

# The Interview Access Gap for Black Engineers

---



**Dr. Legand L Burge III**  
Howard University



**Dr. Katherine Picho-Kiroga**  
Howard University



**Portia Kibble Smith**  
Karat

## Introduction

The lack of diversity throughout the technology sector is not a new problem. Despite research clearly demonstrating the essential benefits of more diverse teams<sup>1</sup>, leadership, and perspectives; and despite nearly a decade of corporate programs<sup>2</sup>, the employment rates of Black software engineers remain disproportionately low. In 2020, 64 percent of software engineers in the United States were White, while just 6 percent were Black or African American<sup>3</sup>.

With the technology industry poised to be the primary industry for wealth creation over the next decade<sup>4</sup>, it is critical that we begin to genuinely identify and break down the systemic barriers that are preventing more diverse talent and points of view from thriving in computer science.

As major companies increase their focus on recruiting from Historically Black Colleges and Universities (HBCUs)<sup>5</sup>, it is crucial that the field truly looks at hiring practices to understand why past HBCU recruiting initiatives have fallen well short. According to research from Clemson University and Morehouse College<sup>6</sup>, “the technical interview is seen as the major barrier for most students who wish to gain entry-level software engineering positions at the top tech companies.”

The intent of this report is to help tech-driven organizations better understand the experiences of Black software engineers to build more inclusive technical interviewing and hiring programs. To accomplish this, [Karat](#), the global leader in technical interviews, partnered with Howard University to conduct a survey of over 300 Black computer science students and HBCU alumni. The majority of participants were enrolled in Howard University, Morehouse College, or University of North Carolina Charlotte. To better understand the lived experiences of our participants, our researchers also organized focus groups with students at Howard University.

### Methodology

This report uses benchmark questions asking participants how confident they are in their ability to succeed at technical interviews and engineering careers. The survey and accompanying focus groups, conducted in the Spring of 2021, asked students about levels and causes of interview anxiety and “imposter syndrome.” It also explored factors including how early students had access to their first computer and first computer science curriculum, the number of people they know working in the tech industry, and how much work and interview experience they have. Benchmark results can be found starting on page 11.



### Highlights

---

- ◆ Structural inequities delay exposure to computer science making it more difficult for Black software engineers to start careers in tech.
- ◆ Proximity and access to people working in tech improves confidence, but the under-representation of Black engineers limits that access for HBCU students.
- ◆ Interview practice can help close the access gap by building confidence and leads to more early career opportunities.

### What is a technical interview?

---

Technical interviews assess knowledge and abilities as they relate to specific jobs. They are most commonly used in the engineering, IT, and science fields. For the purposes of this research, we defined a “technical interview” as a software engineering interview involving live coding.

## Structural inequities limit access to the technology industry and impact career trajectories

Researchers found a strong association between early exposure to computer science and early career opportunities. Respondents who have had software engineering internships had access to their first PC nearly a full year earlier (average age 10.4 vs. 11.3 for no internship). They also had their first exposure to computer science education an average of two and a half years earlier (13.2 vs. 15.7). Similarly, half of respondents who have been coding for more than three years have had an internship compared to just 21 percent for those with one to three years of experience. “It wasn’t until high school that I even took a class that taught me about technology and about computers, and that ended up being my favorite class.” responded a senior student from UNC Charlotte.

Unfortunately, research suggests that Black high school students are less likely than White students (47 percent vs. 58 percent, respectively) to have classes dedicated to computer science<sup>7</sup>. This structural inequity has a lasting impact that puts college sophomores and juniors looking for internship experience at an immediate disadvantage compared to their White peers. Securing job opportunities only becomes more difficult without the internship experience that most tech companies value.

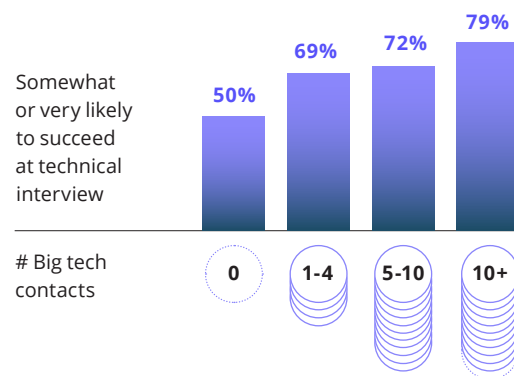
“My greatest challenge would have to be getting my foot in the door. I am actively searching for internships and research experiences. It is a long and daunting process.”

