



Ismi  
n Lourentzou

Assistant Professor

Computer Science, Virginia Tech

<https://isminoula.github.io>

[twitter.com/ismini\\_L](https://twitter.com/ismini_L)



SANGHANI CENTER FOR  
ARTIFICIAL INTELLIGENCE &  
DATA ANALYTICS  
VIRGINIA TECH.



COLLEGE OF ENGINEERING  
**COMPUTER SCIENCE**  
VIRGINIA TECH.

COLLEGE OF AGRICULTURE AND LIFE SCIENCES  
CENTER FOR ADVANCED  
INNOVATION IN AGRICULTURE  
VIRGINIA TECH.



DeepMind

@DeepMind



Introducing Ithaca, the first deep neural network for textual restoration, as well as geographical and chronological attribution of ancient Greek inscriptions.

Out today in [@nature](#), Ithaca aims to assist historians & better understand ancient history: [dpmd.ai/ithaca-blog](https://dpmd.ai/ithaca-blog) 1/



4:24 PM · Mar 9, 2022



[Read the full conversation on Twitter](#)



1.2K



# My career path

# Bachelors in Business Administration



# NATIONAL BANK OF GREECE



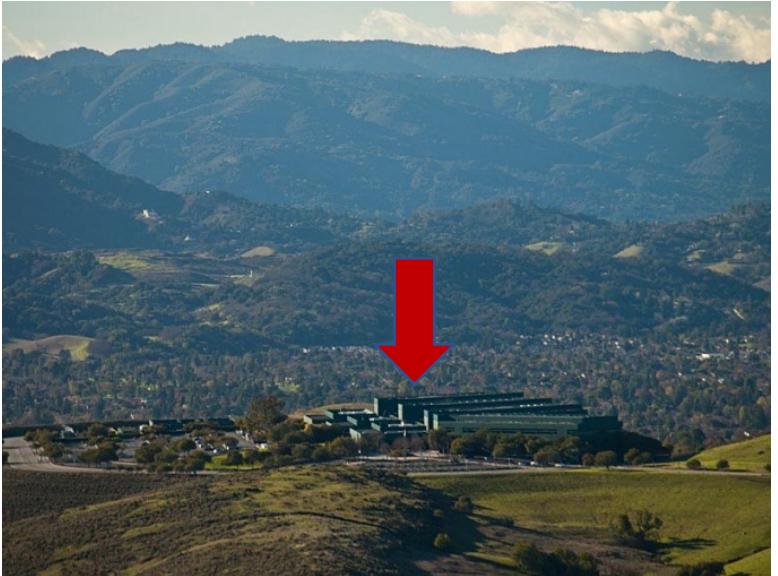
# Bachelors in Computer Science

Ph.D. in Computer Science



# Summer Internships

# My career path



IBM Research Almaden, San Jose CA



# Research Focus



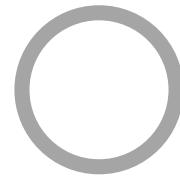
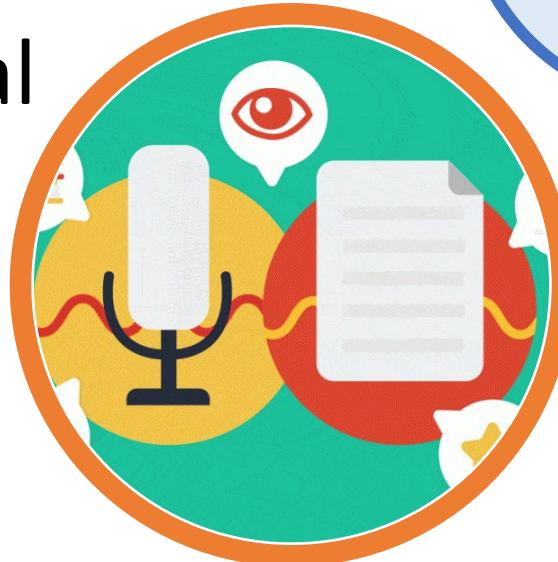
How can we build intelligent systems that  
**perceive the world** similar to as humans do?



How can we utilize these intelligent systems to  
assist us and to **augment human intelligence**?

# Research Directions

Multimodal  
Learning



*(Multi-agent)*

Reinforcement  
Learning



Data Quality in ML



# Multimodal Machine Learning (Vision + Language)

- Video Language Grounding
- Video Generation
- ...

