏳️‍🌈 **Cy(berpunk) is anticapitalist**
@cyrusinitaly

Replying to @EmilyEAckerman

Just had one partially block the accessibility ramp to one of the dining halls at @UWMadison. One person at a time could walk around, but no way a wheelchair could get around. Also likely a fire escape hazard/block.

Tart of Darkness
@theinfophile

We have similar ones in Berkeley. They're always hogging the ramps.

The sympathizing, worrying crowd

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@markjmandel

I spotted @StarshipRobots at @UWMadison today — do they block wheelchair access here too? If so they should be out of service until this issue is fully addressed. twitter.com/emilyeackerman...

The tech/design crowd

Jared, INTERNATIONAL THOUGHT...
@jaredtm

Replying to @EmilyEAckerman

This is so upsetting. The people behind initiatives like this *should* be aligned advocates for accessibility. You can tell from what they made that they do not have a diverse group of human centered designers behind the wheel there.

The disabled crowd

ace tilton ratcliff
@MortuaryReport

thread. this is, per usual, an issue of inaccessibility likely bc there were no disabled humans consulted/hired. i would not be surprised to learn engineers did not know history of curb cuts related to wheelchairs. @StarshipRobots, how are you fixing this? #HellaInaccessible
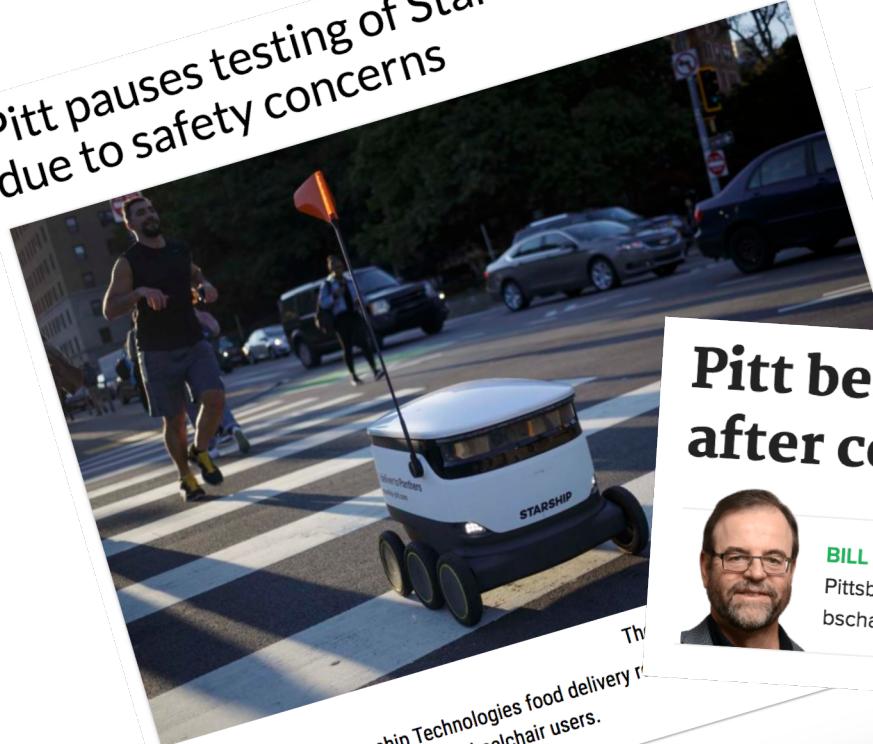
The well meaning, sometimes ableist crowd

Christine Casalini
@queen2knight

We need to innovate with accessibility in mind. Also do we really need food delivery robots???????

Pitt pauses testing of Starship robots due to safety concerns

The testing of the Starship Technologies food delivery r... over potential safety issues for wheelchair users.

Food Delivery Robots Pulled From Pitt Campus After Backlash About Mobility

By KATHLEEN J. DAVIS • OCT 22, 2019

90.5
WESA

Pitt benches food-delivery robots after complaint from a student

BILL SCHACKNER ✓
Pittsburgh Post-Gazette
bschackner@post-gazette.com 🐦

OCT 23, 2019 | 3:52 PM

PITT'S FOOD DELIVERY ROBOTS ON HOLD
STUDENT IN WHEELCHAIR SAY THEY POSE A SAFETY RISK
NEW ON 4
-0:56

SHOW TRANSCRIPT

...livery robot pauses operations ...after Monday incident

...an relies on a wheelchair for mobility ...pped on Forbes Avenue when robot wouldn't move

PITTSBURGH'S
ACTIO...

Progress is complicated: Pitt student starts dialogue on technology, accessibility

Experiments with new technologies should not come at the expense of safety or accessibility

Ms. Ackerman is to be commended for sparking the conversation about the intersection of technology and accessibility. Having worked extensively at

The food-delivery robots only served their stated purpose for a short time, causing quite a dust-up in the process. But the conversations, ideas and progress they have provoked have been well worth the controversy.