Junior, Morehouse College

On top of these access barriers, the underrepresentation of Black software engineers limits the ability of students to network and gain visibility into the hiring process. Nearly three quarters of our respondents knew less than five people working in big tech, and more than 25 percent reported knowing none. This lack of network has a definite negative impact on confidence.

### Access Builds Confidence

Just half of the respondents who didn’t know others working in big tech (defined in the survey as the top 10 tech companies in the USA by market cap: Amazon, Google, Apple, Microsoft, Adobe, Netflix, Cisco, Facebook, Salesforce, and Oracle), say they are somewhat or very likely to succeed in a technical interview. That number jumps to 69 percent for people who have one to four contacts in the industry, 72 percent for people with five to 10 contacts, and 79 percent for those who know more than 10 people working in big tech.



For Black computer science students, the lack of robust professional networks is even more noticeable in the startup space. Respondents were much more likely to have contacts working in big tech than at tech startups. 26 percent of respondents knew more than five people in big tech compared to 17 percent who knew more than five working at startups. 73 percent knew at least one person in big tech vs. 58 percent who knew someone working at a startup.

While this isn’t surprising considering Black founders receive roughly one percent of v funding<sup>8</sup>, it is a point of concern given the strong desire that many Black computer science students have to deeply innovate and create jobs. This was a key theme observed across several focus groups and interviews conducted in parallel with the survey.



**Dr. Katherine Picho-Kiroga**  
Assistant Professor, Educational Psychology, Howard University

“The good news, however, is that it appears that a little bit of networking goes a long way,”

noted Dr. Katherine Picho-Kiroga. “Knowing even just a few people in tech can make a big difference vs. not knowing anybody at all.”

This is encouraging because it suggests that there’s a tipping point that can be achieved relatively quickly by creating networking-effect benefits that will substantially improve interview confidence levels for future aspiring engineers.

“I want to change the image of a programmer, I want to put Black women on the map in the tech industry. I want to create something that helps others.”

Sophomore, Howard University

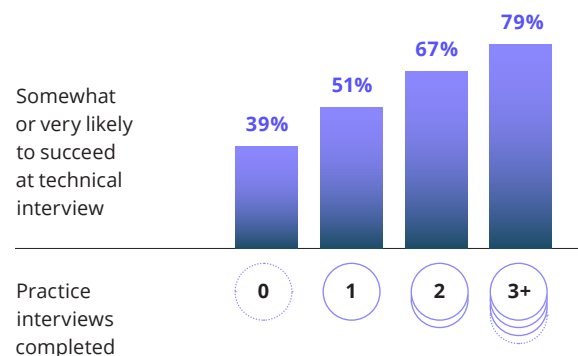


## Interview practice builds candidate confidence

The survey results demonstrate that practice interviews can help Black engineers overcome a lack of structural access and exposure to tech by building deeper sustained confidence.

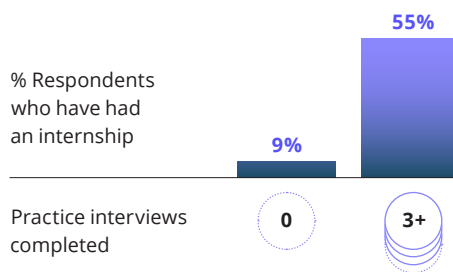
Just 39 percent of respondents who had never taken a practice interview believed they were either somewhat or very likely to succeed in a technical interview. Confidence levels increased with more practice, climbing to 79 percent of people with more than three practice interviews who say they are somewhat or very likely to succeed.

### Practice Interviews and Confidence



Karat's technical interviews are built on the premise that the most accurate hiring signal occurs when candidates have an opportunity to demonstrate their strengths as software engineers. Sixty-two percent of respondents surveyed indicated that past technical interviews had given them the opportunity to highlight their strengths. Like interview confidence, this number is also correlated with access to interview practice. Just 43 percent of respondents with no practice interview exposure felt they were able to highlight their strengths, compared to 76 percent of respondents, with more than three practice interviews.

Access to interview practice also had a significant impact on internships. Respondents with more than three practice interviews are six times more likely to have had an engineering internship compared to those who have never had one.