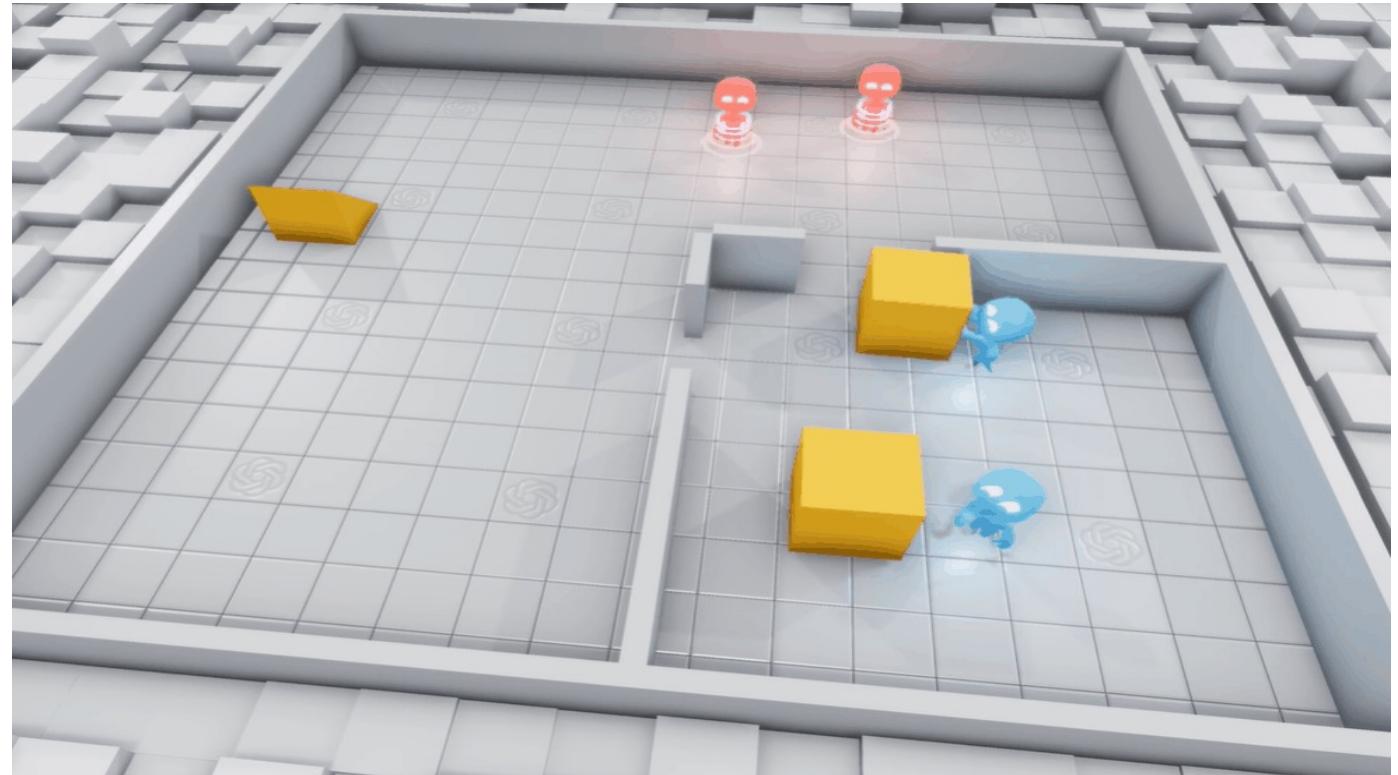


Source: EPIC KITCHENS Dataset  
<https://epic-kitchens.github.io/2021>

Damen, Dima, Hazel Doughty, Giovanni Maria Farinella, Sanja Fidler, Antonino Furnari, Evangelos Kazakos, Davide Moltisanti et al.  
"Scaling egocentric vision: The epic-kitchens dataset." In *Proceedings of the European Conference on Computer Vision (ECCV) 2018.*

# (Multi-agent) Reinforcement Learning

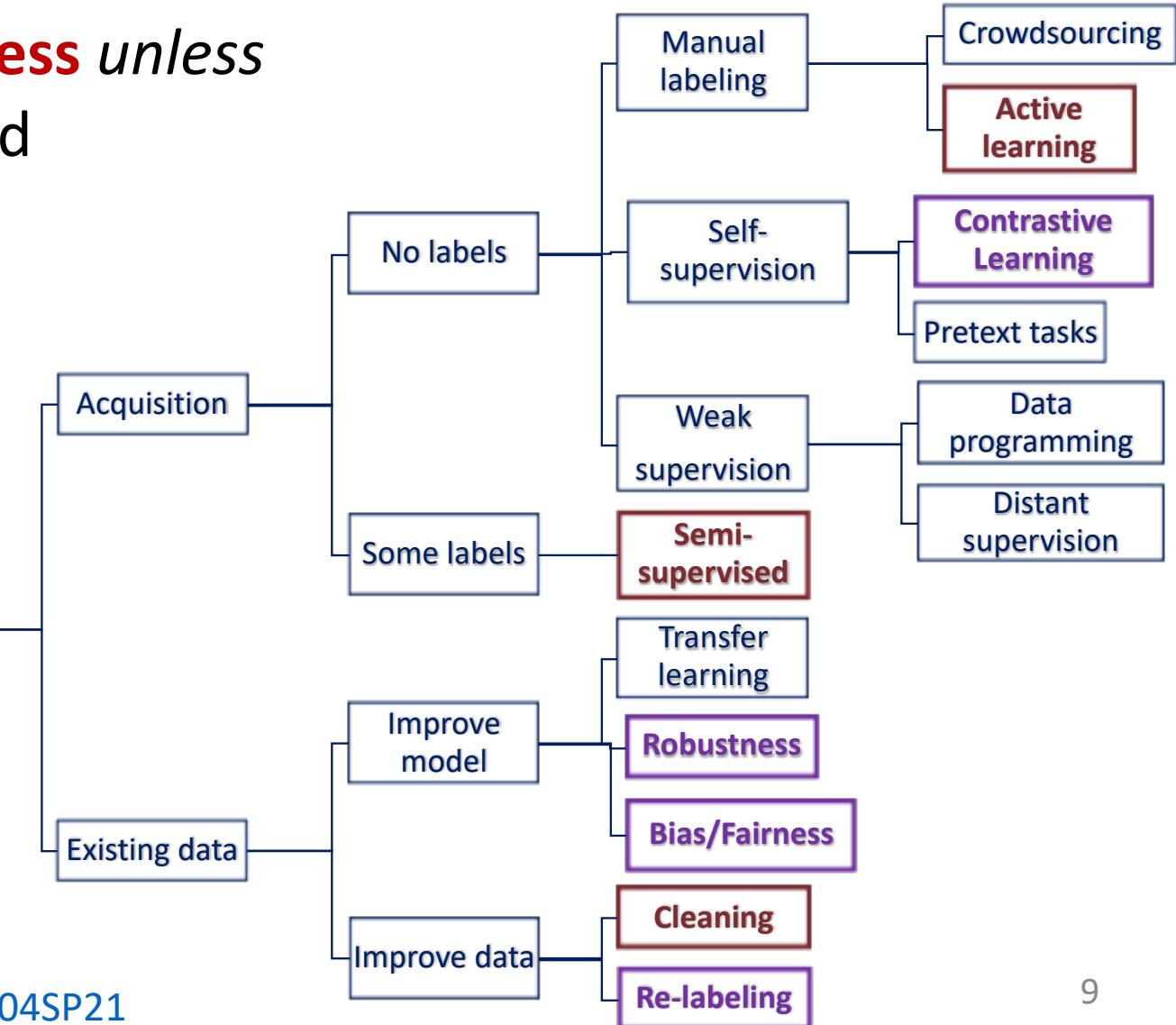
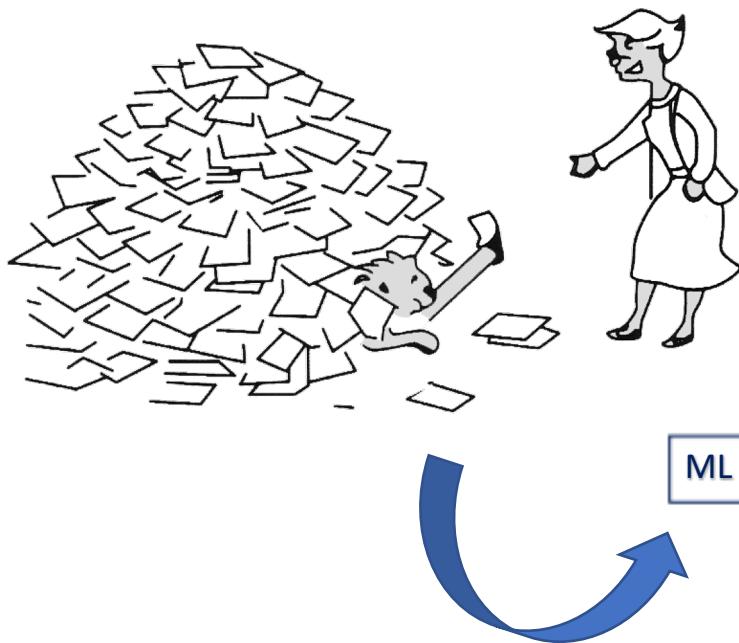
- Emergent Behavior & Communication
- Coordination
- Embodied AI
- Healthcare Applications
- ...