My Fight With a Sidewalk Robot

A life-threatening encounter with AI technology convinced me that the needs of people with disabilities need to be engineered into our autonomous future.

NOVEMBER 19, 2019

EMILY ACKERMAN
Ph.D. student and disability rights advocate

NATIONAL GEOGRAPHIC

arirang
아리랑국제방송

GONZAGA UNIVERSITY
DEO PATRIÆ, SCIENTIIS, ARTIBUS
IHS
A.M. D.G.
SCHOOL OF LAW

Hi Emily,

The delivery robots are currently traveling around the [School] campus, and have already endangered one of my advisee's life (he uses a wheelchair).

FINANCIAL TIMES   myFT

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Work & Careers   + Add to myFT

How to design AI that eliminates disability bias

Tackling the multi-faceted needs of employees requires new learning systems

© Stephanie Strasburg/FT

Alicia Clegg JANUARY 26 2020   💬 4 🖨
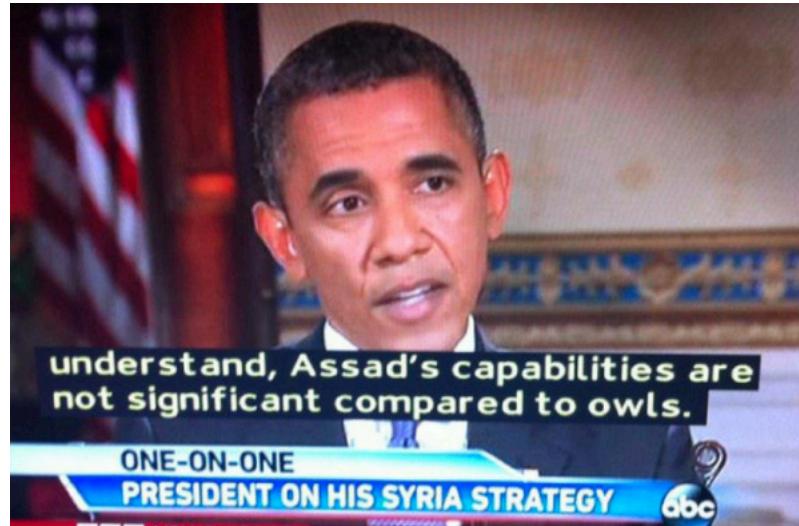
HOW DID WE GET HERE?

HOW IS TECHNOLOGY SO ACTIVELY INACCESSIBLE?

Websites with informational images

For for printable PDF, please click *here*.

Dockless motorized scooters

understand, Assad's capabilities are not significant compared to owls.

ONE-ON-ONE
PRESIDENT ON HIS SYRIA STRATEGY

Unreliable or nonexistent subtitles

HOW ARE ACCESSIBLE SOLUTIONS SO ACTIVELY INACCESSIBLE?

$60

$100

Xbox controller

Adapted Xbox controller

HOW ARE ACCESSIBLE SOLUTIONS SO ACTIVELY INACCESSIBLE?

$40k

Exoskeleton

$40k

Stair Climbing Wheelchair

HOW CAN PEOPLE WITH DISABILITIES STILL BE SO FAR BEHIND?

15% of the world's adults are disabled (>1 bil)[1]

Median earnings, US, 2015:
$21,572 (abled: $31,872)[2]

Internet users, US, 2015: 54% (Abled: 81%)[2]

[1]WHO World Report On Disability, 2011
[2]Americans Living with Disability, Pew Research Center, 2015

HOW CAN PEOPLE WITH DISABILITIES STILL BE SO FAR BEHIND?

15% of the world's adults are disabled (>1 bil)[1]

Undergraduate population in STEM with disability, US, 2019: 11%[3]

Doctoral degrees awarded to those in STEM with disabilities, US, 2019: 6.8%[4]
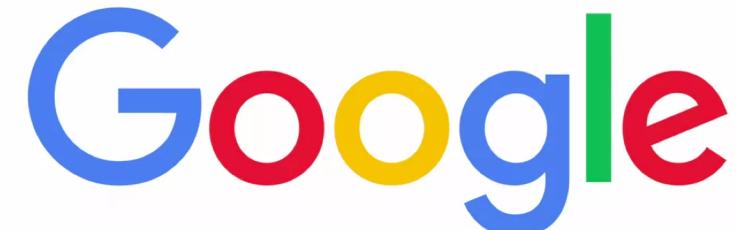
[1]World Report On Disability, WHO, 2011
[3]National Center for Education Statistics
[4]Women, Minorities, and Persons with Disabilities in Science and Engineering, NSF, 2012

HOW CAN PEOPLE WITH DISABILITIES STILL BE SO FAR BEHIND?

