

# ROBOTS HAVE FEELINGS TOO

A DISCUSSION ABOUT TECHNOLOGY REFLECTING THE COMMUNITIES THEY SERVE  
(AND BIASES THEY STILL HOLD)



**Dr. Racheida Lewis**

she/her

@Racheida\_Lewis



**Dr. Sreyoshi Bhaduri**

she/her

@ThatStatsGirl



Leo Lewis (he/him)

# Who is here today?



[tinyurl.com/NSFQ1](https://tinyurl.com/NSFQ1)

or

[menti.com 7691 9936](https://menti.com/76919936)



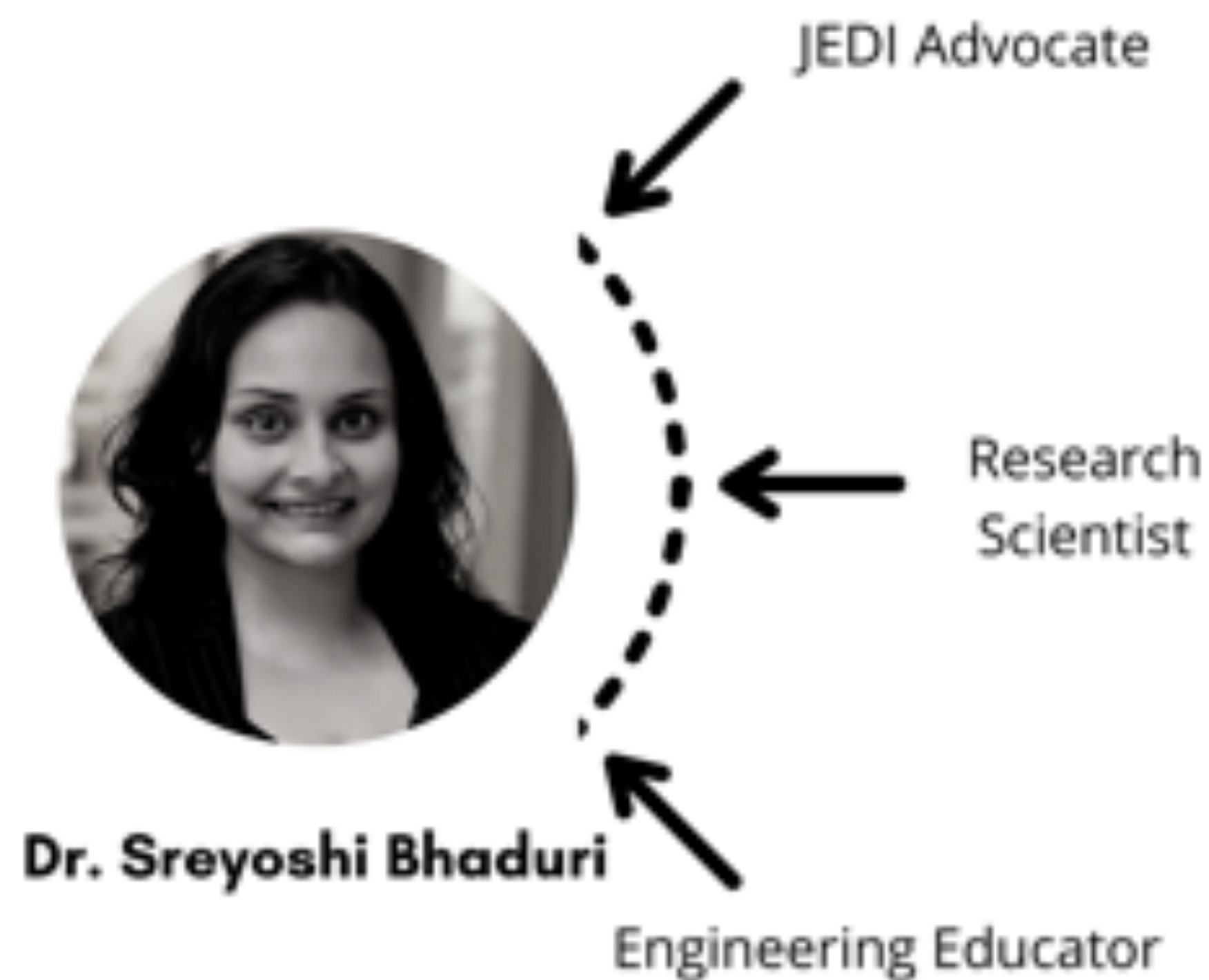
- Undergrad student
- Grad student
- Post Doc
- Admin
- Faculty
- Staff
- Other



