



EMORY  
UNIVERSITY

# BP(HP)C: Broadening Participation in (High-Performance) Computing

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i am hpc.

**SC23**

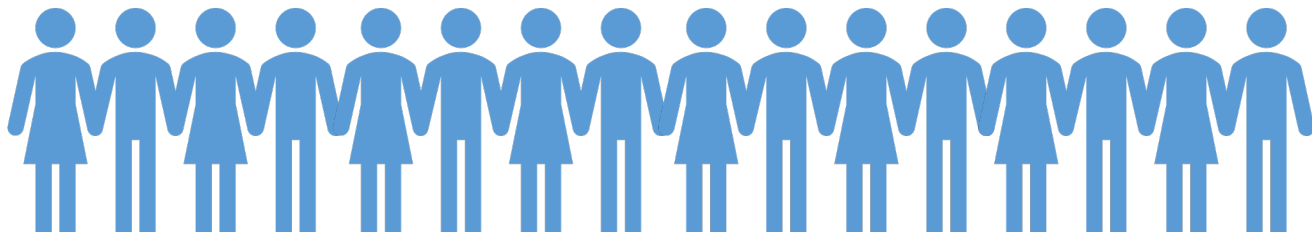


Applications

Libraries, Algorithms, Tools

System Software

Hardware



It's people  
all the  
way down!



# Indeed, we're at a crossroad!

There's not enough people ... in HPC!

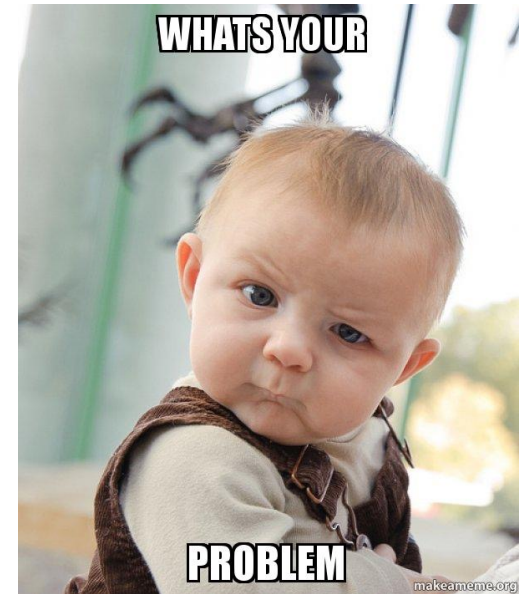
- What is the size of the worldwide HPC workforce?

“according to the International Data Corporation (IDC) ...

the global HPC workforce was estimated at ~200,000 in 2020”

- What is the workforce demand gap?    Let's go with 25%!

50,000 more people? Just 1 out of every 1M people you meet!



OpenAI  
ChatGPT.

What if 0.004% HPC uptake  
is as good as it gets?



# Possible Solutions

Increase birth rate?

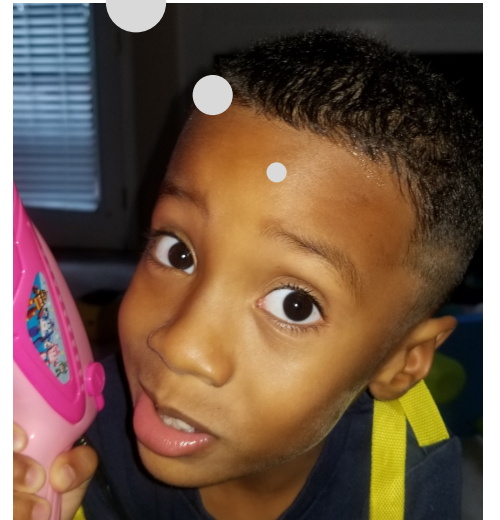
Decrease death rate?

Increase retirement age?

Loosen child labor laws?

Artificial Intelligence?

What the ...



# What if we Increase Participation?!



# U.S. CS Degree Production (2017-2021)

Race/Ethnicity	Bachelor's		Master's		Combined		U.S
White	46,280	48.9%	7,834	18.6%	54,114	39.6%	75.8%
Nonresident alien	10,100	10.7%	27,164	64.6%	37,264	27.2%	
Asian	14,464	15.3%	3,470	8.3%	17,934	13.1%	6.1%
Hispanic or Latino	10,163	10.7%	1,135	2.7%	11,298	8.3%	18.9%
Black or African American	6,679	7.1%	1,115	2.7%	7,794	5.7%	13.6%
Unknown	3,439	3.6%	839	2.0%	4,278	3.1%	
Two or more races	3,245	3.4%	455	1.1%	3,700	2.7%	3.0%
American Indian/Alaska Native	199	0.2%	28	0.1%	227	0.2%	1.3%
Native Hawaiian/Pacific Islander	146	0.2%	19	0.1%	165	0.1%	0.3%
<b>Gender</b>							
women	18,554	20%	12,392	29%	30,946	23%	51%
men	76,161	80%	29,667	71%	105,828	77%	50%
<b>Total</b>	94,715	100%	42,059	100%	136,774	100%	100%





## BROADENING PARTICIPATION IN COMPUTING

DIRECTORATE FOR COMPUTER INFORMATION  
SCIENCE & ENGINEERING

“... meaningful actions that that address the longstanding underrepresentation of various populations -- including **women, African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians, Native Pacific Islanders**, and **persons with disabilities** -- in computing and closely-related disciplines”

- <https://www.nsf.gov/cise/bpc>

### Guiding principles:

- BPC requires **culture change**
- Culture change begins with enhanced **exposure to BPC**
- Engagement must be **tailored to individuals and organizations**

HPC Workforce grows by ~20%  
if you correct representation!

But wait ... there's more!

Diverse groups perform better!



Hong and Page, "Groups of Diverse Problem Solvers Can Outperform Groups of High-Ability Problem Solvers."  
*National Academy of Sciences*, 101(46), 2004

But wait ... there's even more!

BPC practices improve cultures  
and increase participation  
of non-target groups!

# Call to Action!

- **Train, recruit, retain!**
- Develop a **broadening participation plan** ... and then use it!
  - [bpcnet.org](http://bpcnet.org)
- Always **connect** your science and engineering **to people**
  - Once inspired by the what, we become inspired for the how
- Become more **people and service oriented!**

There's no more!