15% of the world's adults are disabled (>1 bil)[1]

7.5% self-identified as having a disability[5]
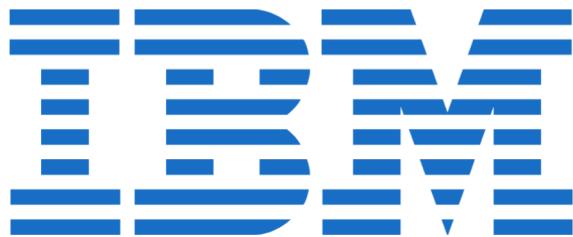
(Note: 2019 is first year reporting)

[1]*World Report On Disability, WHO, 2011*
[5]*Google diversity annual report 2019*

HOW CAN PEOPLE WITH DISABILITIES STILL BE SO FAR BEHIND?

Companies touting "disability inclusion" without providing employment statistics

IBM

amazon

The Amazon blog

☰ **dayone**   Reading Now   Why we choose to include

Community
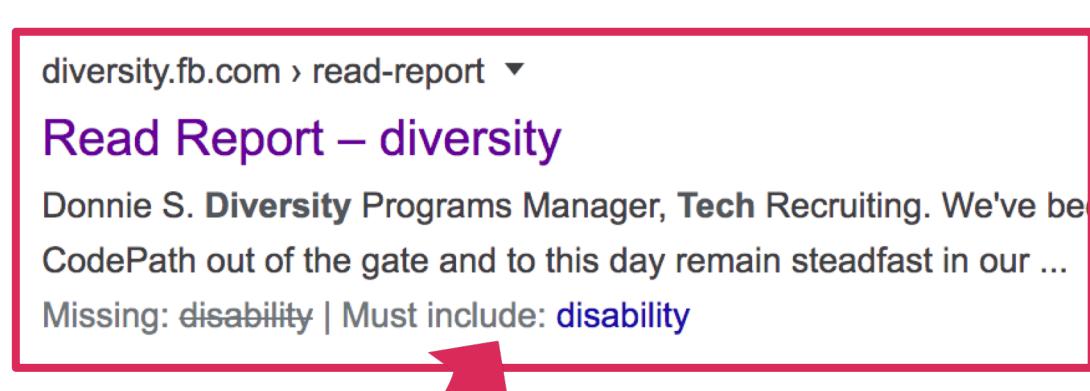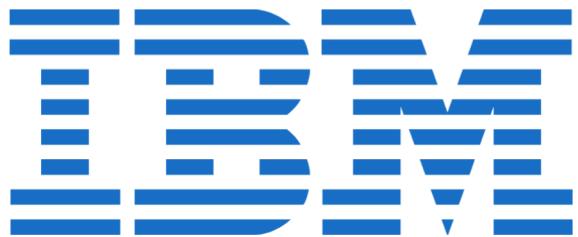
Why we choose to include

Helping people with disabilities find employment is part of Amazon's commitment to increase diversity and inclusion in the workplace.

By Neal Karlinsky on June 12, 2018
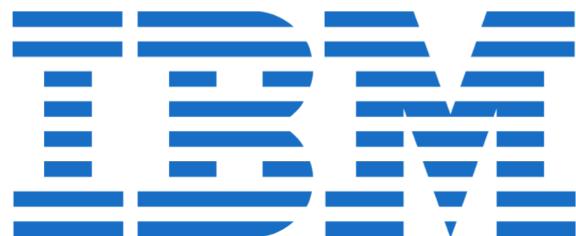
HOW CAN PEOPLE WITH DISABILITIES STILL BE SO FAR BEHIND?

Companies touting "disability inclusion" without providing employment statistics

IBM

amazon

ORACLE®

facebook
named
"2018 Best Place to Work for Disability Inclusion"
by the **DEI** DISABILITY™ EQUALITY INDEX
Best Place To Work For Disability Inclusion

diversity.fb.com › read-report ▾
Read Report – diversity
Donnie S. **Diversity** Programs Manager, **Tech** Recruiting. We've be
CodePath out of the gate and to this day remain steadfast in our ...
Missing: ~~disability~~ | Must include: disability

f

HOW CAN PEOPLE WITH DISABILITIES STILL BE SO FAR BEHIND?

