June 2025

The Computer Science/Information Technology Education Market

An update on all things related to the demand for Computer Science/Information Technology Education in the United States.

VALIDATED INSIGHTS INC

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Brady Colby
Head of Market Research,
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The “Dot-Com Era”, and the ensuing “Dot-Com Bubble” as well as the 2008 financial crisis both had significant Impacts on the labor force, and ultimately the higher education system. However, recent technological innovations and macroeconomic trends are currently swinging higher education in a similarly violent manner.

The current changes, and projected future changes have triggered a substantial uptick in demand for, and interest in technical computer skills. Colleges and universities have been thrust into competition with industry providers in an effort to keep up with this influx of demand. It is our hope that readers of this report gain a thorough understanding of the rising demand for Computer Science/Information Technology programs.

Introduction

Computer Science & Information Technology (henceforth referred to as CS/IT) has been a growing portion of the U.S. workforce for decades. Accordingly, CS/IT has been a growing portion of higher education as well. More recently, CS/IT has departed the realm of “emerging” fields of study, and the field now has a substantial *volume* of students to mirror the *growth*.

On a macro level, business digitization has led to a massive influx in both supply and demand for Tech professionals. With the uptick in attention given to technology, advancements have abounded, and a large swath of the workforce is in a never-ending race to keep their skills up to par with the latest trends.

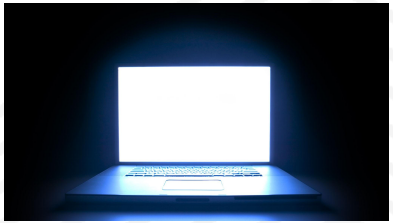
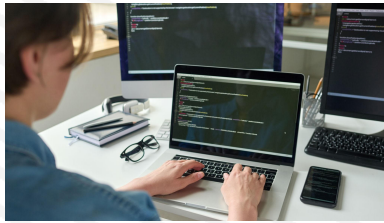
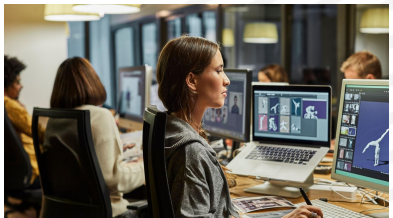
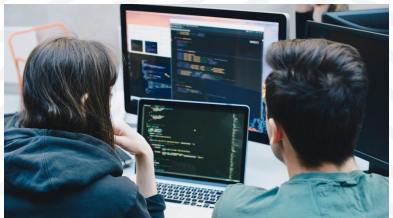
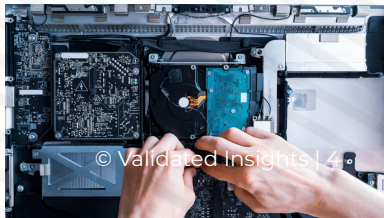
All of this has combined to create a substantial and growing population of people interested in learning foundational technical computer skills, and a further substantial and growing population of people needing to deepen their technological expertise.

The CS/IT Education Market houses a number of academic programs that have great potential for future enrollment growth. This report is a contribution to the body of knowledge meant to help institutions rise to the occasion and meet this demand.

Subjects Evaluated

- Artificial Intelligence/Machine Learning (AI/ML)
- Computer Science (CS)
- Cybersecurity
- Data Analytics/Science
- Programming & Software Engineering

This report primarily focuses on bachelor's and master's degrees in the aforementioned fields of study.

Key Findings

Employment in CS/IT roles has grown, and will grow, significantly faster than the aggregate labor market.
Tech employment stood at 6.0 million in 2024 and has significantly outperformed the overall labor market, and is projected to continue to do so.

- From 2001 to 2020 total employment grew at a 0.4% CAGR while Tech employment grew at a 2.2% CAGR.
- From 2023 to 2033 total employment is projected to grow at a 0.4% CAGR while Tech employment is projected to grow at a 1.9% CAGR.

A few key areas within Tech are specifically poised for even more rapid employment growth.
While employment in Tech is projected to grow strongly over the next decade, the growth will be particularly pronounced in a few key sectors.

- Data Analytics/Science roles represented only about 3% of Tech jobs in 2023 but there were an additional 4 million people employed in these roles outside of Tech. Employment in these occupations is projected to grow 33.5% over the next decade, the fastest growing on any evaluated category.
- Cybersecurity comprised about 21% of Tech employment in 2023 and employment in these roles is project to grow 30.4% over the next decade.

Enrollment in CS/IT programs is growing significantly faster than all higher education enrollments.
This growth led to a significant influx in the number of students enrolled in, and completing CS/IT programs in higher education.

- From 2011 to 2023 all CS/IT completions grew at a 9.5% CAGR compared to all completions which grew at just a 1.3% CAGR.
- The share of all completions that were in the field of CS/IT grew from 2.3% in 2011 to 5.8% in 2023.
- From Fall 2019 to Fall 2024, enrollment in CS/IT programs grew at a 7.2% CAGR while all enrollment grow at just a 0.03% CAGR.

Online enrollment in CS/IT programs, in particular, have grown at an accelerated rate in recent years.
The growth has not only been observed in the aggregate, but online programs in these fields in particular are seeing significant growth.

- From Fall 2019 to Fall 2024 online enrollment in CS/IT programs grew at a 10.4% CAGR, a significant acceleration from the 5.7% CAGR observed between 2014 and 2019.
- From 2019 to 2024 the share of online students pursuing a program in CS/IT grew from 10% to 12%.

The Computer Science/Information Technology Education Market

Student Demand Trends

CS/IT Student Demand Trends

Student demand for CS/IT programs is expanding rapidly, significantly outperforming higher education in aggregate. This trend has been true since at least the turn of the century, and CS/IT programs continue to outperform in recent years following the pandemic.

3X **Computer Science/Information Technology program completions tripled from 2011 to 2023.**

From 2011 to 2023 completions of CS/IT programs (across all award levels) tripled from 96 thousand to 286 thousand. More recently, from Fall 2019 to Fall 2024, enrollment in CS/IT programs grew at a 7.2% CAGR. As of Fall 2024 there were 1.33 million students enrolled in these programs.

Growth has been even more pronounced for both graduate programs as well as online programs in CS/IT fields. Over the past five years graduate enrollment in these programs grew at a 13.8% CAGR and online enrollment grew at a 10.4% CAGR. This online enrollment growth has outpaced the aggregate online higher education market, as CS/IT programs' share of online enrollment grew from 10% in 2019 to 12% in 2024. Even with this growth, the percentage of university leaders indicating that the believe CS/IT programs are particularly poised for online enrollment growth over the next five years doubled from 13% in 2019 to 26% in 2024.

Going forward, projections indicate that online enrollment in bachelor's-level Computing programs will grow 21% and online enrollment in master's-level Computing programs will grow 24% from 2023/24 to 2026/27.

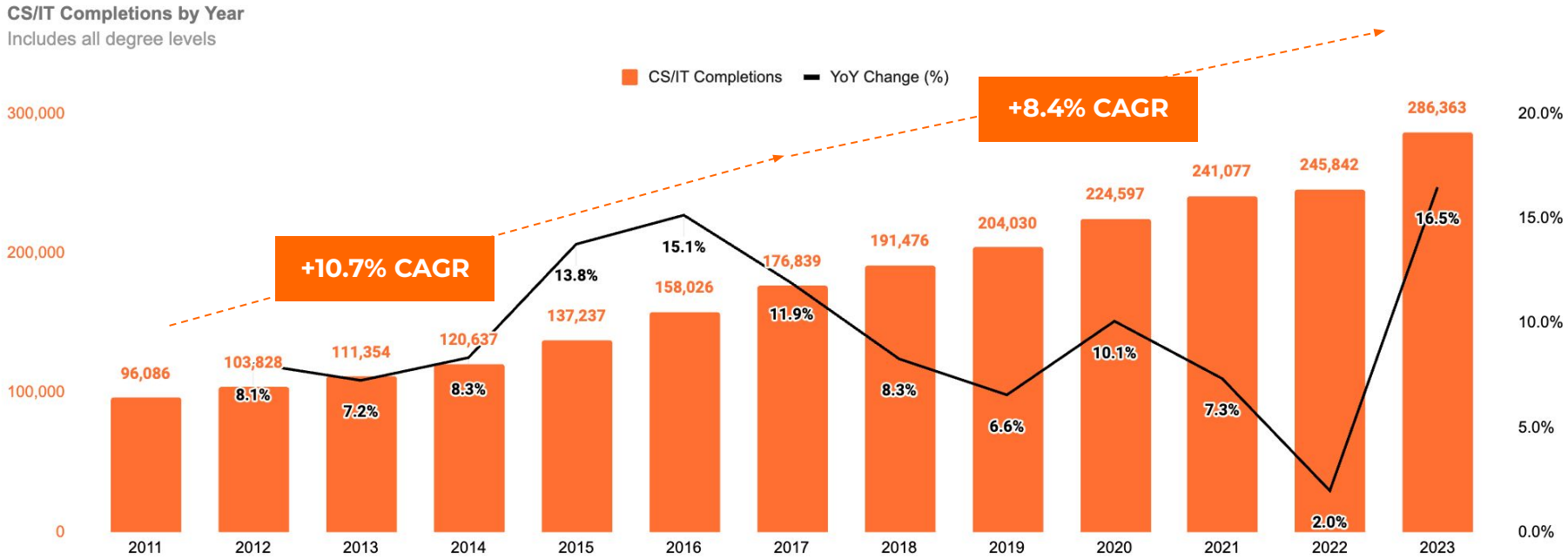
Surveys of various prospective student populations paint a bit more complex picture, but still reveal growing demand. For example, the share of recent high school graduates entering college (referred to as "Traditional College Freshmen") that are interested in studying Computer Science (the specific field of study) has remained relatively flat at about 3.5% for the past decade (11% are interested in the broad field of CS/IT). At the same time, more and more students are taking Computer Science coursework in high school which has been shown to drive interest in studying Computer Science in college.