Source: <https://openai.com/blog/emergent-tool-use/>

# Data Quality in ML

Information **hidden in data** is **useless unless**  
it can be **discovered** and consumed

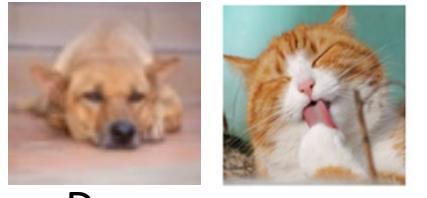


# Machine Learning

## Zero-shot Learning



Dog



Dog



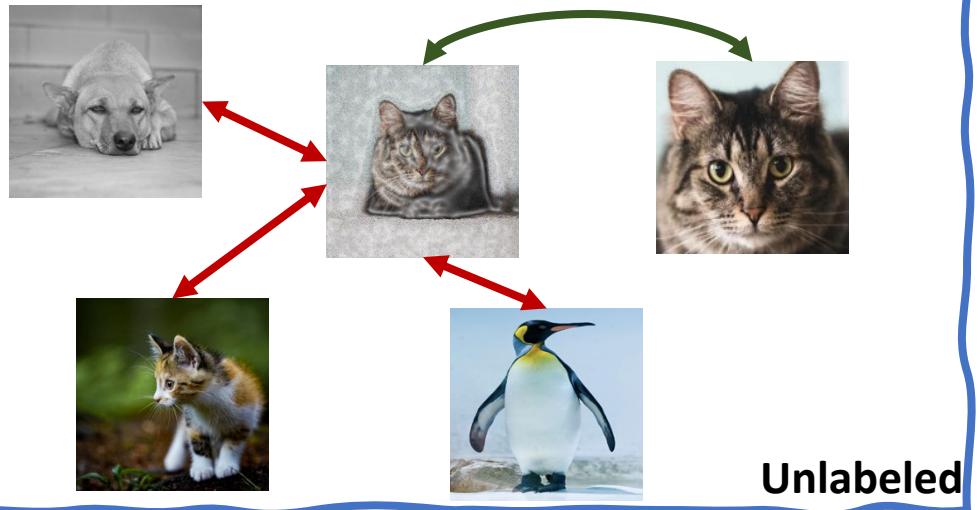
Dog



Train

Test

Self-supervision

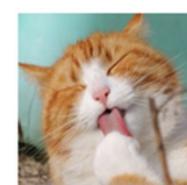


Unlabeled

## Open-Set Semi-supervised Learning



Dog



Cat



Cat



Cat



Dog



Cat



Unlabeled (Possibly OoD)



Train

# ML4Healthcare

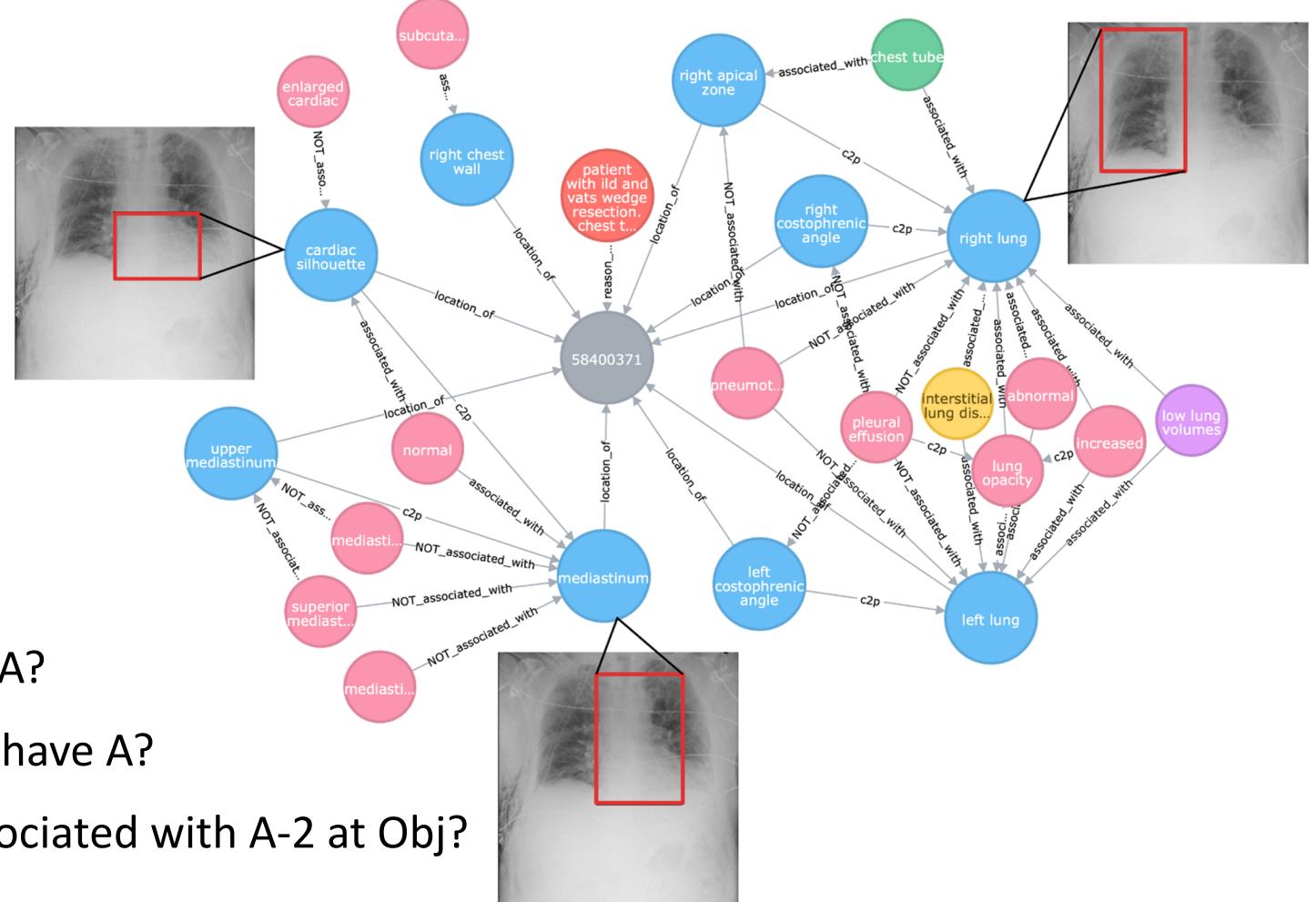
## Chest Imagenome

Longitudinal Scene Graph Dataset  
that simplifies anatomically aware  
clinical reasoning:

- **242,072** graphs
- 29 object types
- 76 attribute types
- 4.9M relations

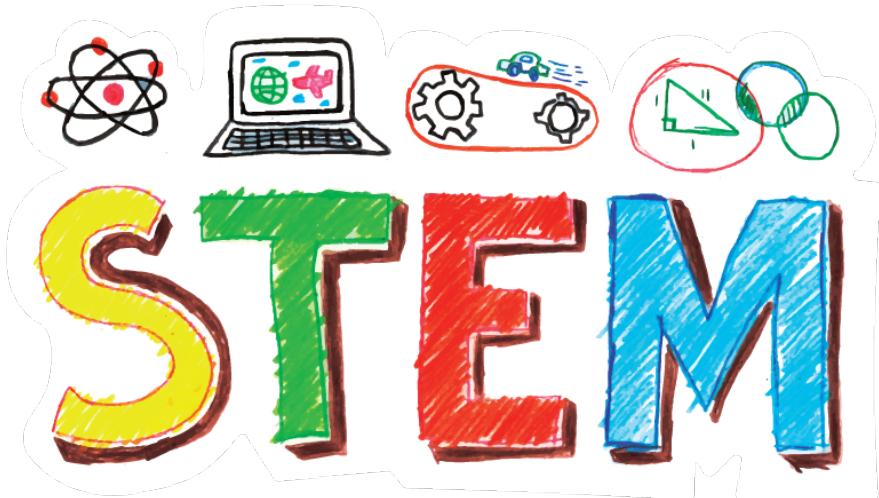
### Clinical Q's:

- ↳ Where is A?
- ↳ Does Obj have A?
- ↳ Is A-1 associated with A-2 at Obj?



# The beauty of STEM research

Rewarding  
Creative  
**Working with collaborators all over the world**  
Impact and value to society  
**New things to do every day (never get bored)**

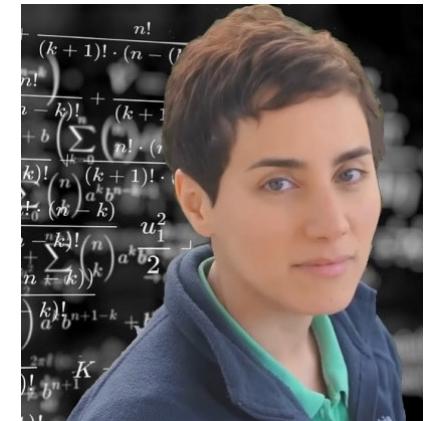


Mae Carol Jemison, NASA astronaut and engineer.  
First black woman to travel into space



Grace Hopper, computer scientist.  
Invented the first compiler.

Maryam Mirzakhani, mathematician.  
Fields Medal for her work on  
geometry of Riemann surfaces.



# The beauty of Women in STEM

Inventors

Teachers

Pioneers

Leaders

*"Outstanding women can function as inspirational examples of success, illustrating the kinds of achievements that are possible for women around them. They demonstrate that it is possible to overcome traditional gender barriers, indicating to other women that high levels of success are indeed attainable."*

-Penelope Lockwood, Psychologist

# Challenges for Women in STEM

<https://ncses.nsf.gov/pubs/nsf21321/report/field-of-degree-women>



## Women, Minorities, and Persons with Disabilities in Science and Engineering

Report Data Tables Technical Notes Additional Resources Downloads Contact Us How Do I?



### Report

About this report

Executive summary

Introduction

Enrollment

Field of degree: Women

Overview

Social sciences

Computer sciences

Engineering

Mathematics and statistics

Earth and physical sciences

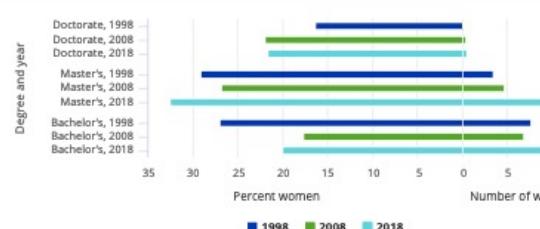
Field of degree: Minorities

Field of degree: Intersectionality

### Computer sciences

Computer sciences has one of the lowest shares of female degree recipients among the broad fields of S&E, despite an increase in the number of women receiving computer sciences degrees over the past 2 decades—the number of women with bachelor's and doctoral degrees more than doubled, and the number with master's degrees more than quadrupled. Although the share of women receiving master's and doctoral degrees increased, the share receiving bachelor's degrees declined, from 27.0% in 1998 to 19.9% in 2018. The academic pipeline for women earning advanced degrees in computer sciences may be affected, to the extent that graduate enrollment will be affected by a smaller proportion of women receiving a bachelor's in computer sciences (figure 10).

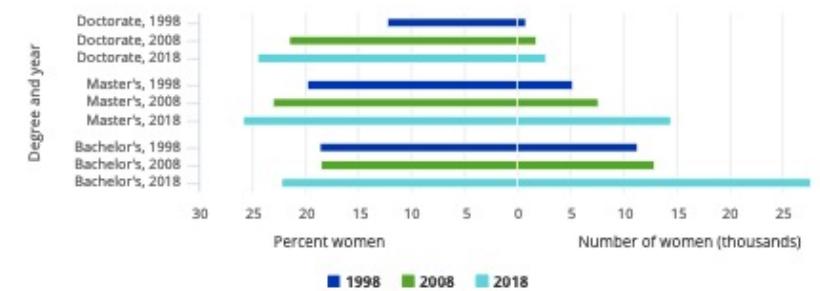
Figure 10  
Degrees awarded to women: Computer sciences, 1998, 2008, 2018



### Engineering

Engineering is another S&E field with one of the lowest shares of female degree recipients. However, both the number and share of women receiving engineering degrees increased at all levels over the past 2 decades. The number of women receiving engineering doctoral degrees is small, about 2,700 in 2018, yet the share of degrees earned by women in this field doubled, from 12.3% to 24.5% since 1998 (figure 11).

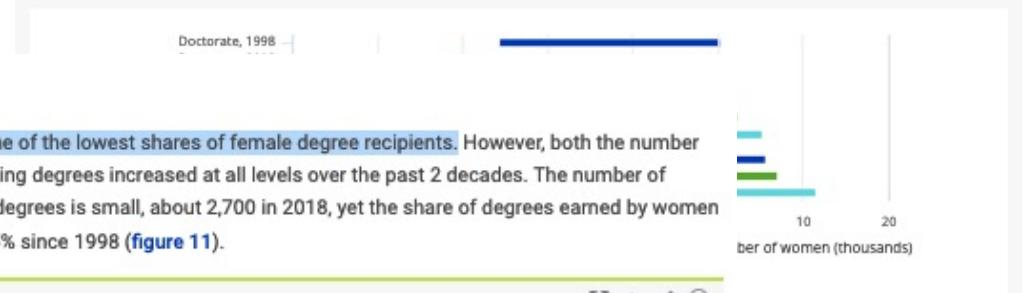
Figure 11  
Degrees awarded to women: Engineering, 1998, 2008, 2018



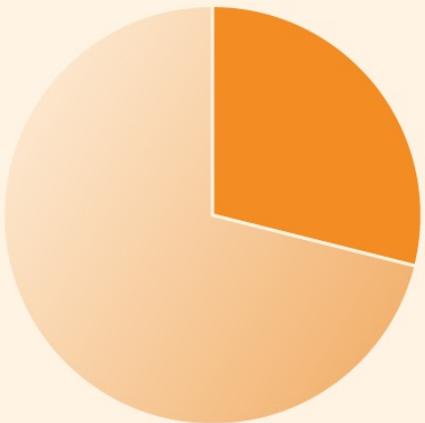
### Mathematics and statistics

Women earned less than half of mathematics and statistics degrees: their share was over 40% at both the bachelor's and master's levels but under 30% at the doctoral level. Over the past 2 decades, the share of women receiving bachelor's degrees in mathematics and statistics declined and the share of women receiving master's degrees was stagnant. At the doctoral level, women's share increased between 1998 and 2008, from 25.7% to 31.1%. The share then declined to 28.0% in 2018, even though there was an increase in the number of women receiving doctoral degrees (figure 12).