Companies touting "disability inclusion" without providing employment statistics
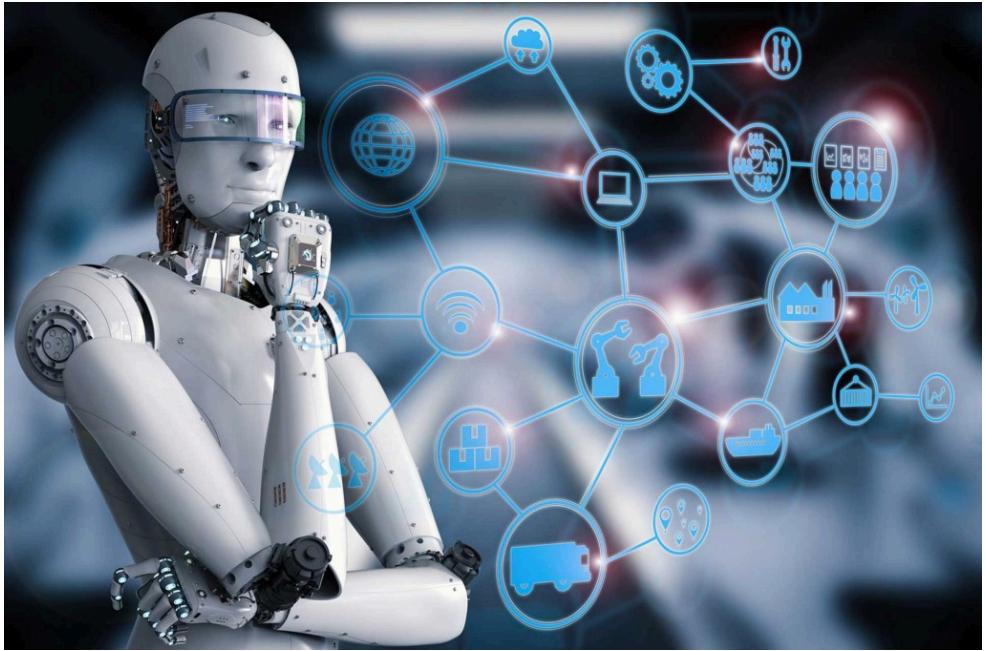
(I don't have all day to look it up but you get the idea)

WE HAVE ALWAYS RELIED ON TECH
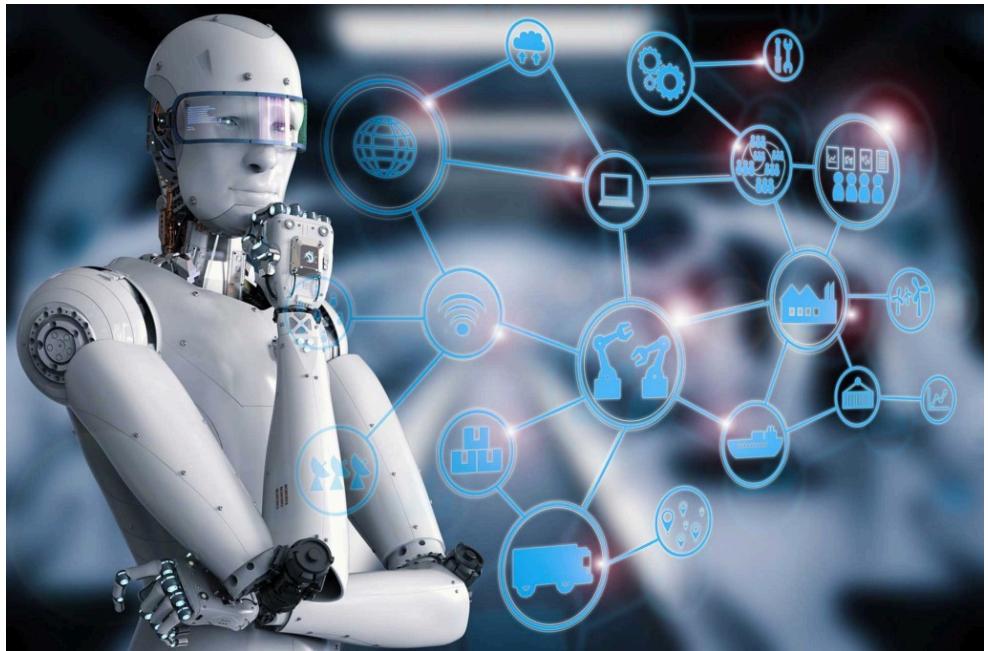
Tech, 2020

Tech, 1960
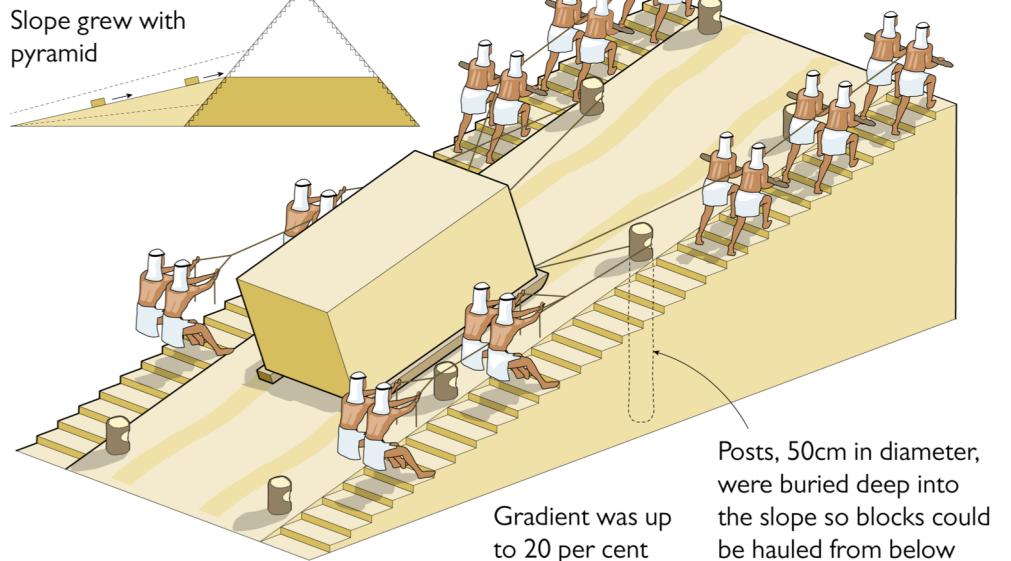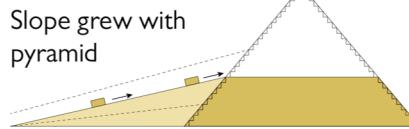
WE HAVE ALWAYS RELIED ON TECH