Among prospective adult undergraduate students, the percent of the population interested in studying CS/IT has remained flat at 12% (only for "committed" prospects), however that is growth from a few years ago as 8% of recent adult undergraduate completers pursued programs in CS/IT. Among prospective graduate students, the share of the population interested in CS/IT grew from 9% in 2019 to 11% in 2023, however if only "committed" prospects are included, the share interested in CS/IT grew from 14% in 2021 to 17% in 2024.

STUDENT DEMAND

CS/IT completions grew 3X from 2011 to 2023

From 2011 to 2023 all CS/IT degree completions grew at a 9.5% CAGR. From 2011 to 2017 the CAGR was 10.7%, and from 2017 to 2023 the CAGR was down a bit to 8.4%.



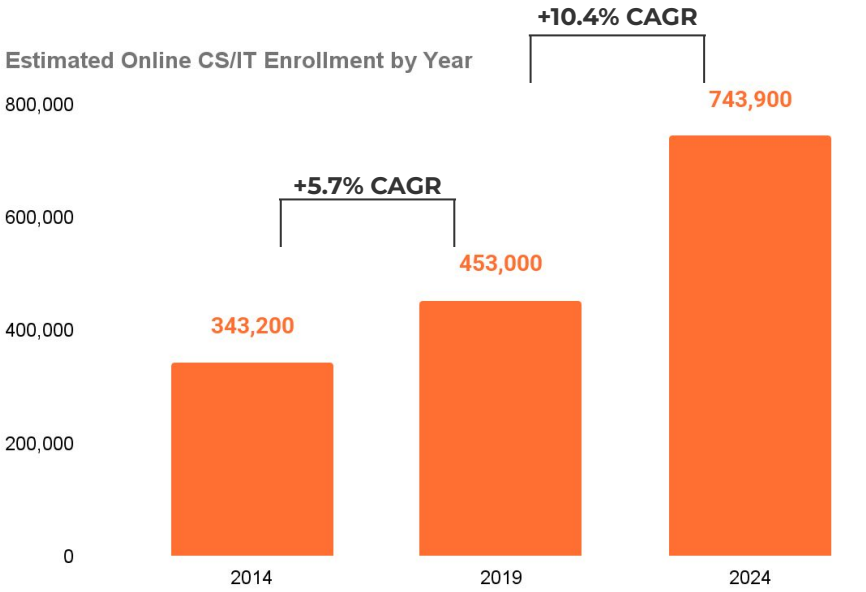
Source(s): Computing Research Association (CRA) with National Center for Education Statistics (NCES) IPEDS

STUDENT DEMAND

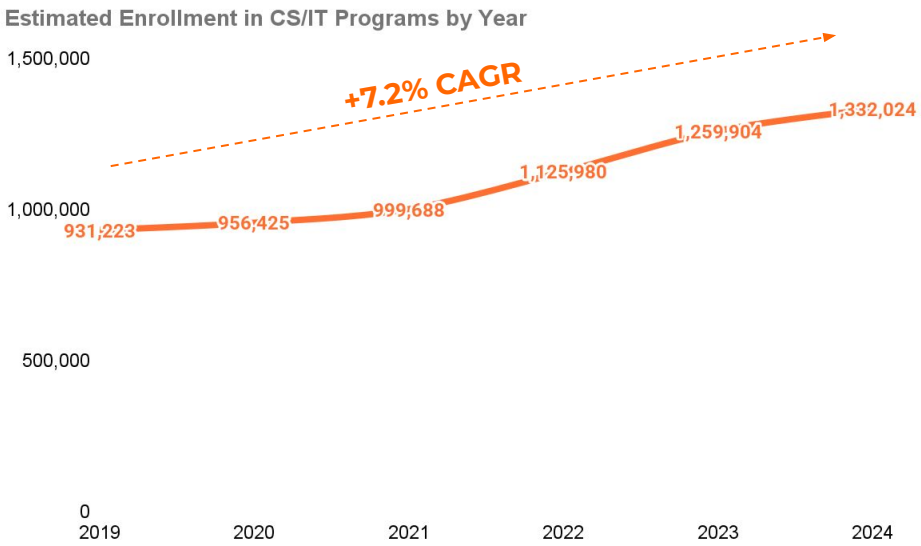
CS/IT enrollment is growing, online CS/IT enrollment is growing faster

From Fall 2019 to Fall 2024 total CS/IT enrollment grew at a 7.2% CAGR to over 1.3 million. Online CS/IT enrollment grew at a 10.4% CAGR during that time to ~743,900.

Online CS/IT enrollment grew at a 5.7% CAGR from 2014 to 2019. From 2019 to 2024 growth accelerated to a CAGR of 10.4%. As of 2019, 49% of CS/IT enrollments were in online programs, by 2024 that share was up to 56%.



From 2019 to 2024, enrollment in CS/IT programs (across all program modalities) grew at a 7.2% CAGR, this means that on-campus CS/IT enrollment grew at only a 4.2% CAGR.



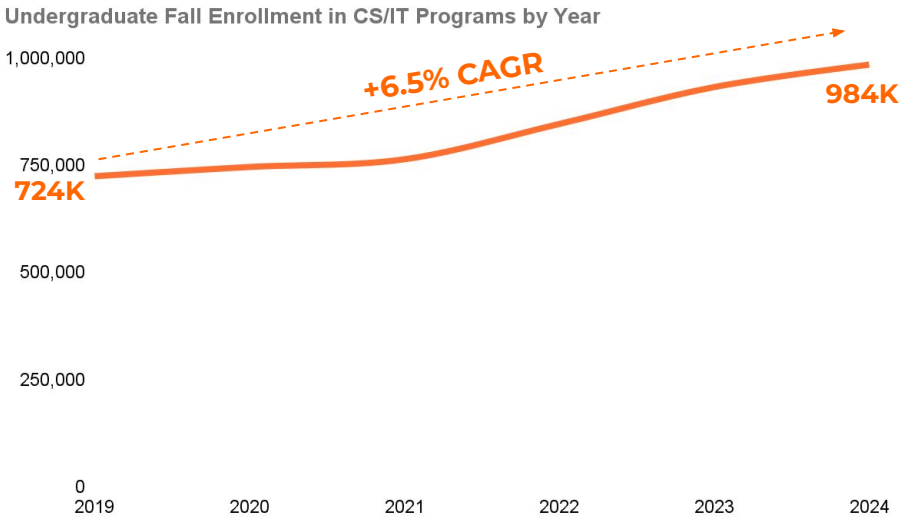
Source(s): For chart on the left: BestColleges, EducationDynamics, National Center for Education Statistics (NCES) IPEDS, and The Learning House, Validated Insights analysis. For chart on the right: National Student Clearinghouse (NSC) Research Center, Validated Insights analysis

STUDENT DEMAND

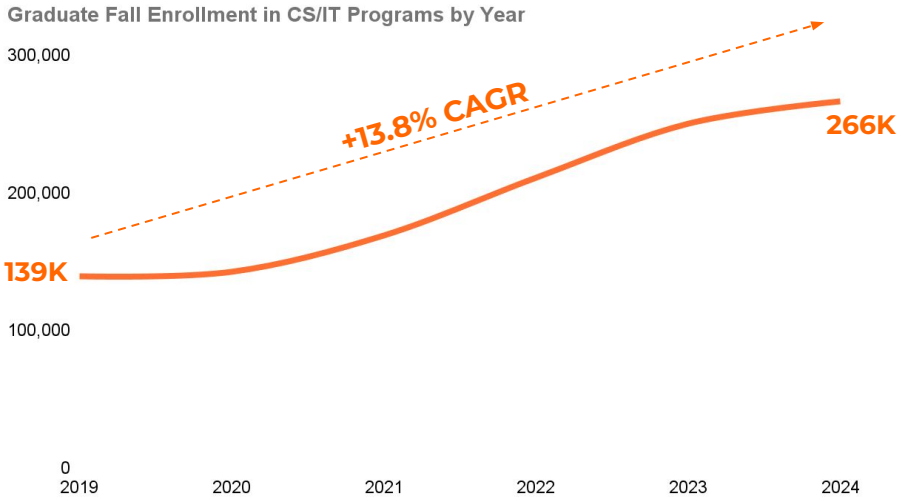
Graduate enrollment in CS/IT is booming

While all CS/IT enrollment grew at a 7.2% CAGR from Fall 2019 to Fall 2024, graduate enrollment in these programs in particular grew even faster at a CAGR of 13.8%.