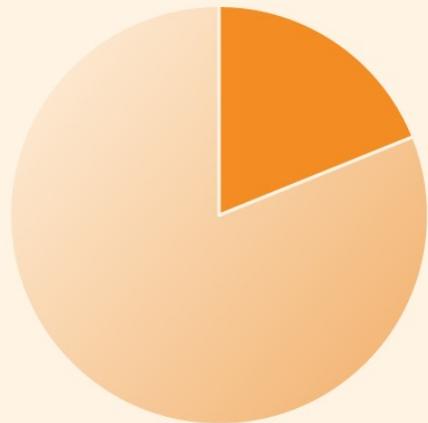
Figure 12  
Degrees awarded to women: Mathematics and statistics, 1998, 2008, 2018



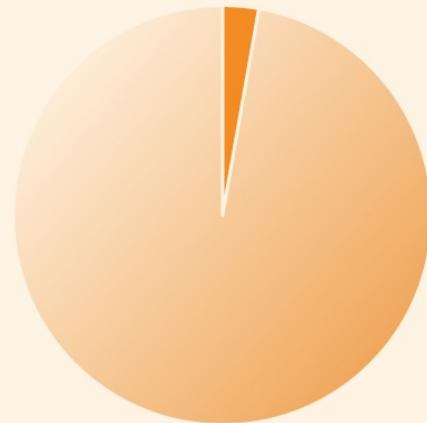
# Challenges for Women in STEM



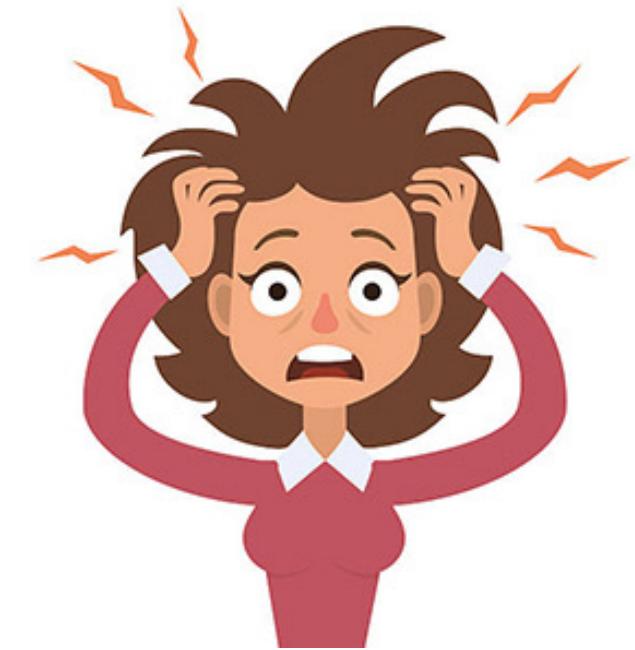
Women make up  
**29%** of the STEM  
labor force.



**19%** of STEM  
company board  
members are women.



Among STEM  
industry CEOs,  
**3%** are women.



Source: <https://www.bigrentz.com/blog/women-in-stem-statistics>

# The reality

- ⌚ Stereotypes / Assumptions
- ⌚ Lack of Confidence
- ⌚ Lack of mentorship
- ⌚ Competition
- ⌚ Many more!



#InclusionStartsWithI  
Accenture Inclusion & The Power of Diversity | Accenture



#InclusionStartsWithI  
Accenture Inclusion & The Power of Diversity | Accenture

**So, what can we do as women in STEM?  
I will share what has helped me**

Source: <https://www.youtube.com/watch?v=2g88Ju6nkcg>

# Realizing

- Almost all fields are competitive
- Time is finite (within and outside work/career)

Step #1:

Align your research **interests** with your **strengths**.

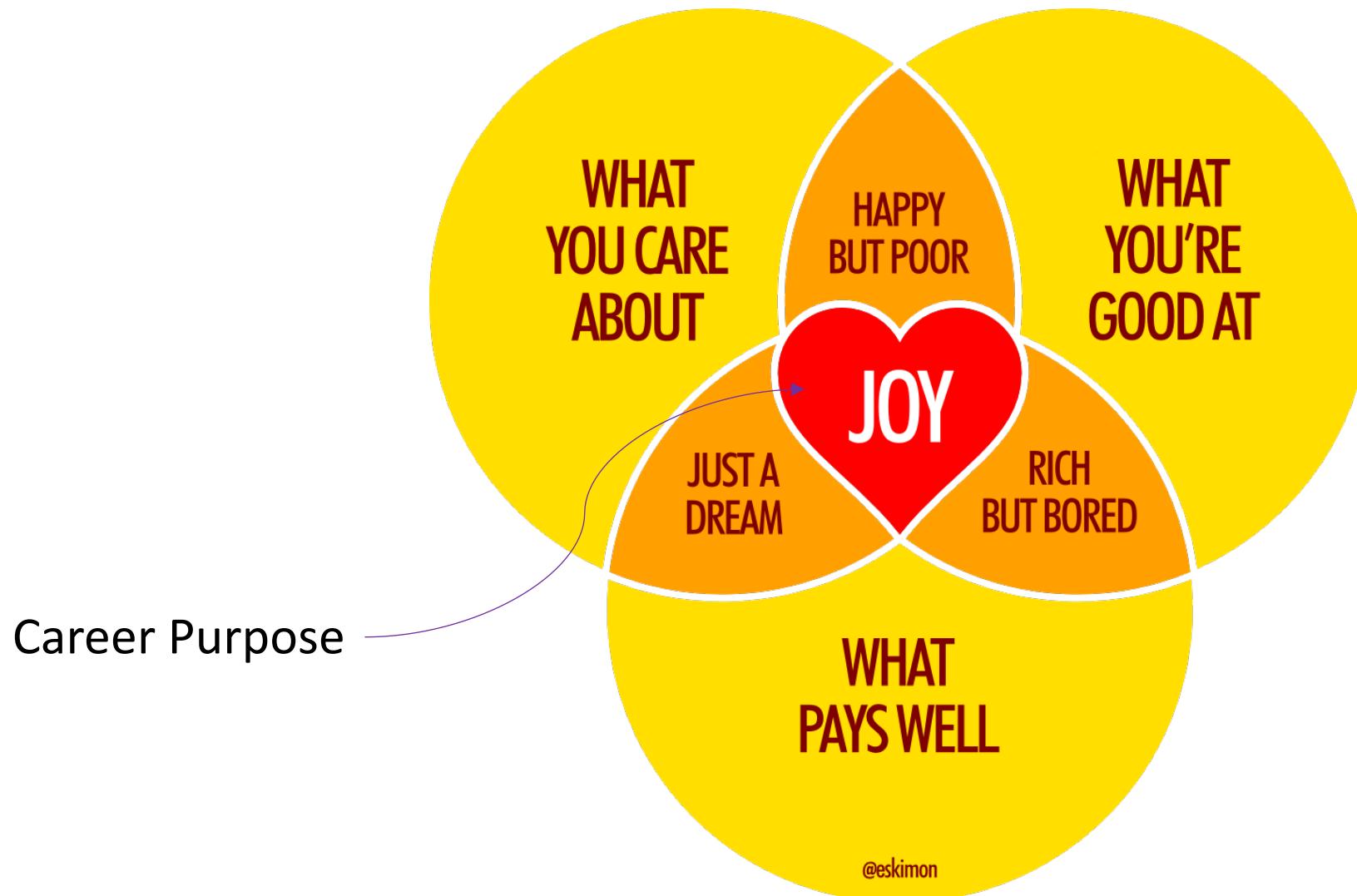
You will be more **creative** and would want to execute and bring your ideas to life.