Tech, 2020

Tech, 2500 BC

Step-by-step guide

Slope grew with pyramid

Gradient was up to 20 per cent
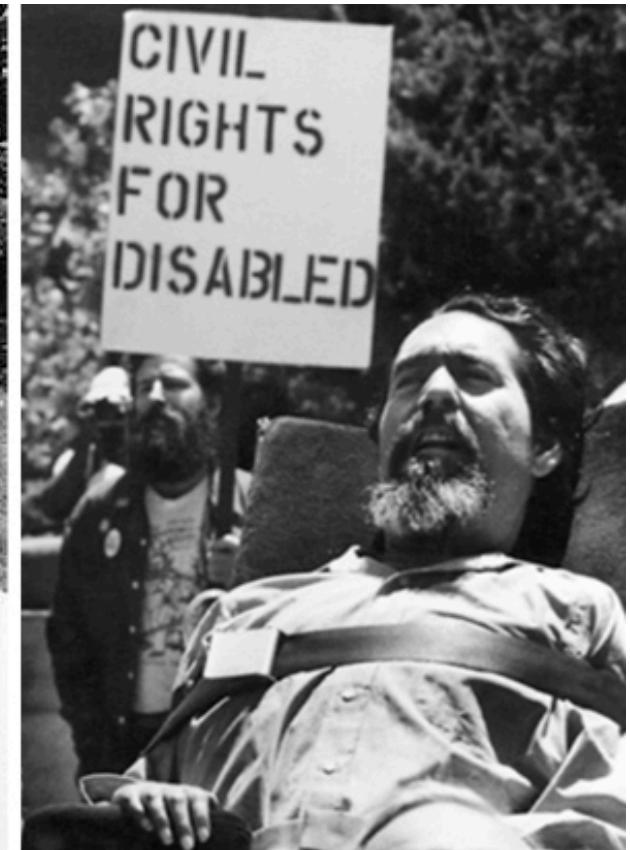
Posts, 50cm in diameter, were buried deep into the slope so blocks could be hauled from below

ACCESS TO TECH AND EDUCATION HAS HISTORICALLY BEEN LIMITED

Ed Roberts

First student at Berkley in a wheelchair, 1962

Forced to live in hospital by university

Led the fight for curb cuts in the city

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ACCESS TO TECH AND EDUCATION HAS HISTORICALLY BEEN LIMITED

Protests for the Rehabilitation Act of 1973

THE ADA (1990)

Covers:

Employment discrimination
- "Reasonable accommodations"