Undergraduate enrollment in CS/IT programs grew at a 6.5% CAGR from Fall 2019 to Fall 2024.



Graduate enrollment in CS/IT programs grew at a 13.8% CAGR from Fall 2019 to Fall 2024.



Source(s): National Student Clearinghouse (NSC) Research Center

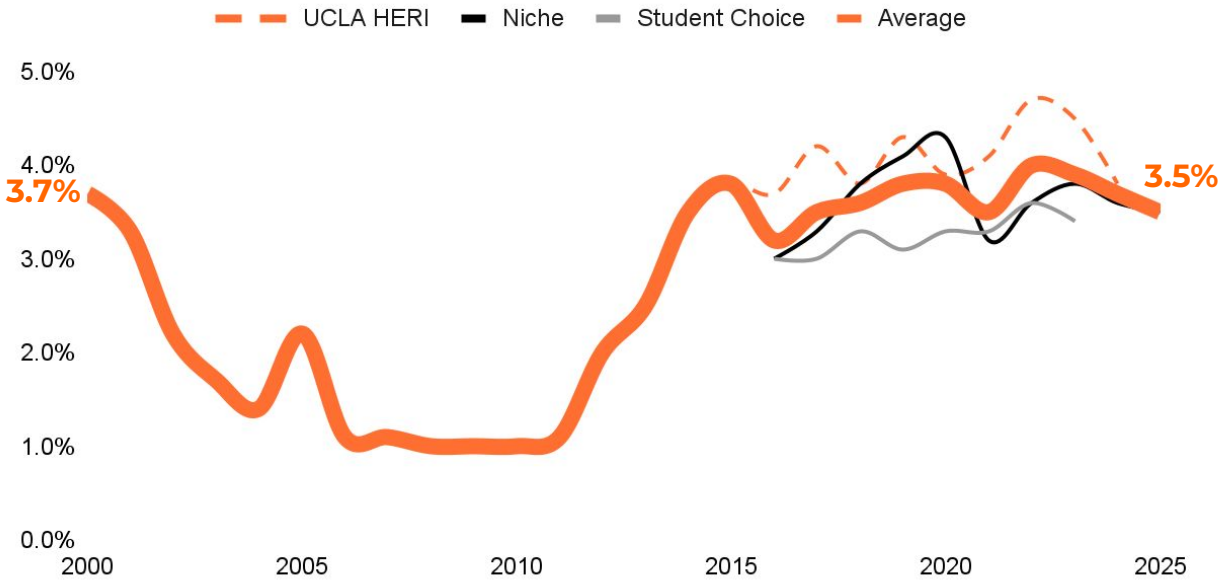
Interest in majoring in CS dipped but has since grown

From 2000 to 2008 interest in majoring in Computer Science steadily declined. After a brief growth period, this interest has been mostly flat since 2015.

Traditional Undergraduates

Percent of Traditional College Freshmen Interested in Computer Science

"Traditional College Freshman" is defined as teenagers who recently graduated high school



Hanover Research performs a similar study but uses broader major categories. Their 2025 survey found that 11% of this prospective student population was interested in the broader field of Computer Science/IT as opposed to the specific major of Computer Science.

Key Takeaways

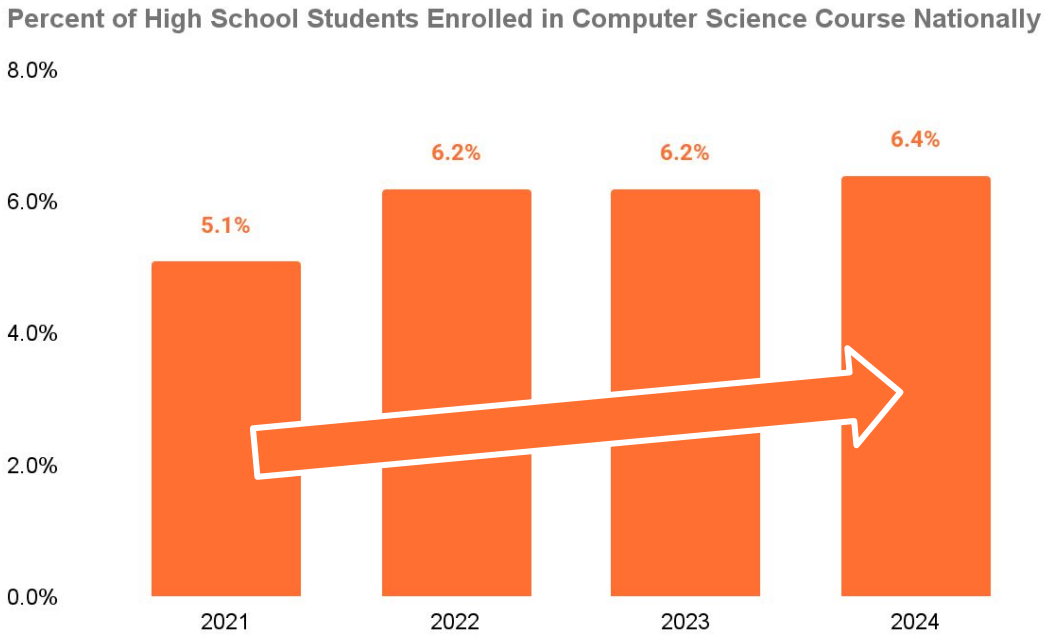
- Among traditional college freshmen, interest in studying Computer Science dipped following the *Dot-Com Bubble*, then surged following the 2008 financial crisis, and has been largely steady since about 2016.
- Almost one-third (31.8%) of traditional college freshmen interested in the broad field of Computer Science/IT are specifically interested in Computer Science as of 2025.

Source(s): Hanover Research, Niche, Student Choice, and UCLA HERI, Validated Insights analysis, data shows percentage interested in studying the *specific* major of Computer Science as opposed to the broad category

STUDENT DEMAND

Expanding access to CS education in HS is driving interest

As the percentage of high school students that enroll in Computer Science coursework grows, research shows that interest in majoring in CS does too.



Taking a Computer Science course in high school increases the likelihood that a student will declare Computer Science as their major in the future by 10%.

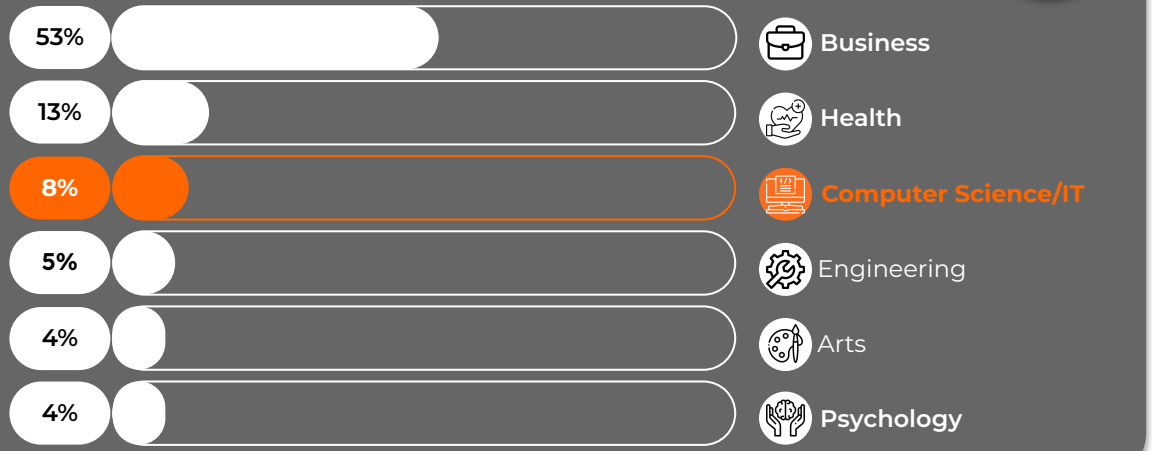
Source(s): Code.org and Liu et al.