One noticeable gap is the percentage of respondents who have had no exposure to practice interviews (49 percent) compared to the number who have had at least one real coding interview (78 percent). This means that for many of the students in the survey, their first job interview could be the first time they ever experienced a technical interview. This directly impacts interview confidence, creates interview anxiety, and has a negative correlation with the ability to secure critical internships.



**Portia Kibble Smith**

Head of D&I, Executive Recruiter, Karat

Portia Kibble Smith, Head of D&I and executive recruiter at Karat, heard similar feedback from focus groups

and student workshops. "A lot of the HBCU students we interviewed were first-generation college students," noted Kibble Smith. "They don't have a clear understanding of what goes on in a technical interview until they're interviewing for their first internship, and they don't have anyone in their networks to ask for advice. This makes interview practice and transparency about the hiring process essential to closing the access gap."

## Interview anxiety and imposter syndrome

For many early-career software engineers, the technical interview is the most daunting obstacle to starting a career in tech.

More than twice as many respondents said they were unlikely or very unlikely to succeed in a technical interview compared to succeeding in an engineering job. This suggests that the students are more confident in their ability to succeed in an engineering role if they have time to prove themselves.

"Knowing that there are students at top universities interviewing for the same role, and I feel like because I go to an HBCU there's already this misconception that my skill set is not comparable, so there might be bias in the interviewing process."

Senior, Howard University



**Dr. Legand Burge III**  
Professor of Computer Science,  
Howard University

According to Dr. Legand Burge III, Professor of Computer Science at Howard University, the standard technical interview format, a timed coding exercise, can be a barrier in and of itself. “Students are afraid to fail at interviews,” shared Dr. Burge.

“Many of our HBCU students have hustled their whole lives. They are problem-solvers who know how to tap resources to be successful. Putting time constraints in an interview environment creates added pressure, stress, and anxiety.”

Qualitative findings from the survey support this. When asked to describe their strengths, “ability to learn,” and “problem-solving” were two of the most common responses from participants who were not able to highlight their strengths in past interviews.

Interview anxiety can be especially detrimental for people who are already under pressure to conform to cultural norms and present themselves a certain way. “If you are interviewing at Google and see a white man pacing back and forth and scratching his head, it’s interpreted as creative problem solving,” continued Dr. Burge. “Many Black students from HBCUs go into interviews more subdued or self-conscious, intentionally trying to avoid the perceived stereotype of being ‘big and bad.’ Natural physical reactions to stress like sweat and shiftiness are perceived very differently for Black candidates, and this social identity threat<sup>9</sup> amplifies the impact of interview anxiety.”

**Social identity threat is the psychological experience of being socially devalued by virtue of belonging to a stigmatized group<sup>10</sup>.**

## Interview confidence and imposter syndrome

The survey also examined the intersection of interview confidence and imposter syndrome, defined as **the psychological pattern in which an individual doubts their skills, talents, or accomplishments and has a persistent internalized fear of being exposed as a fraud<sup>11</sup>.**

Interestingly, researchers observed only slight differences between interview confidence levels across individuals with low imposter syndrome and high imposter syndrome levels, while respondents with high levels of imposter syndrome were significantly less confident when it comes to success on the job.

This difference suggests that “imposter syndrome” is a persistent challenge for Black engineers throughout their careers, extending past the interview. It also means that retaining and promoting Black engineering talent will require its own set of cultural changes across the tech industry that go beyond making the hiring process more inclusive.

- ◆ People with low levels of imposter syndrome were nearly twice as confident in their ability to succeed in an engineering job. Thirty-five percent of respondents with low imposter syndrome said they were very likely to succeed, compared to just 19 and 18 percent of respondents with moderate and high levels, respectively.
- ◆ Unlike interview and job confidence, imposter syndrome had very little correlation with access to practice interviews, internships, and knowing people in the tech sector.
- ◆ One of the biggest factors that impacts imposter syndrome is early access to computer science education. Low imposter syndrome respondents averaged their first exposure to computer science at 12.8 years, compared to over 15 for moderate and high imposter syndrome levels.

These challenges were even more acute for Black women in the study, who face a compounding effect of gender and racial bias in White-male dominated spaces<sup>12</sup>. Women reported feeling extreme levels of interview anxiety twice as frequently as their male counterparts. Thirty-seven percent of women rated their interview anxiety at a 9 or 10 on a scale of 0-10 compared to just 18 percent of men. Women also demonstrated high levels of imposter syndrome more frequently than men (40 percent compared to 31 percent).