Optimize both **success** and **happiness!**



<https://i.pinimg.com/736x/26/69/41/266941c6285e0a6f99d2efdeaa3f6b25.jpg>

# The ideal place to be

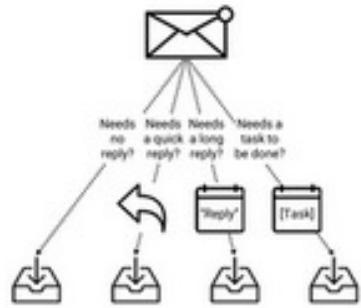


# Learn generally useful skills

Get your technical and time management skills together

<https://missing.csail.mit.edu/>

Read and adopt tips and advice (the ones that work for you) about speeding up processes (code, writing, plots, time blocking, calendar)



## Checking Email → Inbox Zero

A methodology for checking email that leads to inbox zero.

Devi Parikh Jul 3, 2018



## Calendar. Not to-do lists.

Viewing time as space.

Devi Parikh Apr 25, 2018

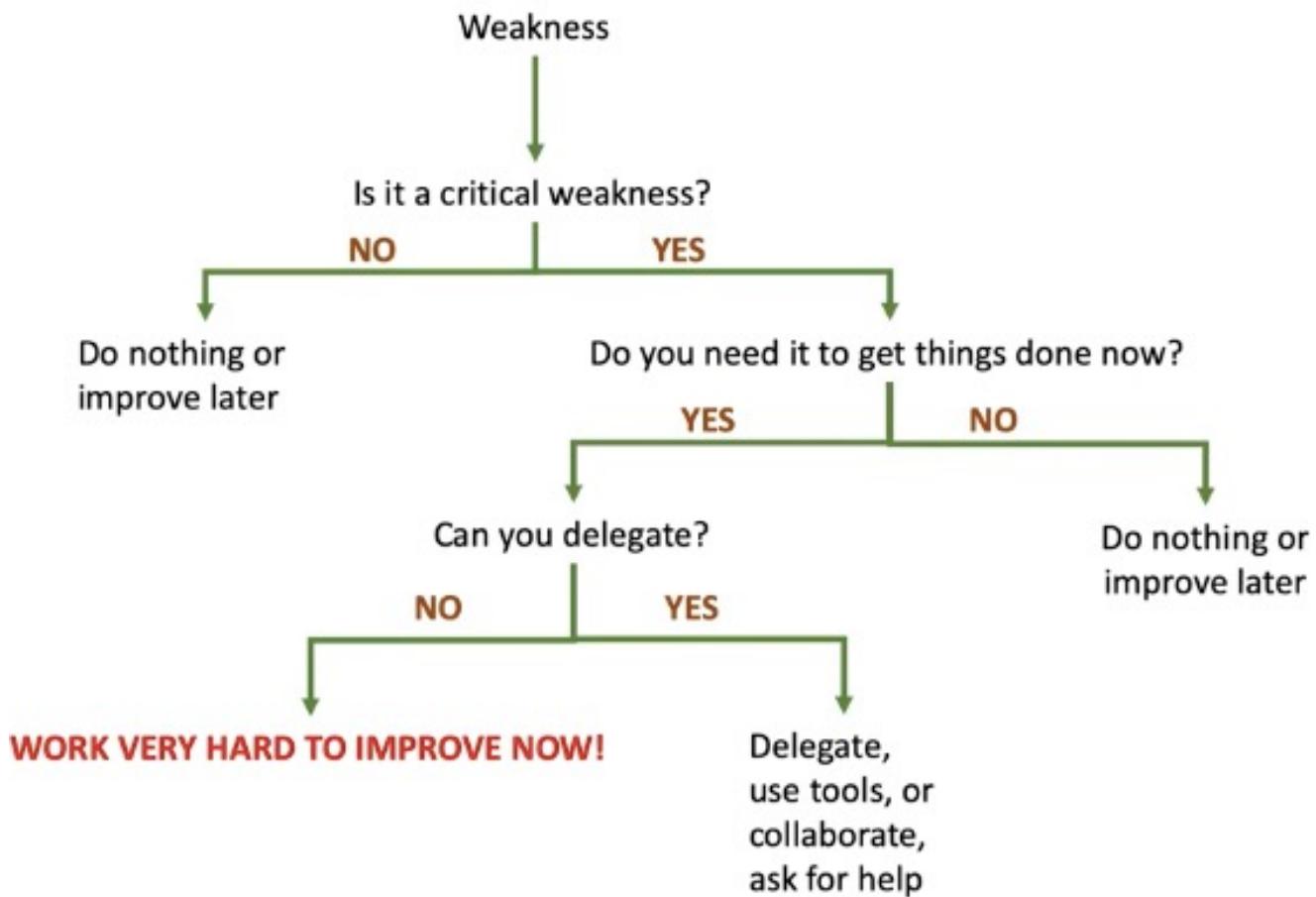


## Intrinsic motivation, sparks of joy, and time management

How I sustain and approach work-life balance

Devi Parikh

# Work on (some) weaknesses



Fascinated by math  
Never had the time to properly learn and advance 😞

Can't do theory work obviously, but I can collaborate with theoreticians 😊

Will work on it as a hobby but mostly delegate



Source: Randy Pausch's Time Management Strategy  
By Prof. [Daphne Yao](#) (Virginia Tech)  
<https://www.youtube.com/watch?v=wTwElng0iqQ>