8% of adult learners choose to enroll in Computer Science/IT programs

Adult learners are slightly less likely to be interested in Computer Science/IT programs than traditional undergraduates (8% and 11% respectively interested).

Share of Adult Learners by Major

Percent of Adult Undergraduate Learner profiles in the Lightcast database that pursued a program in a given field



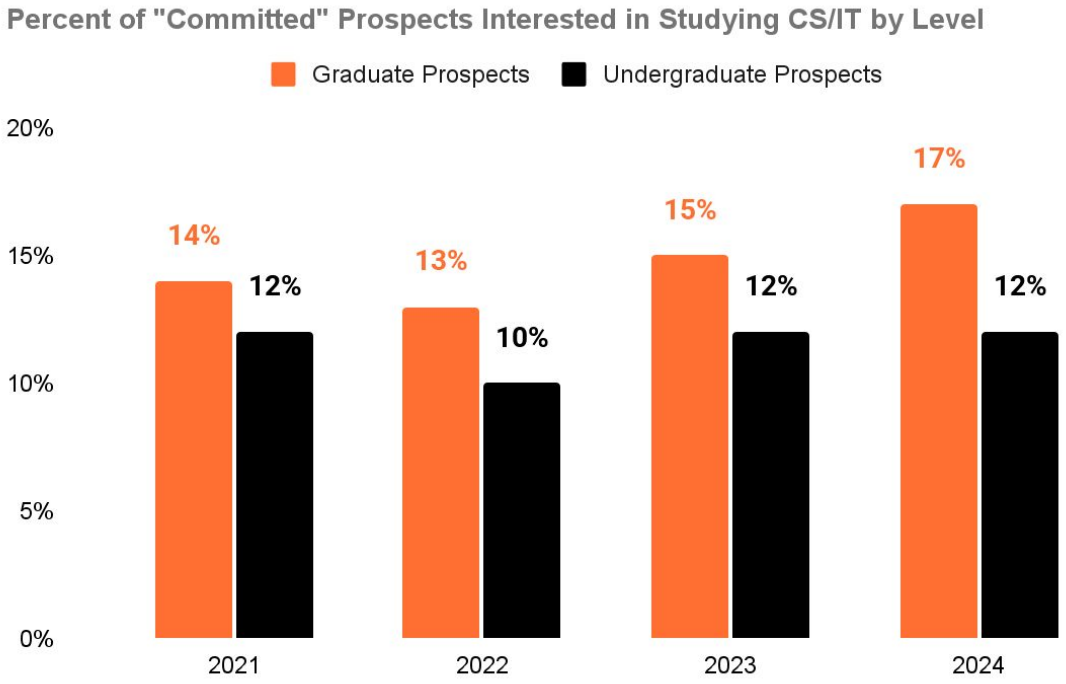
Source(s): Lightcast, data reflects adult learners that enrolled in a bachelor's program

Key Takeaways

- Adult learners are slightly less interested than traditional undergraduates in pursuing a program in the broad field of Computer Science/IT, with 8% ultimately enrolling in a program in these fields.
- Lightcast data also indicates that 8% of adult learners worked in the Information Technology industry prior to enrolling in a program (in any field).
- Note that this data specifically refers to adult learners at the undergraduate level, specifically the bachelor's level. For a more direct comparison to other sources in the report, Encoura reports that 9% of prospective adult learner undergraduate students are interested in studying Computer Science/IT as of 2024.

The share of “committed” graduate prospects interested in CS/IT is up

While the share of all prospective graduate students interested in CS/IT is declining, the share of “committed” prospects interested in the field is growing.



Source(s): Eduventures/Encoura

Key Takeaways

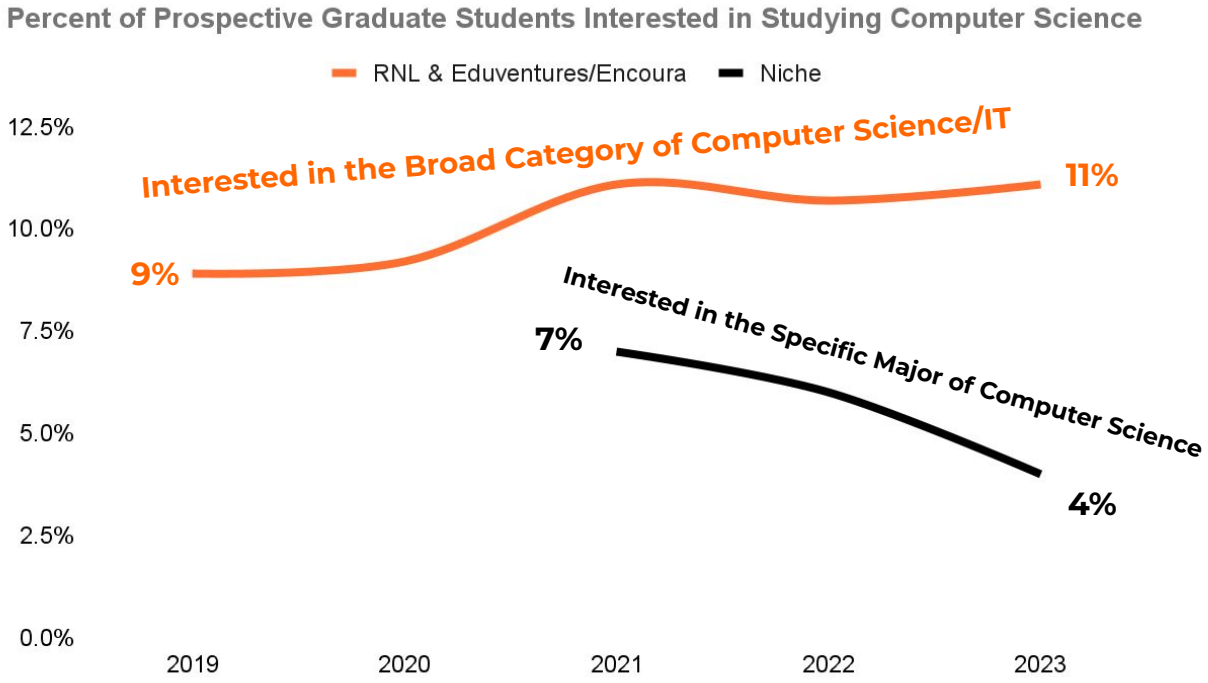
- From 2021 to 2023 the share of prospective graduate students indicating interest in pursuing a program in the broad field of Computer Science/IT fell from 12.0% to 11.0%. However, if only “committed” prospects are included in the analysis, the share of prospects interested in CS/IT grew from 14% in 2021 to 17% in 2024.
- At the undergraduate level, there was a brief dip in the share of “committed” prospects interested in studying CS/IT in 2022, however as of 2024, 12% of these prospects remain interested in pursuing a program in these fields - the same percentage as in 2021. This is 50% higher than the 8% of adult undergraduates who have historically enrolled in these programs.

STUDENT DEMAND

The share of graduate students interested in CS/IT is growing

From 2019 to 2023 the share of prospective graduate students interested in pursuing a program in the broad field of CS/IT grew from 9% to 11%.