Public entities and accommodations
- "readily achievable"
- "…easily accomplished without much difficulty or expense"
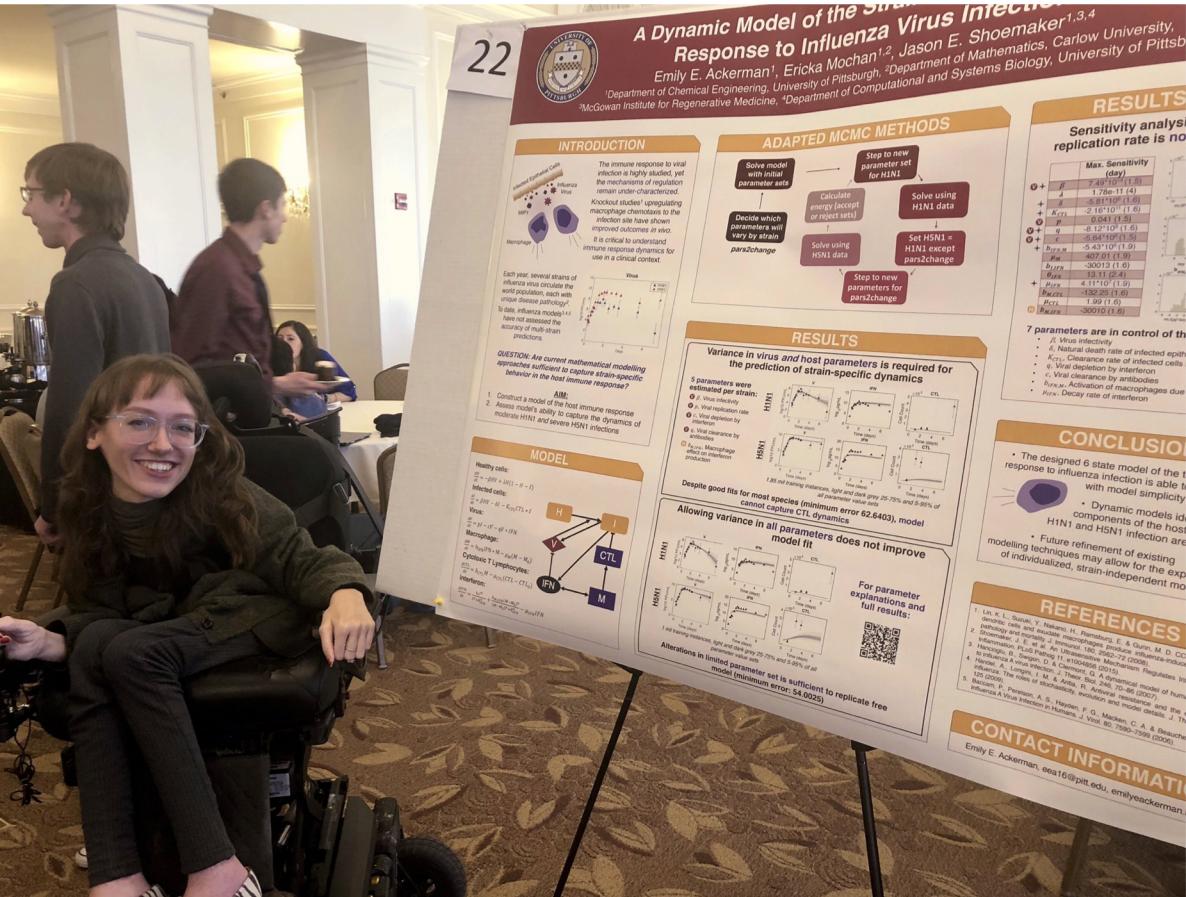
Telecommunications

THE RESULT:

THE RESULT:
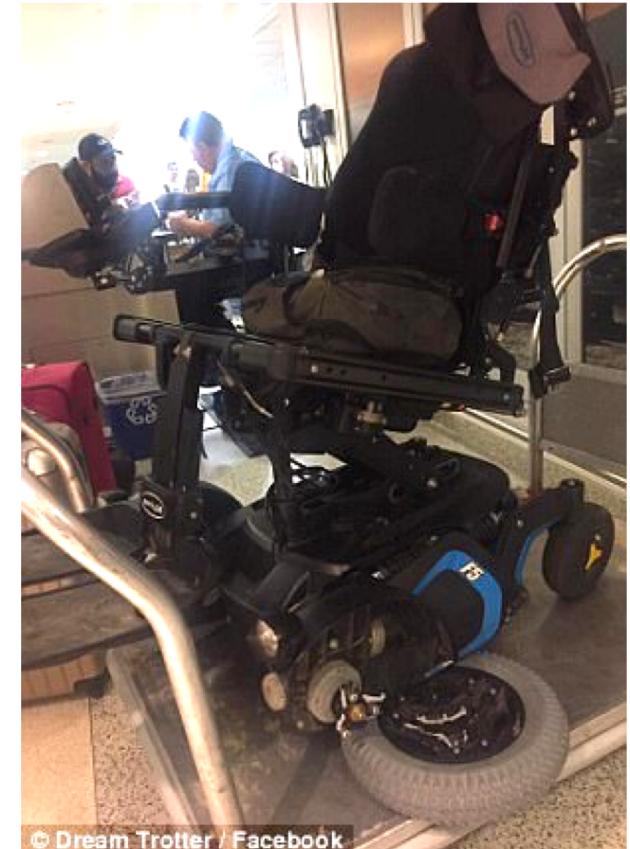
THE RESULT: AIR TRANSPORTATION

Air travel is a private industry that falls under the Air Carriers Access Act,1986