“I am so nervous that interviewers won’t like me or that I will say something that makes it seem that I am unable to do the job or any job in the field for that matter. Also, because I am a dark skin plus-sized-woman, I worry about not looking the part for someone in a business setting.”

Senior, UNC Charlotte

## Closing the Interview Access Gap

People with earlier experiences with technology and computer science education, more networking exposure to the tech sector, and access to practice interviews have higher confidence and get job offers at higher rates.

While our research did not benchmark the HBCU data against predominantly White institutions (PWIs), our hypothesis is that Black software engineering students at HBCUs have less access to these critical factors compared to their White peers.

Socioeconomic factors such as access to personal computers and computer science education at an early age require long-term investments and systemic changes to American primary education, but there are also immediate ways for organizations to build more equity into hiring today.

We’ve identified three steps organizations can take to level the playing field, improve diversity, and increase hiring yields for technical talent:

- 1 Make the interview process transparent
- 2 Create interview practice opportunities with second chances
- 3 Foster inclusion with support and structure

### 1. Make the interview process transparent

When candidates have inside knowledge of a company and its hiring process due to networking or referrals they are better prepared. Hiring managers should ask themselves if a candidate who is interviewing without knowing anyone at their company has the same understanding of the interview process and questions as one who has an “in” with someone on the team.

If there is information that you’d be willing to share with one of your friends or former colleagues, publish that information so it is accessible to all candidates. Failing to do this will artificially benefit people from similar backgrounds as your existing team, resulting in hires that consciously or unconsciously prioritize interpersonal relationships and subjective “likeability” over skill. Consequently, this leads to less diverse, and ultimately less effective teams, hurting both the efficiency and equity of the hiring process.

Include all relevant details around the hiring process, including tips, sample questions, resources, what to expect, etc. into a public-facing web page for all interested candidates. At a minimum, tell candidates which competencies are being assessed in an interview, what success looks like, and if it’s encouraged or discouraged to ask clarifying questions during the interview.

Qualitative analysis also suggests that diversifying interview loops will help alleviate interview anxiety. Discussions in our focus groups emphasize that Black candidates want to see if their future employer is committed to diversity by seeing diversity reflected in their interview loop. Even if your team doesn't have other Black software engineers, demonstrate your culture of inclusion by presenting a diverse slate of interviewers.

**"My greatest challenge is not seeing a lot of women, especially Black women, in the field."**

Senior, UNC Charlotte

Additionally, give candidates an opportunity to familiarize themselves with their surroundings before the interview. If it's a virtual interview, provide advanced access to the developer environment. If it's an in-person interview, allow candidates to schedule a preview tour to get a sense of the security and sign-in process at your office, which can be a cause of interview anxiety for Black candidates who may not look like the majority of your employees.

## 2. Create interview practice opportunities with second chances

Offer multiple interview opportunities to candidates. One way to do this is by giving candidates the ability to redo their technical interview if they're not satisfied with their performance.



Out of more than 110,000 interviews conducted by Karat, about 18 percent of all candidates elect to redo their interview with a new interviewer and new questions.

More than half of all candidates improve from their first to second interviews, and that number jumps to over 60 percent for candidates from underrepresented backgrounds. Even more significant, 18 percent of



underrepresented candidates improve their scores by 30 percentage points or more. Furthermore, in Karat's industry experience, candidates who pass their redo interviews are more likely to accept job offers, which gives the redo comparable hiring efficiency to sourcing new candidates from both a cost and time standpoint.

If offering a blanket redo option to all candidates is unfeasible, develop a system to provide feedback and re-interview candidates who are close to meeting your hiring bar. If you have a promising candidate who just missed the criteria, give them constructive feedback and ask them to come back for another interview. Not only will you end up with a significant number of hires from this cohort, but you'll also get a valuable hiring signal about a candidate's ability to learn from constructive feedback.

The preliminary results from Karat's [Brilliant Black Minds](#) practice interview program also reinforce this best practice. Brilliant Black Minds offers HBCU computer science students multiple practice interviews. After each interview, students received written and verbal feedback on their strengths and opportunities for growth, followed by a second interview opportunity. Seventy-six percent of participants who received practice interviews focusing on data structures maintained or improved their scores, and 85 percent of participants who received algorithm interviews maintained or improved.