Graduate Students



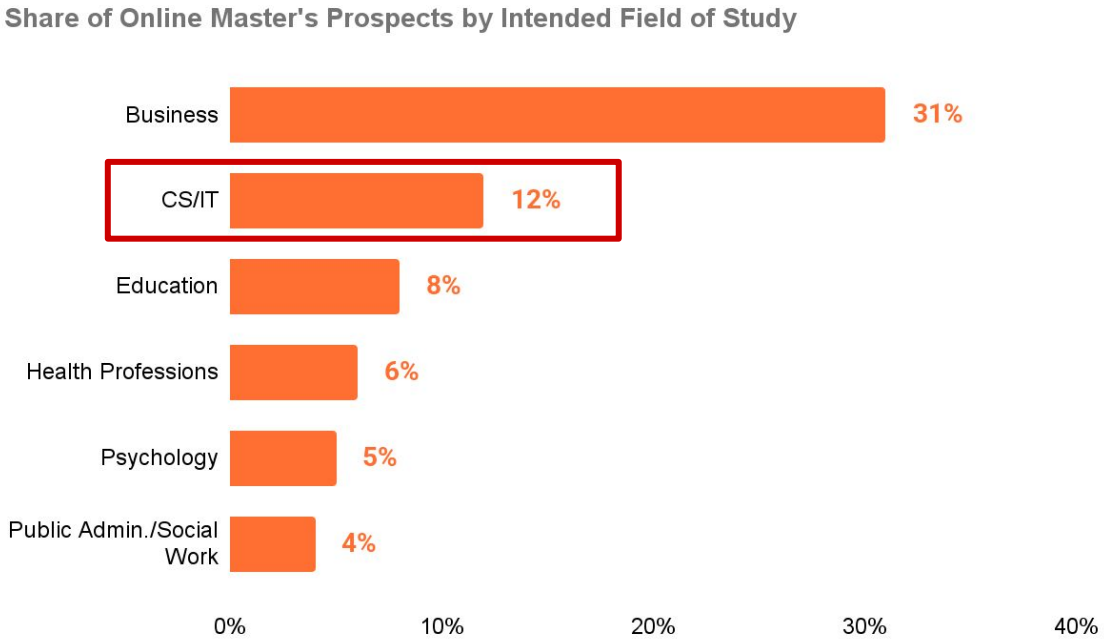
Key Takeaways

- From 2019 to 2023 the share of prospective graduate students indicating interest in pursuing a program in the broad field of Computer Science/IT grew from 9% to 12%.
- The share of prospective graduate students interested in the specific major of Computer Science dropped, however, falling from 7% in 2021 to 4% in 2023..
- Synthesizing the two data sources, we calculate that the share of prospective graduate students that are interested in a program in the broad category of Computer Science/IT *other than* Computer Science grew from 4% in 2021 to 7% in 2023.

Source(s): Eduventures/Encoura, Niche, Ruffalo Noel Levitz (RNL), 2022 data for RNL is imputed, Validated Insights analysis, Eduventures/Encoura data is specifically for master's degree prospective students

CS/IT is the 2nd most sought-after online master's degree

As of 2024, 12% of prospective online master's degree students intended to study a program in the field of Computer Science/IT.



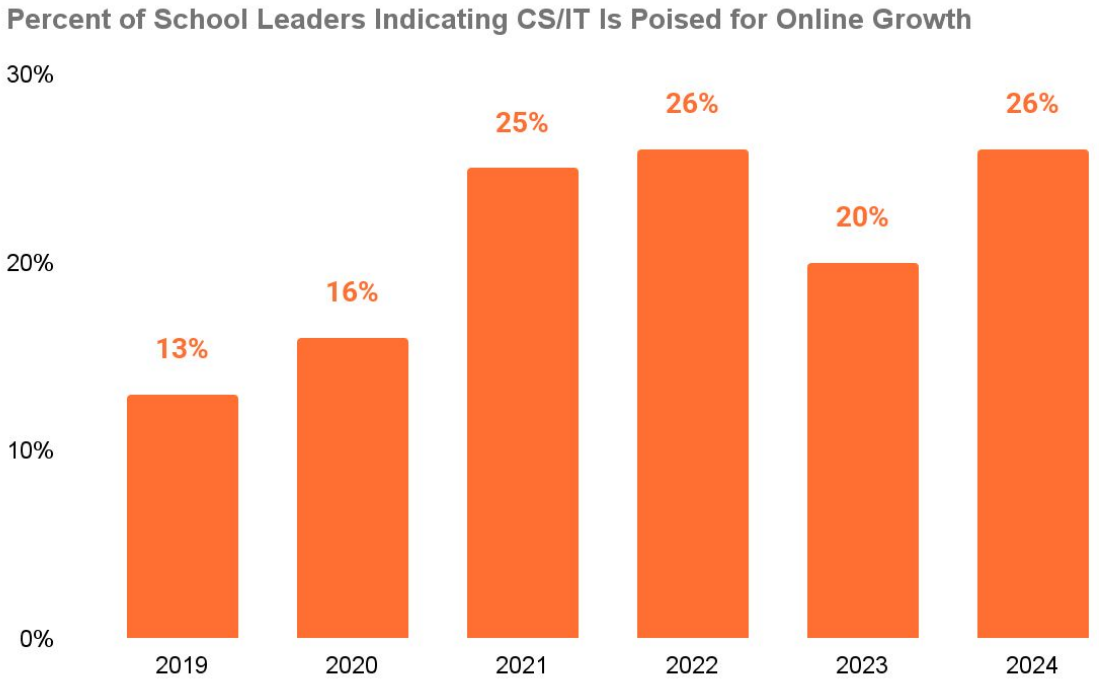
Key Takeaways

- While 11% of prospective graduate students, and 17% of "committed" prospective graduate students are interested in studying a program in the field of Computer Science/IT, 12% of prospective *online master's students* (specifically) are interested in pursuing a program in these fields. This means the share of the online master's degree market oriented towards Technology fields is disproportionately high, as 9.3% of all master's completions in 2023 were in these fields.
- Other research from UPCEA and Collegis Education identified that 13% of prospective adult and graduate learners previously earned a bachelor's degree in Computer Science or related fields.

Source(s): Eduventures/Encoura and UPCEA & Collegis Education

University leaders are increasingly confident in online CS/IT programs

From 2019 to 2024 the percentage of university leaders indicating the belief that CS/IT is poised for strong growth in online enrollment doubled.



Source(s): BestColleges

Key Takeaways

- In 2019 just 13% of university leaders indicated that they believed that CS/IT was a top field of study for online enrollment growth potential over the next five years.
- Between 2019 and 2024, the percentage of university leaders indicating belief in the online enrollment potential of CS/IT programs doubled from 13% to 26%.
- During this period, the share of online students enrolled in CS/IT programs grew from 10% to 12%, indicating that online CS/IT programs grew faster than all online programs during that period. Even as online enrollment in these programs flourished, university leaders are increasingly seeing these programs as an area of opportunity for enrollment growth.

The Computer Science/Information Technology Education Market

Labor Market Trends

CS/IT Labor Market Demand Trends

Employment in the Tech sector has grown faster than the aggregate labor market for decades, and that is projected to continue. The Bureau of Labor Statistics (BLS) estimates that there were 5.8 million people employed in Tech roles in 2023, and the employment in these roles would grow 13.1% from 2023 to 2033 (1.2% CAGR). CompTIA (with Lightcast) estimate that there were 6.0 million people employed in Tech roles in 2024, however they project employment to grow even faster than the BLS, projecting that this employment will grow 18.4% from 2024 to 2034 (1.7% CAGR). This comes after Tech employment grew at a 2.2% CAGR from 2001 to 2020. The Tech market represents about 8.9% of U.S. GDP in 2025, however the Tech workforce only represents 3.5% of employment. And while the Tech market is projected to grow to comprise 11.9% of the economy in 2030, Tech employment (in Tech occupations) is projected to grow to represent 3.8% of employment in 2034.

In recent months the Tech sector (and Tech occupations) have underperformed the aggregate market. Job postings for both Software Development roles and IT Operations & Helpdesk roles have underperformed all job postings since early 2023 and mid-2022 respectively. From April 2023 to April 2025 all active Tech (occupation) job postings declined 33.1%, however the past 12 months have seen improvement as active Tech job posting activity grew 9.4% from April 2024 to April 2025.

The trend of decline followed by slight improvement can also be observed in Tech layoffs. Tech layoffs surged in 2022 and peaked in 2023, with an estimated 430 thousand Tech workers (or 7.4% of the entire Tech workforce) being laid off that year. In 2024, however, Tech layoffs declined 44.4% year-over-year and in 2025 Tech layoffs are trending towards another 24.7% year-over-year decline.

The rise of Artificial Intelligence is changing demand for Software Developers, significantly reducing demand for entry-level employees in these roles. From 2023 to 2024, entry-level hiring (hiring of recent graduates) by Tech companies declined 25% year-over-year.