Problem:
Provides no private cause of action
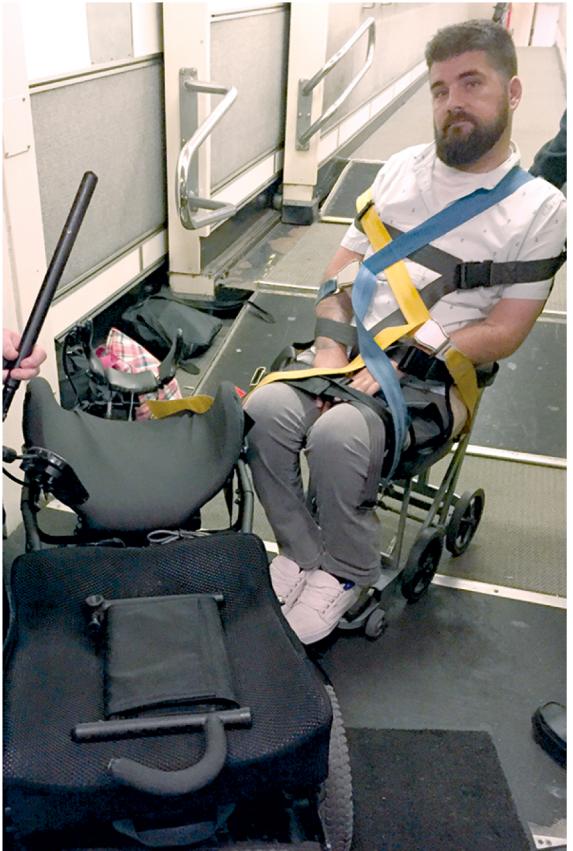
Individuals cannot file lawsuits based on violations

© Dream Trotter / Facebook

THE RESULT: AIR TRANSPORTATION

Air travel is a private industry that falls under the Air Carriers Access Act,1986
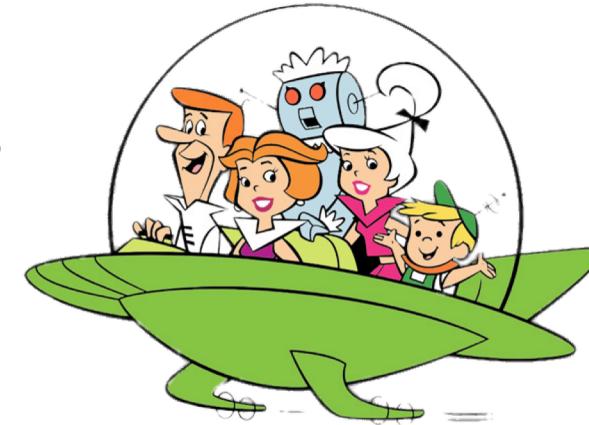

December, 2018:
701 wheelchairs and scooters were damaged by the 12 most popular US airlines

Decades of optimization hasn't guaranteed safety or respect to the disabled

THE PRESENT IS SCARY THEREFORE, THE FUTURE IS SCARIER

Where is the future of technology, robotics, AI, etc. headed?

Who's driving the spaceship?

"Where are the disabled engineers? I'd hire them if they existed!"

POOR REPRESENTATION IS CAUSED BY INACCESSIBILITY AT TWO LEVELS

REPRESENTATION

Developer access to industries

Equal access to tech for users

As a result, the tech industry is in a place where it **must** anticipate the needs of its users

# POOR REPRESENTATION IS CAUSED BY INACCESSIBILITY AT TWO LEVELS
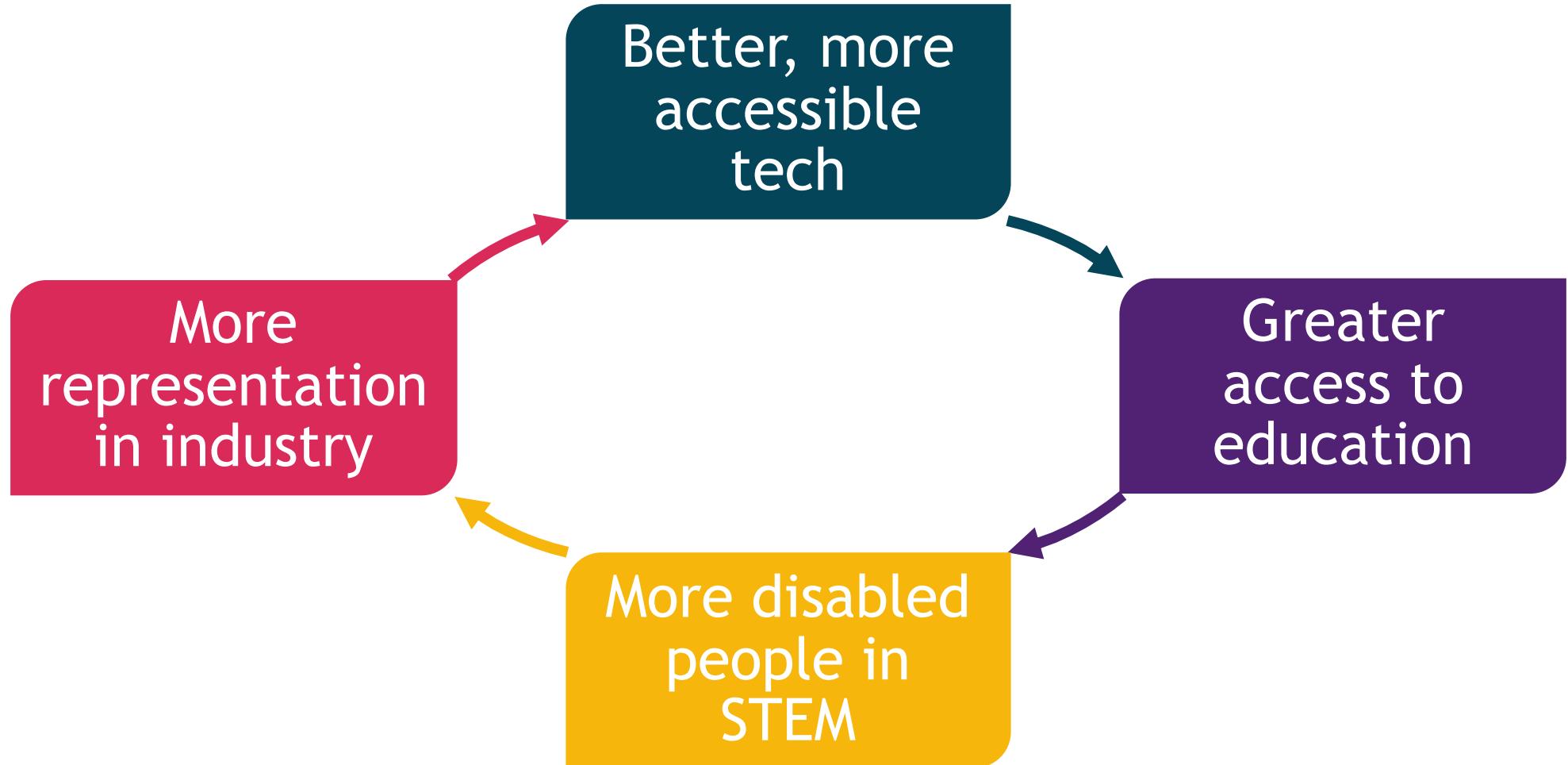
As a result, the tech industry is in a place where it **must** anticipate the needs of its users

