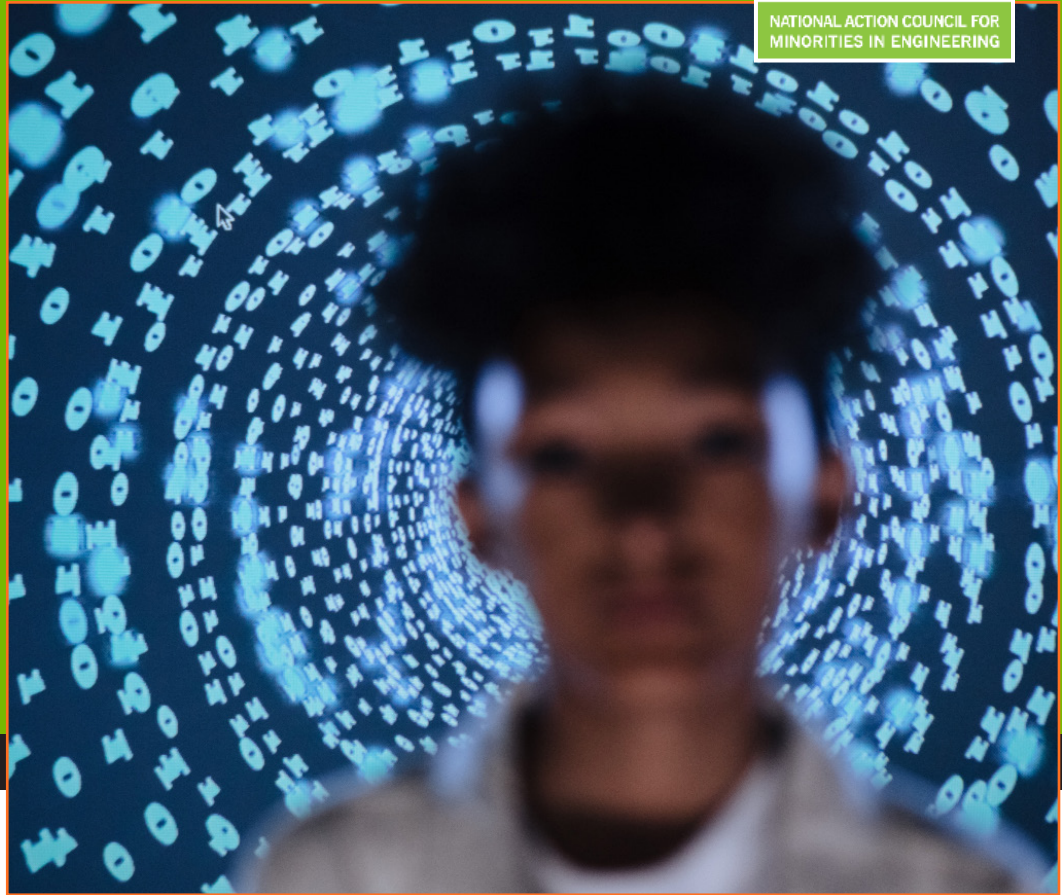


**NACME
RESEARCH BRIEF**



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Diversity

IN COMPUTER SCIENCE AND ENGINEERING: THE CONTRIBUTION OF HBCUS

The share of computer science and engineering bachelor's degrees awarded to underrepresented minorities—Hispanics or Latinos, blacks or African Americans, and American Indians or Alaska Natives—has increased over the past five years. For blacks or African Americans, historically black colleges or universities (HBCUs) have played an important role in awarding bachelor's degrees to students, many who later earn doctorate degrees in S&E fields, helping to advance representation in these fields by minorities. Despite this progress, these groups continue to be underrepresented among science and engineering degree recipients relative to their representation in the overall population.

In 2018, about 57% of bachelor's degrees in engineering fields were awarded to whites, and an additional 11% were awarded to Asians. A similar trend exists for computer and information sciences and support services with 50% of degrees awarded to whites, and an additional 15% were awarded to Asians. Temporary visa holders were awarded 11% of engineering and

8% of computer and information sciences and support services bachelor's degrees.¹

As depicted in the figure below, collectively underrepresented minorities earned approximately 18% of bachelor's degrees in computer and information sciences and support services and 15% of engineering bachelor's degrees, well below their +30% representation in the United States. Hispanics or Latinos earned 10% of computer and information sciences and support services and 11% of engineering bachelor's degrees; black or African American students, 8% and 4%; and American Indians or Alaska Natives, 0.5% and 0.3%.

Despite the fact that more institutions have become minority serving, HBCUs continue to pull their weight in degree production, especially in the STEM fields. While HBCUs, approximately 105 in count, represent less than 3% of the total number of degree granting institutions, in 2018 black or African American students earned 16% of engineering and 11% of computer and information sciences and support services at HBCUs.