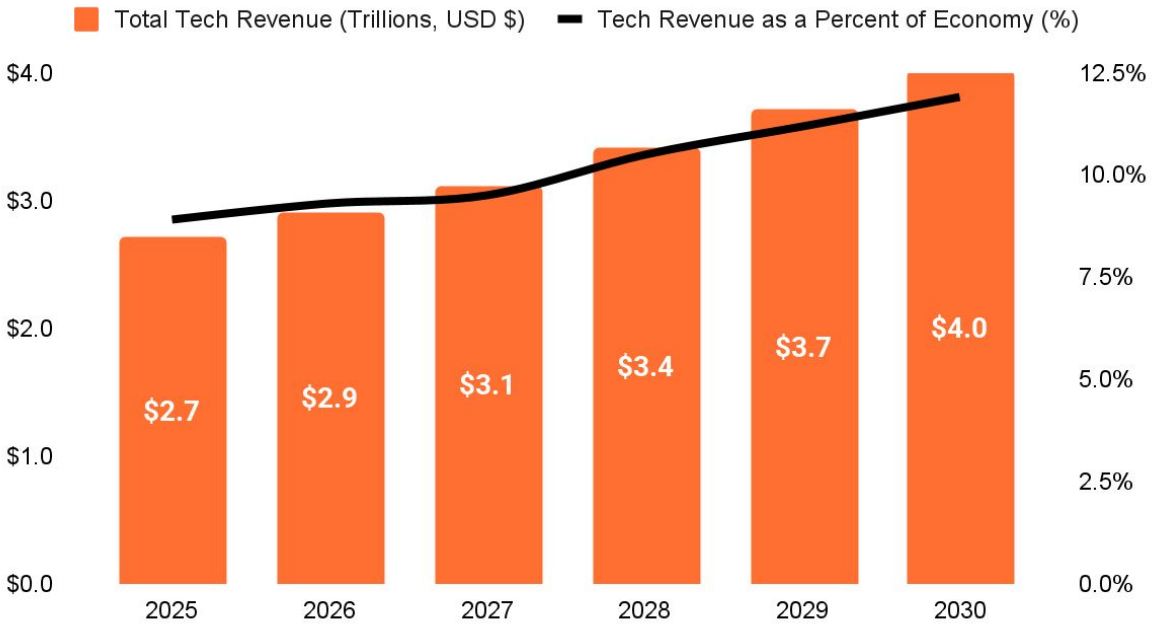
Outcomes remain relatively strong for graduates of Computer Science programs compared to other academic programs, however overall declines in entry-level hiring have affected the field as well. From 2018 to 2023 the share of recent BS in CS/IT graduates that were employed six months after graduation declined from 75.1% to 69.1% and from 2019 to 2024 the share of BS in Computer Science graduates from top programs that had gained employment specifically as a Software Engineer declined from 69% to 61%.

LABOR MARKET DEMAND

The Tech market will grow from 8.9% of the economy to 11.9%

From 2025 to 2030 the total Tech market in the United States is projected to grow at an 8.0% CAGR, growing to 11.9% of the total economy in 2030.

Projected Total Tech Market Size by Year



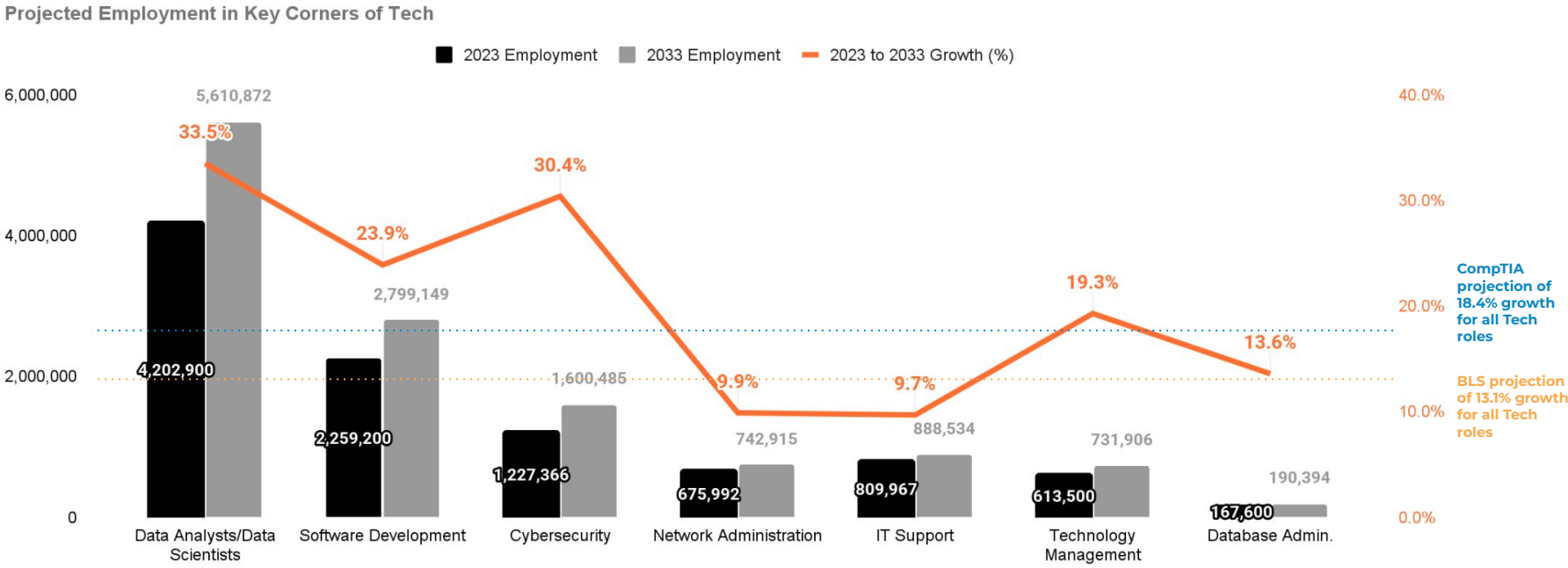
Source(s): Forrester, Research and Markets, and Statista Validated Insights analysis

Key Takeaways

- As of 2025 the Tech market in the United States is worth an estimated $2.7 Trillion, or 8.9% of the U.S. economy. In spite of this, the Tech workforce comprises only 3.5% of the aggregate workforce.
- From 2025 to 2030 the Tech market is projected to grow at an 8.0% CAGR to $4.0 Trillion, or 11.9% of the total U.S. economy. Even with Tech growing its share of the aggregate economy, Tech employment as a share of the total workforce is projected to grow only marginally to 3.8% in 2034 (only includes those employed in Tech occupations).

CS/IT talent supply in the labor market is growing

Many of the occupations that saw the most growth in talent supply over the past five years are related to Computer Science/Information Technology.



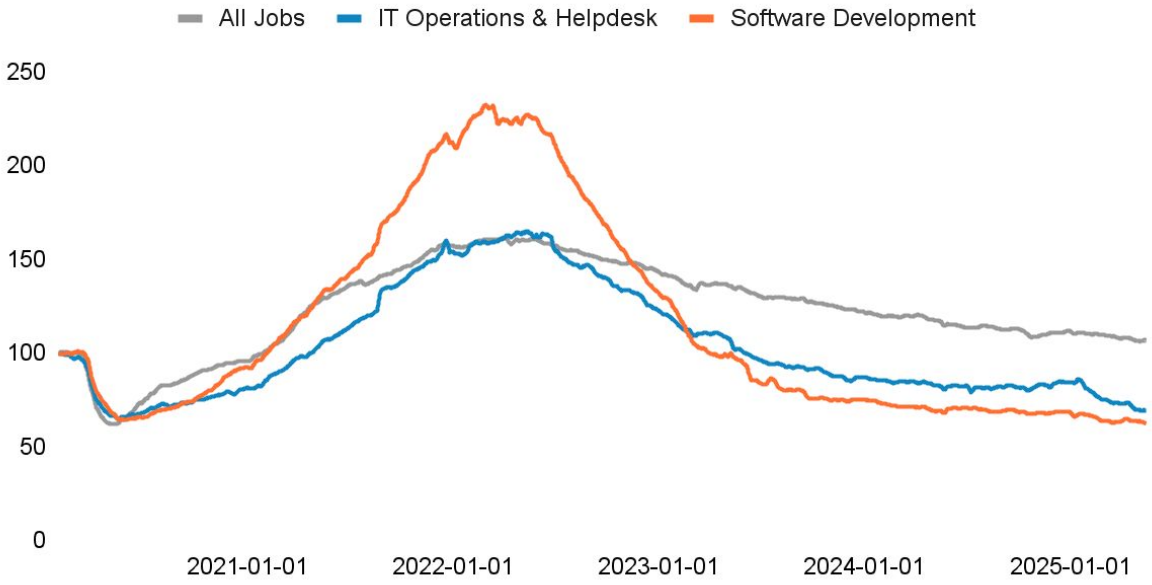
Source(s): AIM Research, CompTIA, Cyberseek, and the U.S. Bureau of Labor Statistics (BLS), Validated Insights analysis, note that Data Analysts/Data Scientists includes Data Analyst positions typically defined outside of Tech, employment growth is either 2023 to 2033 growth from the BLS or 2024 to 2034 growth from CompTIA

CS/IT job posting activity is underperforming the broader market

As of May 16, 2025, the job posting index for IT Operations & Helpdesk roles sat at 69.21, the index for Software Development roles sat at 61.85.