The goal: A future where

1. abled developers aren't responsible for foreseeing a user experience they'll never have

2. the burden doesn't fall to the user to protest or rely the good faith of the developer

THIS IS A TEMPORARY PROBLEM
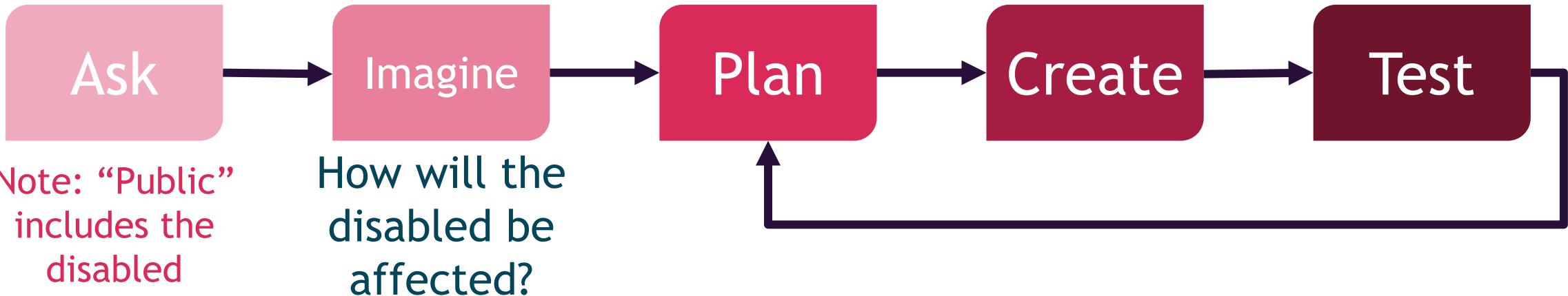
THE SOLUTION IS POSITIVE FEEDBACK

THE INDUSTRY MUST DIVERSIFY

Multilevel involvement in the design process is key

Who is the user? What are their needs?

Is the chosen solution serving minorities?

What is the user feedback?

Ask → **Imagine** → **Plan** → **Create** → **Test**

Note: "Public" includes the disabled

How will the disabled be affected?

THE INDUSTRY MUST DIVERSIFY

Multilevel involvement in the design process is key

Inaccessible solutions are harmful,
even when accidental or resulting from noble intention

Greater recognition of voluntary and involuntary users

THE INDUSTRY MUST SLOW DOWN

A harmful solution isn't good because it's first

Development is fast, reactionary legislation is slow

Design must be based in ethical decision making

We have no trust in "good faith"

"Move fast and break things" cannot come at the expense of the marginalized

EDUCATION MUST BECOME MORE ACCESSIBLE *(A WHOLE TALK IN ITSELF)*

What can you do in your department/company? in your community?

Do you/your family/your friends have disabled role models?

How can you make your work less of a black box for the public?

Public education on the future of tech is necessary

THIS IS A TEMPORARY PROBLEM

We in the disability community need:

Recognition of the disabled experience

Access to equitable, ethical solutions

Commitment from the tech to actively bring us inside

THANK YOU!

emilyeackerman.netlify.com   twitter.com/emilyeackerman   eea16@pitt.edu