### 3. Foster inclusion with support and structure

Focus group participants noted a perceived lack of respect for and appreciation of their intelligence and educational acumen among potential employers. Participants also specifically called out feeling “out of their depth” when trying to interact or socialize with colleagues from PWIs. Several mentioned they “never really felt a part of the team.” Engineering teams can create a more inclusive culture by providing support for Black engineers in the form of mentorship opportunities and creating a more transparent structure around roles and compensation.

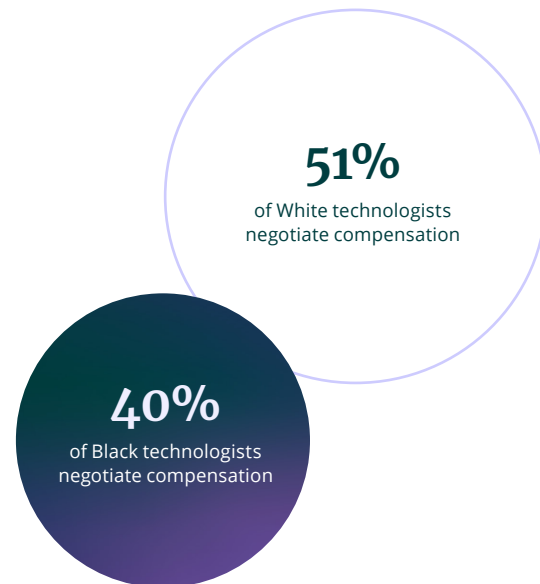
#### The critical role of mentors

Internships often serve as extended interviews. Create structured goals and metrics for what a successful internship looks like. This is especially critical for startups looking to hire from HBCUs, as the participants in the study had even less exposure to tech startups than they did to big tech. By making it clear what is expected and what it will take to get hired full time, managers can start to break down the cultural barriers that the lack of access creates.

Engineering managers can address these issues by providing structured mentorship opportunities and professional development resources. Mentor roles should come from outside of the direct reporting structure to answer questions about promotions, expectations, benefits, and compensation/negotiation.

#### Salary equity, negotiation, and transparency

Negotiation training emerged from the study as a particular area of need. Respondents rated salary negotiation as the area of the hiring process that they are least prepared for (full preparedness chart in the appendix). This is also reflected in the real world. According to the engineering job site, Dice.com, 51 percent of White technologists said they negotiated compensation at that new job and company, only 40 percent of Black technologists reported the same<sup>13</sup>.



A lack of salary negotiation can have a lasting impact on someone’s earning potential across their entire career. Furthermore, “negotiation” was the most popular workshop session from last year’s Brilliant Black Minds program, led by Portia Kibble Smith and Lusen Mendel, Director of Developer Relations at Karat, and professional negotiation coach. According to Kibble Smith, “a lot of our participants didn’t even realize that negotiation was part of the hiring process; they were just happy to have a job offer.”

Low self-efficacy may contribute to a hesitance to negotiate. Previous research from the Journal of Business and Psychology concluded that possessing a higher sense of self-worth and confidence in one’s abilities produces higher salary expectations<sup>14</sup>.

Salary transparency and structured pay bands can also help, especially for entry-level engineering positions. By sharing open and honest data about what someone at their company at each level should be earning, employers can build transparent pay ranges into their leveling documentation. It’s a growing trend<sup>15</sup> in the corporate world, and in Black tech circles<sup>16</sup>.

## Conclusion

Ten years ago, more than half of CEOs expressed concern about the shortage of technical talent as a material threat to their business. In 2019 that number had climbed to 79 percent<sup>17</sup>. Since then the tech industry's growth has exploded, fueled by remote work and the growing demand for technical solutions. Every company is turning to software. But there aren't enough software engineers, and the movement of talent is accelerating. Organizations can't afford to miss out on talent.

Today's interviewing status quo puts Black engineers at a disadvantage due to the systemic lack of exposure and access to the industry. This artificially constrains the talent pool and limits the number of hires that a company can make. It also limits the diverse perspectives and backgrounds in the room, which stifles innovation and makes the tech we all use less reflective of the world it serves. That is a business problem that the industry is finally starting to recognize. Ninety-four percent of CEOs in the 2021 Fortune/Deloitte survey listed DEI as a personal strategic priority.