Indexed Job Posting Activity for IT Jobs, Software Jobs, and All Jobs

Indexed to 100 on February 1, 2020



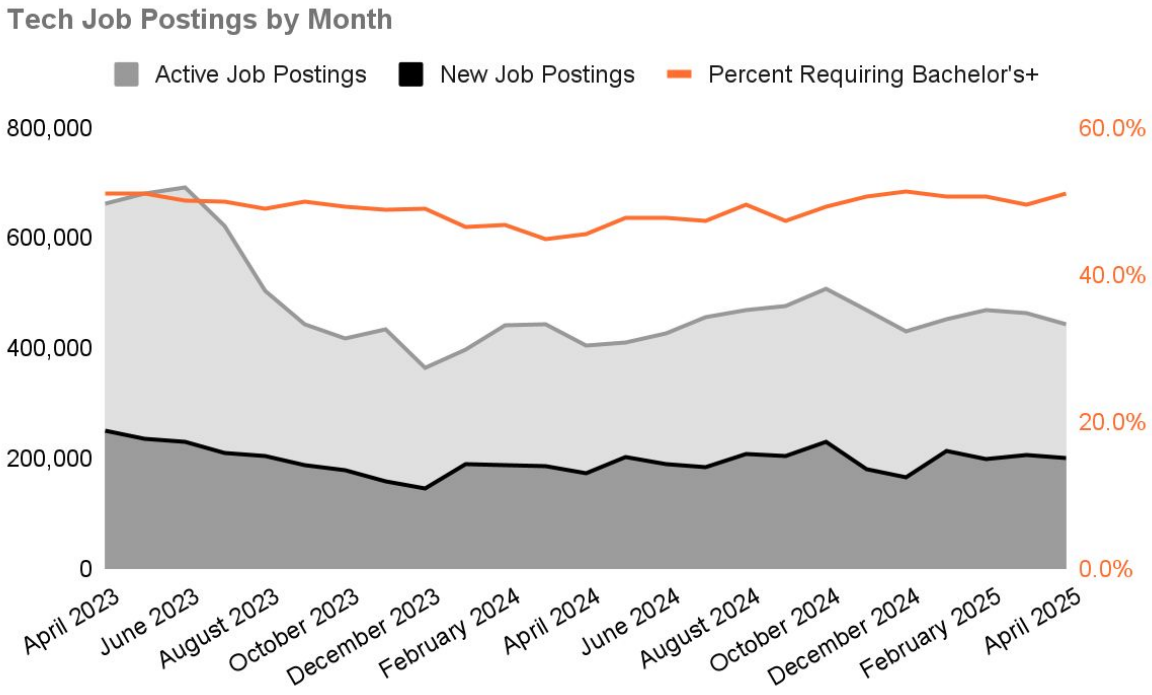
Source(s): Indeed

Key Takeaways

- As of May 16, 2025, the job posting index for IT Operations & Helpdesk roles sat at 69.21, the index for Software Development roles sat at just 61.85, and the index for all job postings sat at 106.56. This means that all job posting activity is up from Pre-pandemic levels, while job posting activity for CS/IT roles is down from those levels.
- Both IT Operations & Helpdesk and Software Development job postings peaked in early 2022.

Tech job postings have improved over the past year

After declining 38.9% from April 2023 to April 2024, Tech job postings grew 9.4% from April 2024 to April 2025.



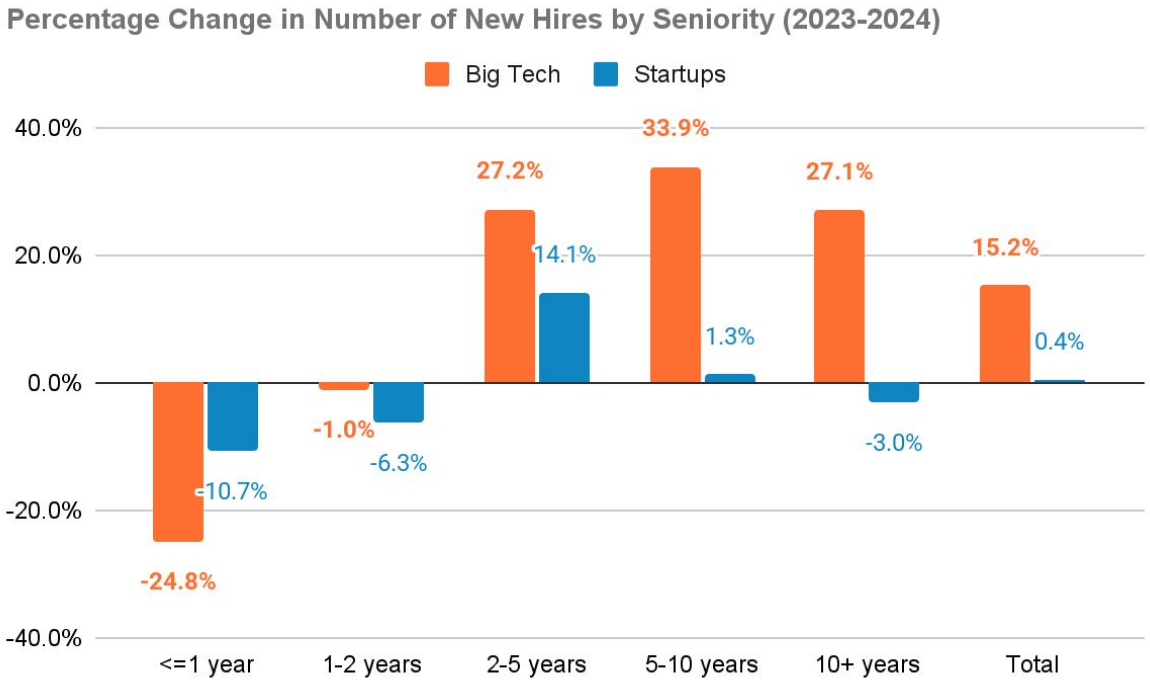
Source(s): CompTIA

Key Takeaways

- From April 2023 to April 2025, total active Tech job postings declined 33.1%. There has been a recent turnaround, however. From April 2023 to April 2024 these postings declined 38.9%, then from April 2024 to April 2025 these postings grew 9.4%. Also over the past year, new Tech job postings grew 15.5%.
- The percent of Tech job postings requiring at least a bachelor's degree has remained essentially unchanged over the past two years (51.1% in April 2023 and 51.0% in April 2025). With the overall decline in Tech job postings however, the number of Tech job postings requiring at least a bachelor's degree declined 33.3% over the past two years, but grew 22.3% over the past year (April 2024 to April 2025).

Entry-level CS/IT hiring dipped in 2024

Entry-level tech hiring declined 25% year-over-year in 2024 in spite of the broader market recovery.



Key Takeaways

- Tech companies are hiring fewer and fewer recent college graduates. The share of new hires at Tech companies that had one year or less of experience declined 50% from 2019 to 2024.
- Even among top Computer Science programs, outcomes are slipping. From 2019 to 2024 the share of graduates from top Computer Science programs that gained employment as an engineer within six months after graduation declined from 68% to 61%.

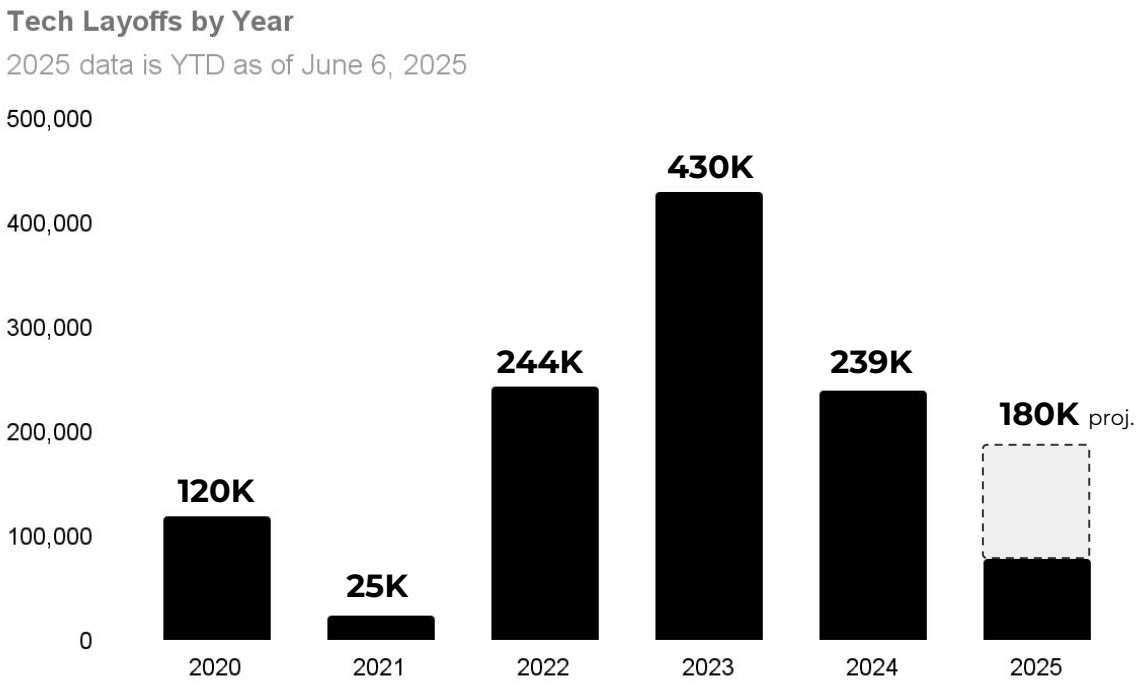
Y

"A quarter of startups in YC's current cohort have codebases that are almost entirely AI generated."
-TechCrunch

Source(s): SignalFire

Over 1.1 million Tech workers have been laid off since 2020

It appears that Tech layoffs are receding and there are projected to be 180 thousand workers laid off in 2025, down 24.7% from 2024.