@Richards\_Lewis



@HartmanJL



# ROBOTS HAVE FEELINGS TOO

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(AND BIASES THEY STILL HOLD)



@richards\_lewis



@hannahdial



# ROBOTS HAVE FEELINGS TOO

Publons 2020 Aug 27;16(8):e0257861 doi: 10.1371/journal.pone.0257861 eCollection 2020

Hate speech detection and racial bias mitigation in social media based on BERT model

Wardah Muzahid <sup>1</sup>, Ross Faridbainah <sup>1</sup>, Nadi Ghozal <sup>1</sup>

ARTICLE IN PRESS

AI and Robots Are a Minefield of Cognitive Biases > Humans anthropomorphize our technology, sometimes to our own distraction and detriment

ARTICLE IN PRESS

ARTICLE IN PRESS

Fake Pictures of People of Color Won't Fix AI Bias

Companies claim synthetic images can add diversity to AI data sets, but they carry functional and moral risks.



Hardly a day goes by without a new story about the power of AI and how it will change our world. However, there are also dangers alongside the possibilities. While we should be rightly excited by the idea of AI revolutionizing eye disease and cancer diagnosis, or the potential transport revolution promised by autonomous vehicles, we should not ignore the risks – and one of the most pressing of these is bias.

While self-driving vehicles, AI bias is unlikely to be the stuff of the next Hollywood blockbuster – and yet it is a potentially huge problem.

Linking sense of touch to facial movement inches robots toward 'feeling' pain

If robots can experience pain themselves, they might understand human pain better, too

By Stephanie Lee

These robots were trained on AI. They became racist and sexist.

An ethics review committee, researchers who conducted the study are concerned about the effects this might have on society.



AI researchers

ARTICLE IN PRESS

Flawed AI Makes Robots Racist, Sexist

JUN 23, 2020 - ATLANTA, GA

Some AI just shouldn't exist

Attempts to "fix" biased AI can actually harm black, gay, and transgender people.

By Stephanie Lee

On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?



by Lee et al.

Google engineer put on leave after saying AI chatbot has become sentient



AI researchers, Lewis



AI researchers, Lewis

# ROBOTS HAVE FEELINGS TOO

the more we anthropomorphise automation, the more we automate our biases, perceptions, emotions, prejudices, and combinations of the same, into our machines.



@richards\_lewis



@hannahdick

***As We Innovate the Future,  
Let's Make Sure We Aren't Merely  
Automating Our Biases!***



*Richards, Lewis*



*Thompson*

# JEDI can help!



richards\_lewis



thompsond



## Today we will...

- Define what JEDI means
- Understand why JEDI is important
- Strategize how to incorporate JEDI



Richard Lewis



Christina



**WHAT IS JEDI?**

**WHY IS IT  
IMPORTANT?**

**HOW CAN YOU  
INCORPORATE IT?**



@Brendan\_Lewis



@KathrynLofgren

# What comes to mind ?

Please share.

**J**ustice.

**E**quity.

**D**iversity.

**I**nclusion.

[tinyurl.com/JEDIQ2](https://tinyurl.com/JEDIQ2)



[menti.com 8125 2177](https://menti.com/81252177)



[@Brenda\\_Lewis](#)



[@HannahJ](#)