The shift to remote work is one step in the right direction. According to a recent Harvard Business Review study, 63 percent of tech leaders reported that remote interviewing and increased remote work roles have led to the biggest impact on diversity in their technical teams. Remote work breaks down geographical barriers that have previously separated Black engineers from cutting-edge tech companies. More organizations have the opportunity to get out of their limited referral networks and recruit from HBCUs. But they also must ensure that they're setting Black employees up for success in the hiring process by reducing the inconsistencies and bad interviewing practices that cause anxiety and produce false negatives. This can be achieved by adding transparency, creating practice opportunities, and providing career support for Black employees.

There has never been a shortage of brilliance in Black America. Only limits to the exposure, access, and fairness offered. The 300 students who participated in this survey represent just a small fraction of the deep pool of young and brilliant talent coming from HBCUs.

**They are entering the job market and bringing their unique perspectives and talents to the world of tech. Is your company ready for them?**

### karat<sup>^</sup>

Karat unlocks opportunity by conducting predictive, fair, and enjoyable interviews for the world's largest and fastest-growing companies. Karat's human+tech approach uses the world's first interviewing cloud to enable a global network of Interview Engineers. The expertise and data generated from hundreds of thousands of interviews produce a trusted hiring signal that unlocks developer productivity, accelerates hiring, drives transparency, and promotes equity. Karat is building innovative products and services like the Brilliant Black Minds program with an eye towards becoming the developer talent platform and accelerating the journey from how developers find jobs to how they grow in their careers

### Brilliant Black Minds

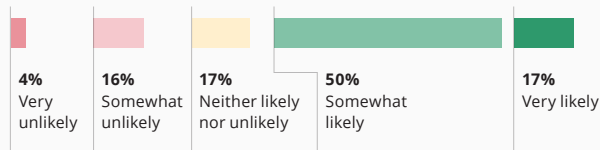
For hundreds of years Black people have innovated and disrupted every industry and facet of American life. The Brilliant Black Minds program honors this heritage of genius by supporting engineering in the Black community. Working with organizations like Howard University, Morehouse College, and Jopwell, Karat is offers practice interviews, live coaching, and professional development workshops to Black software engineers. The results will mean thousands more Black engineers sharing their brilliance and critical perspectives at the tech companies that influence the ways we all live.

# Appendix

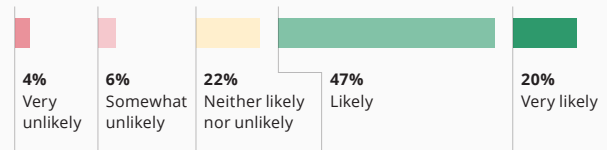
## Interview and career confidence benchmarks

One important area of analysis was the perception of respondents' own abilities. Key benchmark questions include "How likely are you to succeed in a technical interview?" and "How likely are you to succeed in a software engineering job?" Respondents answered on a scale of "very unlikely," to "very likely." For the purposes of this report, we considered the two highest response tiers to represent higher levels of confidence compared to the other responses.

**How likely are you to succeed in a technical interview?**

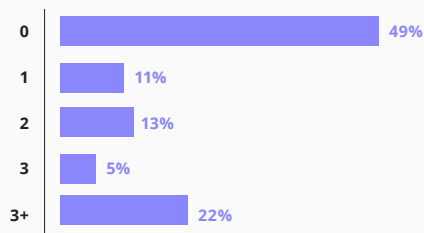


**How likely are you to succeed in a software engineering job?**

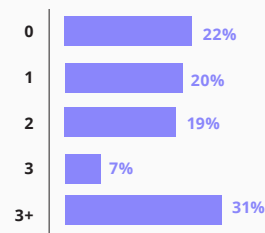


## Interview practice and networking

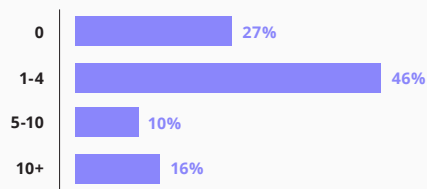
**How many practice interviews have you taken?**



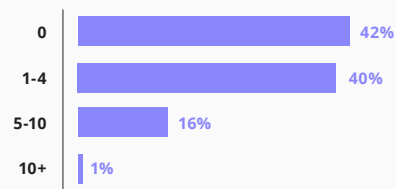
**How many coding interviews have you taken?**