# And then ...

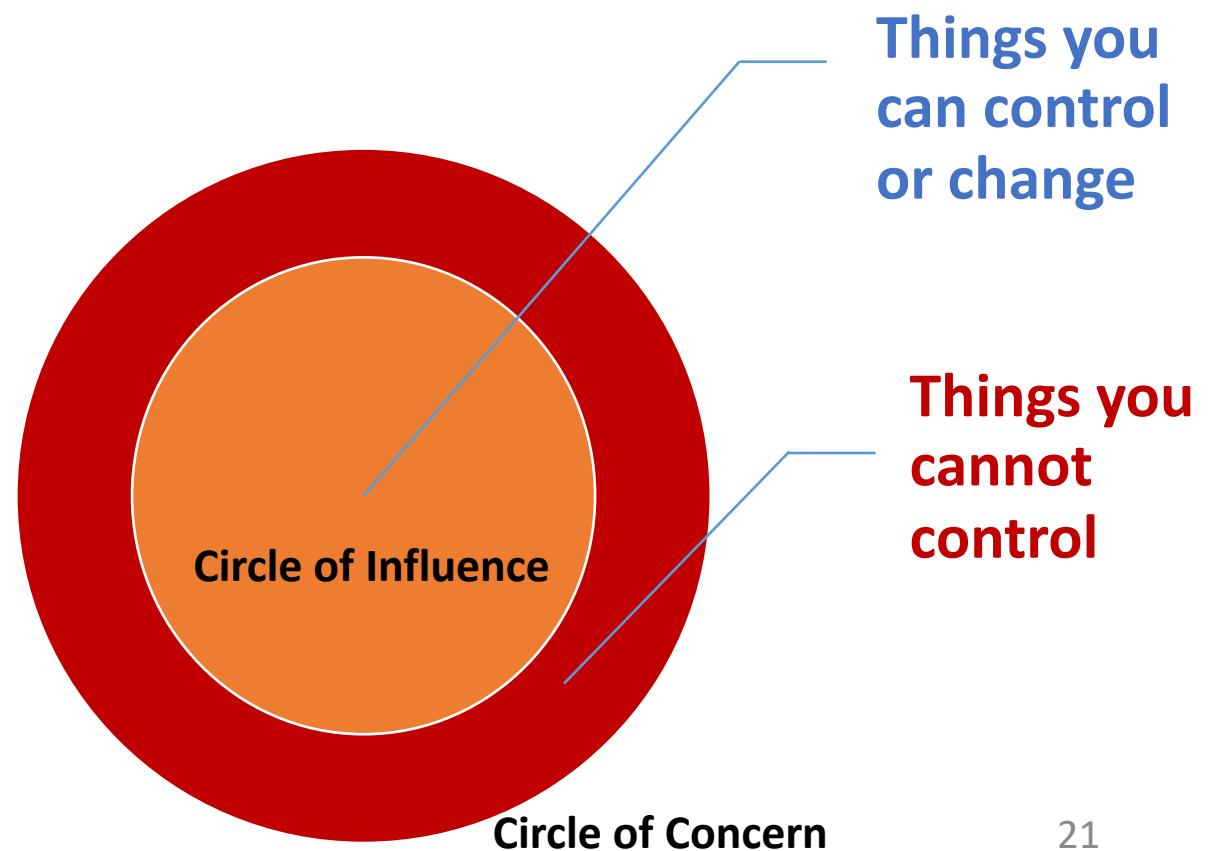
## Work hard and be proactive

Seize the opportunities (to present, to network, get out of your comfort zone)

Re-evaluate your commitments and plans when needed

Remember **why** you like what you do

**Trust yourself**



# Helps you focus on the good things

## Proactive

- Prepare before things happen
- Ready to face challenges with a calm attitude
- Choose how to respond on things that happen
- Understand that some things will not go your way and that is OK



## Reactive

- Deal with items when they happen instead of being prepared
- Anxious and stressed when things do not go your way

Reactive Language	Proactive Language
There's nothing I can do	Let's look at our alternatives
That's just the way I am	I can choose a different approach
That makes me so mad	I have control over my own feelings
I have to do that	I will choose an appropriate response

Source: <https://www.calmsage.com/wp-content/uploads/2021/04/reactive-vs-proactive-thinking.png>

# Be more than that ...

Persistent

Resilient

Brave

Curious, ask questions, ask for feedback

**Never give up!**

**NO ONE** can do exactly what you can do

Everyone is different

You are **unique** and **indispensable**



Source: [https://m.facebook.com/therabox/photos/a.1817870881796618/2819336478316715/?type=3&\\_rdr](https://m.facebook.com/therabox/photos/a.1817870881796618/2819336478316715/?type=3&_rdr)

# And then ...

## Promote yourself

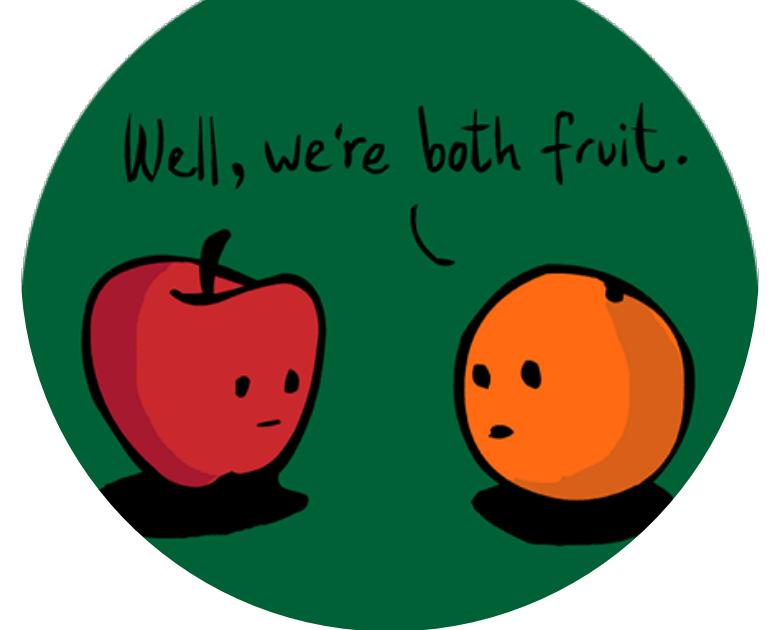
No-one else will do this better than you for you

Be your own cheerleader and celebrate your accomplishments instead of downplaying them.