2018 Engineering And Computer Science Bachelors Degrees By Race And Enthni City¹

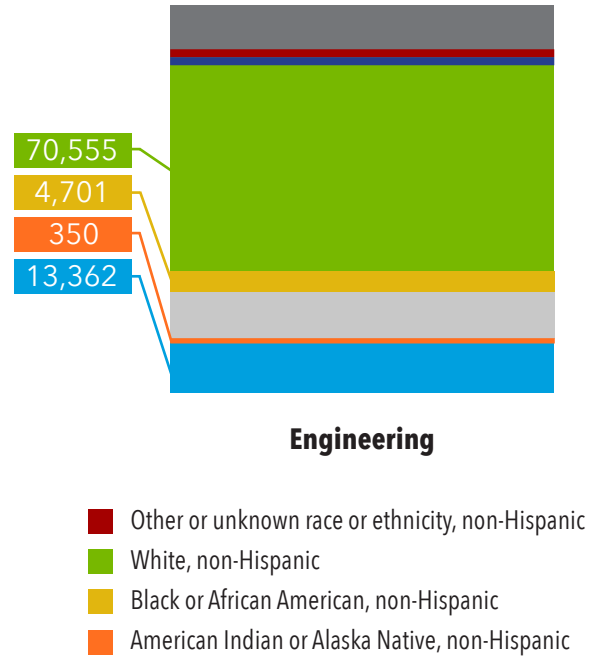
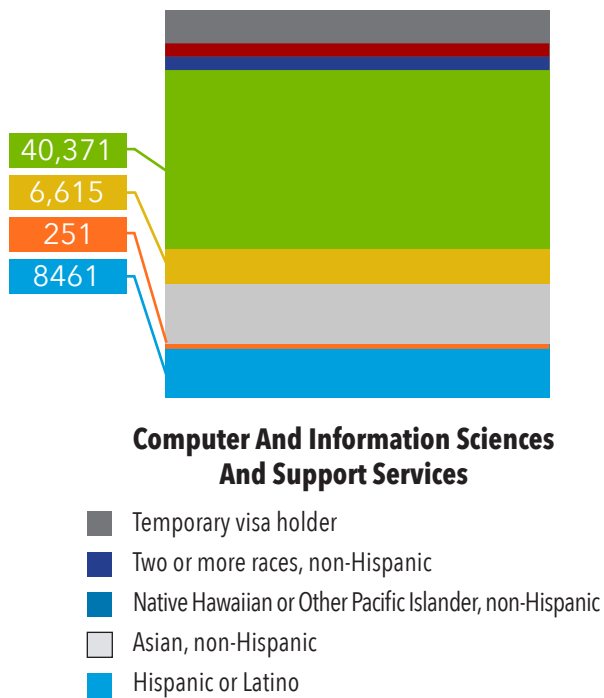


Table 1.0 Fraction of BS Degrees Earned at HBCUs by Black or African American Students for Recent Five Years

Fraction of Bachelor of Science Degrees Earned at HBCUs by Black or African American Students ¹					
	2018	2017	2016	2015	2014
Engineer	16%	17%	17%	20%	19%
Computer And Information Sciences And Support Services	11%	11%	12%	13%	13%

CONTINUED

However, the number of degrees awarded to African American women remains low, for both engineering and computer science fields. In 2018, Black or African American females earned 1240 (1%) of engineering degrees and 1745 (2%) of computer science degrees. HBCUs awarded 210 of the computer science degrees and 246 of the engineering degrees. Ten of the computer science degrees were earned at Spelman College¹. Spelman is a small liberal arts college for women that has a rich legacy of preparing African American women for careers in science and engineering. In 2004, Spelman awarded 30 bachelor's degrees in computer science, which represented approximately 6% of the total degrees granted that year for the college. Since this peak in 2004, there has been a steady decline in computer science degrees. The fraction of degrees awarded by Spelman in computer science has been as low as 0.2% in 2011 and most recently 2.5% in 2018¹. This decline can be attributed to many factors, but limited financial support is certainly a significant one as programs like NASA WiSE (Women in Science and Engineering) sunset.

Financial support in the form of scholarships like the NASA WiSE program contributed significantly to Spelman success in recruiting and retaining 100s of students. From its inception in 1987, the WiSE program sought to recruit strong, science-focused students. The program provided students with scholarships and unique opportunities such as NASA internships. Research findings illustrate the success of African American women who are graduates of Spelman Collegeⁱⁱ. Spelman, historically, has provided a platform through changing the discourse to disrupt existing and often outdated paradigms about who can be successful in science and engineering. As we seek to develop talent for our nation, certainly this is a time to double down on black women in STEM and garner more resources to build our STEM capacity.

Table 2.0 2019 BS Engineering Degrees Awarded by HBCUs to All Students and to African Americans

Spelman College Bachelor's Degrees Awarded from 2004 to 2018 ¹									
	2018	2017	2016	2011	2010	2009	2006	2005	2004
Computer and Information Sciences and Support Services	11	13	6	1	4	6	14	29	30
Engineering	0	0	1	1	0	2	7	4	2
Engineering Technologies and Engineering-Related Fields	0	0	0	2	3	3	0	0	0
Total All Majors	446	450	463	426	471	444	463	498	533

Spelman College Fraction of Engineering and Computer Science Degrees Awarded from 2004 to 2018									
Engineering			0.2%	0.7%	0.6%	1.1%	1.5%	0.8%	0.4%
Computer Science	2.5%	2.9%	1.3%	0.2%	0.8%	1.4%	3.0%	5.8%	5.6%

¹ NACME Analysis of Department of Education, National Center for Educational Statistics, Integrated Postsecondary Education Data System

ⁱⁱ Sidbury, C, J. Johnson and R. Burton, 2015. "Spelman's Dual Degree Engineering Program: A Path for Engineering Diversification". Changing the Face of Engineering, John Hopkins University Press, 2015.