**How many people do you know working in big tech?**



**How many people do you know working in tech startups?**

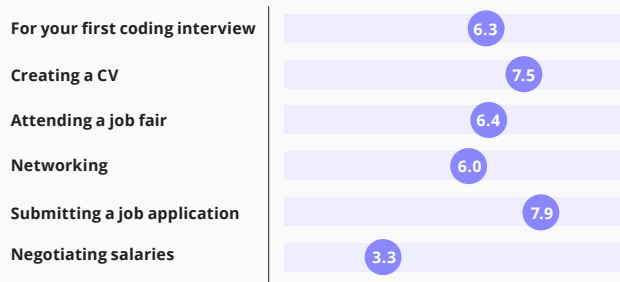


## Interview anxiety, preparedness, and imposter syndrome

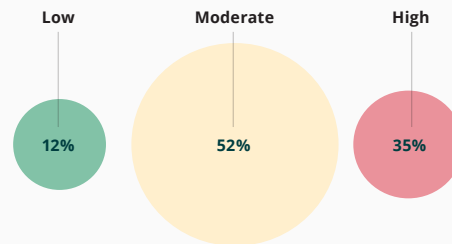
The survey measured levels of “interview anxiety” and “preparedness” for a variety of interview and hiring-related activities on a scale of zero to ten, where higher scores represented higher levels of the traits being assessed. It also asked a series of questions designed to measure levels of imposter syndrome.

The average level of “interview anxiety” was 6.5, indicating moderate to high levels of anxiety, and nearly nine in ten respondents demonstrated moderate or high levels of imposter syndrome.

### On a scale of 1-10 how prepared do you feel...



### Imposter Syndrome Levels



## Citations

---

1. Holger, D. (2019, October 26). *The business case for more diversity*. The Wall Street Journal.
2. Harrison, S. (2019, October 1). *Five years of tech Diversity Reports—and little progress*. Wired.
3. *2020 annual averages – employed persons by Detailed occupation, sex, race, and Hispanic or Latino ethnicity*. U.S. Bureau of Labor Statistics. (2021, January 22).
4. Block, F. (2020, May 14). *Technology will continue to be the primary industry for wealth creation over the next decade*. Barron's.
5. Alcorn, C. (2021, August 12). *Major companies are recruiting MORE HBCU grads than ever before, Administrators say*. CNN.
6. Hall Jr., P., & Gosha, K. (2018). The effects of anxiety and preparation on performance in technical interviews For Hbcu computer science majors. *Proceedings of the 2018 ACM SIGMIS Conference on Computers and People Research*.
7. Google. (2016). *Diversity Gaps in Computer Science: Exploring the Underrepresentation of Girls, Blacks and Hispanics*.
8. Adéchi, J.-P. (2020, November 17). *Why do white men raise more vc dollars than anyone else?* Techstars.
9. *Stereotype threat widens achievement gap*. American Psychological Association. (2006, July 15).
10. Steele, C. M., Spencer, S. J., & Aronson, J. (2002). *Contending with Group Image: The Psychology of Stereotype and Social Identity Threat*, 34, 379–440.
11. Clance, P. R. (1986). In *The impostor phenomenon: When success makes you feel like a fake* (pp. 20–22). essay, Bantam Books.
12. Charleston, L. V. J., George, P. L., Jackson, J. F., Berhanu, J., & Amechi, M. H. (2014). Navigating underrepresented STEM spaces: Experiences of black women in U.S. computing Science higher education programs who actualize success. *Journal of Diversity in Higher Education*, 7(3), 166–176.
13. Kolakowski, N. (2021, March 24). *Are all genders and races in tech getting paid what they're worth?* Dice Insights.
14. Avery, D. R. (2003). Racial differences in perceptions of starting salaries: How failing to discriminate can perpetuate discrimination. *Journal of Business and Psychology*.
15. Stuber, S. (2020, February 5). *This company published every employee's salary online. Did it make pay more equal?* The Guardian.
16. Kirby, D. (2021, March 29). *How I got here: The change that helped Taylor Poindexter stay — and grow — in tech*. Technical.ly DC.
17. *Talent Trends 2019: Upskilling for a digital world*. PWC: Talent Trends 2019. (2019).