Source: [https://transcendculture.co/wp-content/uploads/2012/12/825880\\_thumnbail1-1024x790-600x463.jpg](https://transcendculture.co/wp-content/uploads/2012/12/825880_thumnbail1-1024x790-600x463.jpg)

# Comparing is meaningless



## Compare only with yourself

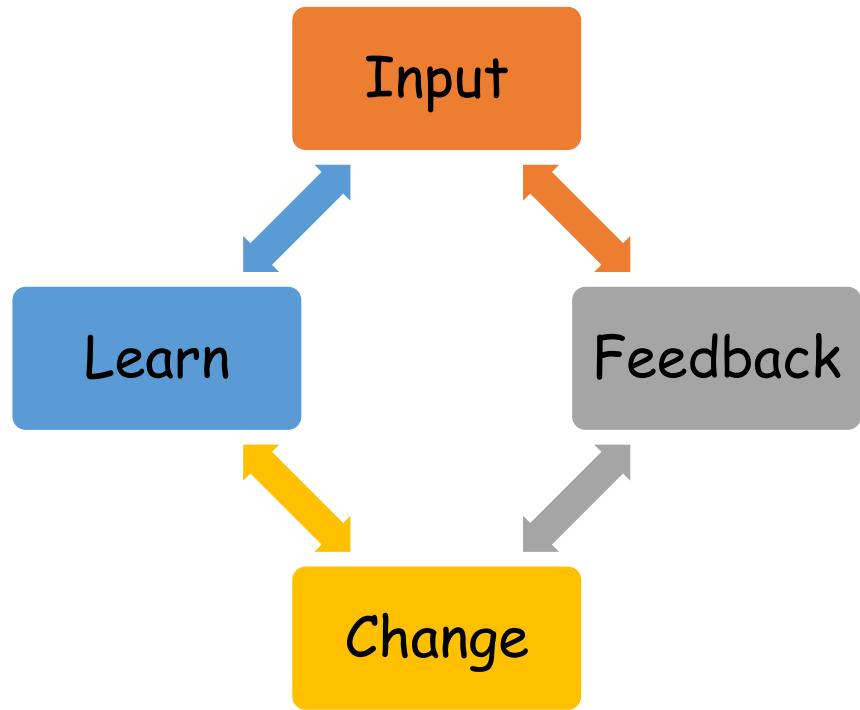
No need to worry about metrics such as  
number of publications, citations, likes, posts, funds, rankings, tenure, promotion, etc.

## Focus on your [research] path.

If you love what you do these will eventually come ...

And if not, **you still will have spent your time doing what you love!**

# Copying with ...



Failure, criticism and rejection

May happen (quite frequently)

*Graduate admissions, tests, exams, papers, jobs, promotions, ...*

Review, learn and improve

Take constructive feedback

but also, **respectfully** defend your work

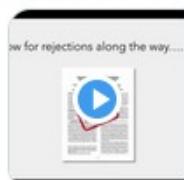


Aditya Parameswaran  
@adityagp

...

Coping with Rejection in Academia: A Three-Pronged Approach.

Μετάφραση Tweet



loom.com  
Coping with Rejection

Source:

<https://twitter.com/adityagp/status/1300468018086989825>

Worth to watch!

# Find mentors

- ✓ They will be your support system and help you thrive
- ✓ Not necessarily female
- ✓ Not necessarily an academic
- ✓ Better to have diverse set of mentors → “multi-view learning”
- ✓ The mentor list is not static, changes through time



Prof. Filia Makedon, UTA



Prof. Stavros Toumpis  
AUEB



Prof. Michalis Vazirgiannis,  
Ecole Polytechnique



Prof. Chengxiang Zhai,  
UIUC



Daniel Gruhl, IBM  
Research



Alfredo Alba,  
IBM Research



Steven Welch,  
IBM Research

+ Prof. Kalamboukis, AUEB (no pic)

Thankful for the advice and mentorship I have received

# Give back to your community → Collective effort

- Share your experiences with your peers
- Mentor students
- Find courage, stand up for others
- Support diversity
- Empower and encourage others around you
- Confront your own biases and assumptions



# Besides, all these challenges are gifts

CHALLENGES ARE GIFTS THAT FORCE US TO  
SEARCH FOR A NEW CENTER OF GRAVITY.  
DON'T FIGHT THEM. JUST FIND A  
DIFFERENT WAY TO STAND.

- OPRAH WINFREY -

Do not underestimate the power of \_\_\_\_\_ students.

First Generation

Mothers with dependent children

African American

Hispanic

Native American

...

# Document your experiences

Parents of first-generation college students often lack awareness of the social and economic benefits of college attendance and are less likely to attend information sessions about college, seek out financial aid information, or go on college visits. If I wanted to attend college, I had to educate myself about schools, majors, financial aid, and scholarships.

...

First-generation college students are much more likely to enroll in less selective two-year and four-year institutions due to concerns about college costs, financial aid, and being able to work while attending school.

...

First-generation college students have less confidence in their abilities to succeed.

My time as a waitress felt like no match to other students' internships at the World Bank, JP Morgan, and the United Nations. Instead of doing unpaid internships on Capitol Hill, I worked a minimum wage job and served as a resident assistant to help cover the enormity of expenses that came with attending such a prestigious university.

...

I entered college with the utmost determination to graduate, and I left college with a degree that represents personal transformation, resilience, and promise. My education enlightened me to systemic injustice that prevents many first-generation students, students from low-income families, and students of color from graduating.

# Have Fun!



Time remains finite even after this talk

# Other Resources

## AI research:

The unreasonably narrow path  
and how not to be miserable

Google Tech Talk  
21 Oct 2020

Rosanne Liu  
<http://rosanneliu.com>

[https://www.youtube.com/watch?v=0bIQp0\\_9NwY](https://www.youtube.com/watch?v=0bIQp0_9NwY)

If only one talk/video, watch this one!



## Humans of AI: Stories, Not Stats

by Devi Parikh and Dhruv Batra

In this interview series, [Devi Parikh](#) and [Dhruv Batra](#) talk to AI researchers to try and understand who they are as people, what their life is like, what they think about, what they are insecure about, and what they get excited about – questions that reveal the stories of their day-to-day life.

<https://www.humanstories.ai/>



## INDIVIDUALIZED CYBERSECURITY RESEARCH MENTORING (IMENTOR) WORKSHOP 2021

<https://sites.google.com/vt.edu/imentor/program>

## IMMIGRANT COMPUTER SCIENTISTS PODCAST

An Oral History Project featuring Prominent Computer Scientists

<http://csimmigrant.org/>

## New In ML workshop at NeurIPS 2021

A workshop to help young researchers do solid work and publish high-quality papers.

[https://sunhaozhe.github.io/NewInML2021\\_NeurIPS/](https://sunhaozhe.github.io/NewInML2021_NeurIPS/)

# Other Resources



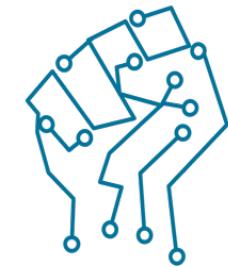
LatinX in AI

<https://www.latinxinai.org/>



**EECS RISING STARS 2021**

<https://risingstars21-eecs.mit.edu/>



Black in AI

<https://blackinai.github.io>



**CRA**

Computing Research  
Association

<https://cra.org/for-students/>

**{DIS}ABILITY IN AI**

[https://elesa.github.io/ability\\_in\\_AI/](https://elesa.github.io/ability_in_AI/)