**Justice.** *Dismantling barriers to resources and opportunities for everyone to benefit from them.*

**Equity.** *Re-allocating resources and opportunities so that everyone has access.*

**Diversity.** *Differences between humans, based on which they experience advantages or encounter barriers.*

**Inclusion.** *Fostering a sense of belonging and amplifying voices, irrespective of background.*




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**WHAT IS JEDI?**



**WHY IS IT  
IMPORTANT?**



**HOW CAN YOU  
INCORPORATE IT?**



@Richard\_Lewis



@KathrynLof

**ROBOTIC  
PEACEKEEPERS**

**SELF-DRIVING  
CARS**

**MEDICAL  
DEVICES**



*I realized that, as I worked on improving AI task by task, dataset by dataset, that **I was creating massive gaps, holes and blind spots** in what it could understand. And while doing so, **I was encoding all kinds of biases**. Biases that reflect a limited viewpoint, limited to a single dataset -- biases that can reflect human biases found in the data, such as prejudice and stereotyping.*

*I thought back to the evolution of the technology that brought me to where I was that day -- how the first color images were calibrated against a white woman's skin, meaning that color photography was biased against black faces. And **that same bias, that same blind spot continued well into the '90s**. And the same blind spot continues even today in how well we can recognize different people's faces in facial recognition technology.*

*-Margaret Mitchell, AI Researcher*

from: [https://www.ted.com/talks/margaret\\_mitchell\\_how\\_we\\_can\\_build\\_ai\\_to\\_help\\_humans\\_not\\_hurt\\_us/transcript](https://www.ted.com/talks/margaret_mitchell_how_we_can_build_ai_to_help_humans_not_hurt_us/transcript)



@richards\_lewis  
@richards\_lewis



@thunderbird  
@thunderbird

How is *JEDI* relevant  
for you?



@richards\_lewis



@hannahdial





# Experiences on teams: struggling with belonging



3 month

It's just lots of side comments being thrown. [co-worker] was making a joke about how if you drink too much beer, you'll become unintelligible like a woman. Our engineers will only tend to address my co-worker and not me, so if I want to be a part of a conversation, I must actively place myself in a spot where I can engage, and it's been hard. Today, there's three of them and me, just like the way they position themselves didn't allow me to enter their little circle so that I could hear.



6 month

In the beginning [3 months], it would have been getting to know my coworkers, having a good relationship with them, being able to absorb everything. Then, as we advanced [6 months], it was staying away from particular people, just because, this is kind of interesting, we have a [coworker] who's very condescending almost dismissive of women. So, there was that also that I had to work with.



12 month

I heard [coworker] say like oh, she's always smiling. It's so nice to see, just stuff like that, and I don't know. It was just like very subtly sexist. I don't really know where I thought I would be a year from when I started. Just because I think I am so overwhelmed with the amount of learning that I had to do. I guess I wanted to be in a place where I would be really comfortable, but I mean... I don't know.

from: T. Chowdhury, C.M. Pee, S. Bhaduri, R. Dix, Do We Even Belong? Results from Tracing Experiences of Women who are New Graduates to Inform Practitioners at Organizations, 37th Annual Society of IO Psychology Conference (SIOP), 2022



tchowdhury, Lewis



cmp1@siop.org

He would talk over me a lot.  
He would just keep interrupting  
me.



**Teamwork & Communication**

People who see me say, "Oh,  
you look like you're 12," pat  
on the head, cute little  
engineer, and get dismissed.



**Identity Development**

I don't intend to stay in this  
industry - it seems kind of  
problematic and there are too  
many egos!



**Lifelong Learning**

from: T. Chowdhury, C.M. Pee, S. Bhabari, B. Oll, Do We Even Belong? Results from Tracing Experiences of Women who are New Graduates to Inform Practitioners at Organizations, 37th Annual Society of IO Psychology Conference (SIOP),



*Richards, Lewis*



*Chowdhury, T*





# COACH



## COACH: TRAVELING FASHION

Estimated maximum load: 1500 lbs. (700 kg)  
"COACH" designed to hold 10 lbs. (4.5 kg)  
weight of the fashion items.

Height: 3000 mm (100 in.)  
Weight: 1000 kg (2200 lbs.)  
Estimated weight of 1 hour coach: 1000 kg

© 2019 Coach Inc.



3

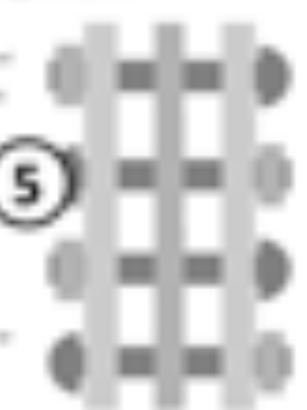
3. The beam is fixed to the top. The only a  
big company. Coach has decided to  
the top that same and create comfortable  
an alternative solution for the traveling  
business professional. The solution is  
designed with the goal of being  
professional with hands and wrists  
the comfort Coach chose the aluminum  
beam structure which allows for the  
flexible and extremely versatile and  
stable. The beam is designed to  
offer a great solution.  
The beam is fixed to a bearing plate  
which connects the ball joint. The  
is Coach, connecting the beam and  
mounting plate. The bearing plate can  
be used to hold the beam together.  
While there is a ball joint on the  
axis for rotational pivoting, the  
beam is supported by the ball joint  
axis. The axis of rotation is  
perpendicular to the axis of the  
beam.

Ball Joint  
Ball Joint  
Ball Joint

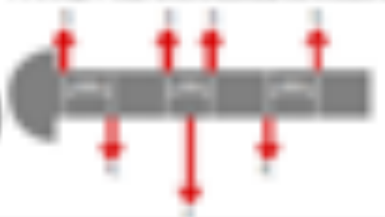
### ASSUMPTIONS

1. The beam is fixed to the top. The only a  
big company. Coach has decided to  
the top that same and create comfortable  
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offer a great solution.

$$F = \frac{W}{A}$$
$$F = \frac{W}{A}$$
$$F = \frac{W}{A}$$
$$F = \frac{W}{A}$$
$$F = \frac{W}{A}$$



2



Beam is fixed to the top  
Ball joint is used to  
connect the beam to the  
top of the structure.

Student groups in a Solid Mechanics class, consisting of 4-5 students, were tasked with conducting a photo shoot in which each group was required to identify, photograph, and calculate internal normal and shear stresses for a structure that is loaded in compression, tension, direct shear, torsion or twisting, and behaves as a beam. To accompany their photos, students were also required to write a paragraph describing the rationale for choosing the structure as well as its material, dimensions, and location.



Michelle Lewis


Michelle Lewis



*A stigma that has been long held in the scientific world shall stand no longer.*

***Math can be pretty and displayed with an aesthetic outside of times new roman (it's fine but it's boring). This creates a stuffy barrier between the world of art and the world of STEM. The mission of ENGR magazine is that by breaking down these walls, science can have a new place in our world. Women and girls can see that being in science does not limit femininity and that - femininity does not limit science. It never has.***

*-students in a Solid Mechanics class*



From: C. Edwards, C. McCall, B. Dukan, & S. Bhaduri, *Coloring Outside the Lines: Exploring the Potential for Integrating Creative Assessment in Engineering Education*, ASSE 2023 (upcoming)



c.edwards\_lewis



s.bhaduri@uiowa.edu





**WHAT IS JEDI?**



**WHY IS IT  
IMPORTANT?**



**HOW CAN YOU  
INCORPORATE IT?**



@Richard\_Lewis



@KathrynLof



**Introduce yourself inclusively**

**Build rapport in group and individual settings**

**Create opportunities for anonymous, constructive contributions and feedback**



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**Inquire about folks' opinions in individual discussions**

**Allow people to express themselves in various ways**

**Intentionally prompt people to consider viewpoints different from their own**



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SEEK THE  
DISCOMFORT OF



**Call out biases when you witness them and address them when you have the power to make a change**

**Advocate for marginalized voices in public AND private spaces**

**Use your power for good not for an ego trip**

**Lifelong learning extends beyond ABET's technical requirements.  
Partner with engineering educators and continue to learn and grow as society changes**

**Give genuine consideration to JEDI when drafting broader impacts and seeking collaborators**



**What steps will you take  
based on what you learned  
today?**



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## A quick recap...

- Defined what JEDI means
- Understand why JEDI is important
- Strategize how to incorporate JEDI



# INTERESTED IN LEARNING MORE?



**Dr. Racheida Lewis**

she/her  
eRacheida\_Lewis



**Dr. Sreyoshi Bhaduri**

she/her  
eThatStatsGirl



**Leo Lewis (he/him)**

**THANK YOU!**