Key Takeaways

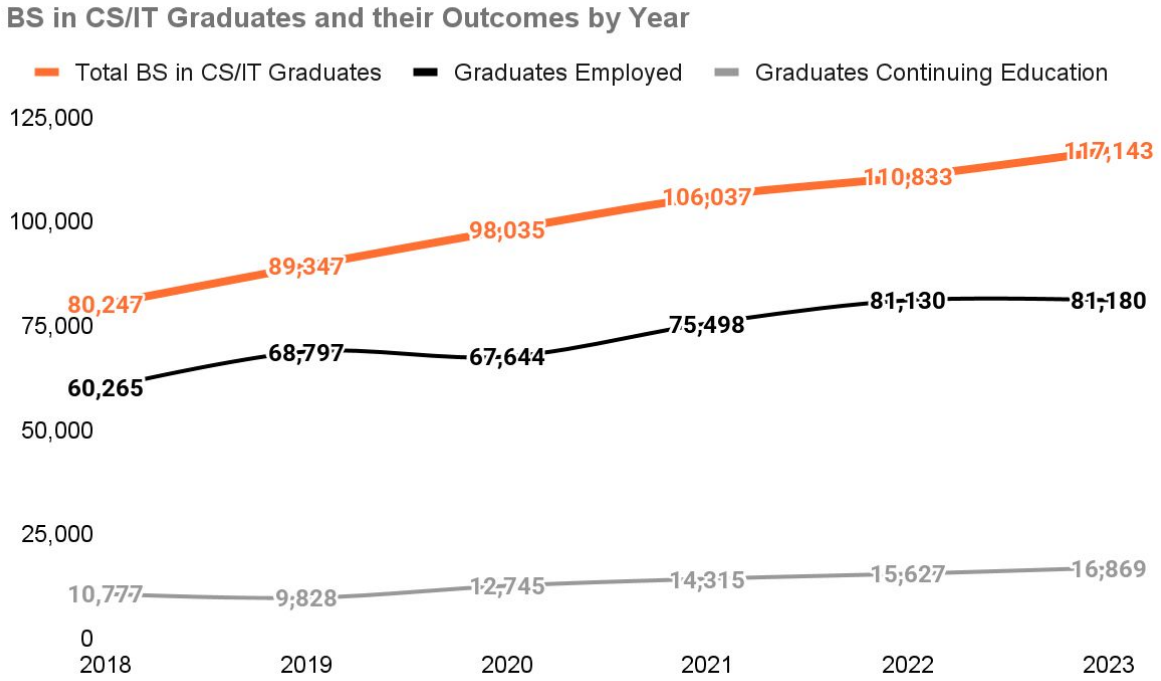
- Tech layoffs peaked in 2023 at 430,000 which represented 7.4% of all Tech workers that year.
- Year-to-date in 2025 there have been 78,000 Tech workers laid off, and there are now projected to be 180,000 total Tech layoffs this year which is a 24.7% decline from 2024 and 58.1% decline from the 2023 peak.
- While layoffs at Tech companies grew almost 10X from 2021 to 2024 (25,000 to 239,000), all layoffs across the country grew 18.5%, from 17.0 million to 20.2 million.

Source(s): TrueUp

LABOR MARKET DEMAND

BS in CS/IT graduates are seeing worsening outcomes

From 2018 to 2023 the percentage of recent BS in CS/IT graduates that gained employment within six months declined from 75.1% to 69.3%.



BS in CS/IT completions grew at a 7.9% CAGR from 2018 to 2023.

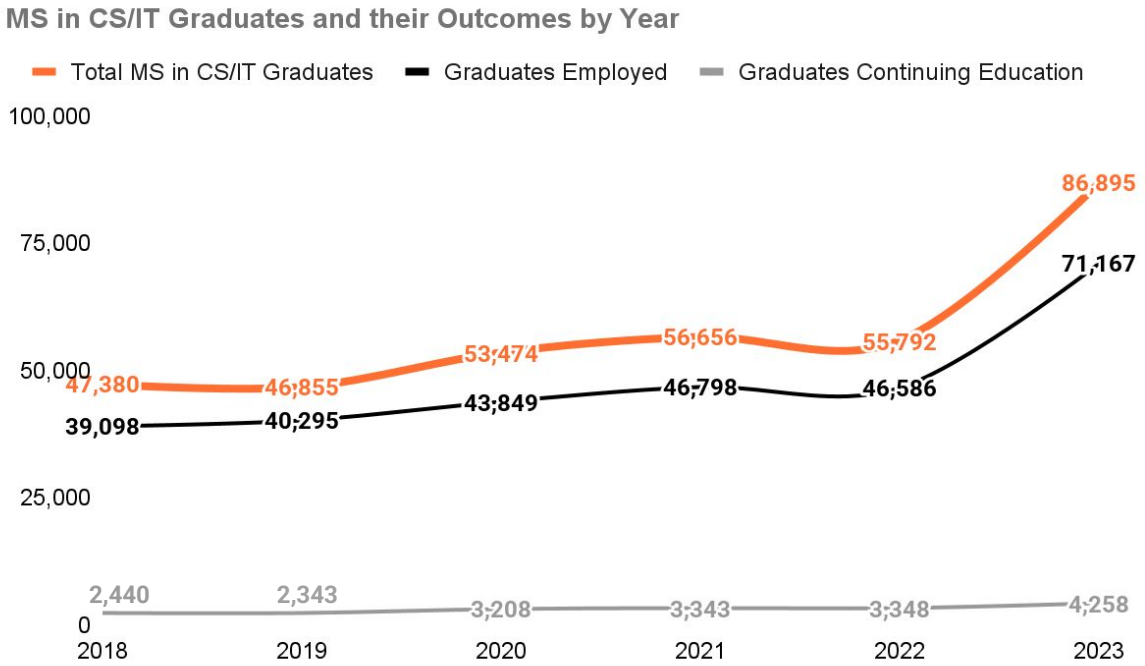
From 2018 to 2023 the percentage of recent graduates of BS in CS/IT programs that were employed within six months declined from 75.1% to 69.3%.

From 2018 to 2023 the number of recent BS in CS/IT graduates that immediately went on to continue their education grew at a 9.4% CAGR.

Source(s): National Association of Colleges and Employers (NACE) and National Center for Education Statistics (NCES) IPEDS, Validated Insights analysis

BS in CS/IT graduates are seeing worsening outcomes

From 2018 to 2023 the percentage of recent BS in CS/IT graduates that gained employment within six months declined from 75.1% to 69.3%.



MS in CS/IT completions grew at a 12.9% CAGR from 2018 to 2023.

From 2018 to 2023 the percentage of recent graduates of MS in CS/IT programs that were employed within six months declined from 82.5% to 81.9%.

From 2018 to 2023 the number of recent MS in CS/IT graduates that immediately went on to continue their education grew at an 11.8% CAGR.

Source(s): National Association of Colleges and Employers (NACE) and National Center for Education Statistics (NCES) IPEDS, Validated Insights analysis

The Computer Science/Information Technology Education Market

Artificial Intelligence/Machine Learning (AI/ML)

“Students of All Ages Returning to College for AI”

government technology

AI/ML Demand Trends

Demand for AI/ML skills is growing on both ends. On the one side, the growing adoption of Artificial Intelligence is driving demand for skilled talent needed to design, construct, and deliver tools and services related to this technology. On the other hand, as Artificial Intelligence adoption increases, it also drives demand for workers throughout the workforce that are able to utilize these technologies.

While it is difficult to quantify the precise size of the AI/ML workforce, it is estimated that there were about 375,000 technical professionals working in and around AI in 2024, and that there were specifically only 24,000 AI/ML Engineers. Employment of AI/ML Engineers is projected to grow rapidly, in fact, this employment is projected to grow 100X faster than the growth projected for all occupations. Employment of these highly specialized professionals is projected to grow at a 40.0% CAGR, while employment in the more broad field of technical professionals working in and around AI is projected to grow at about a 17.8% CAGR to about 1 million in 2030.

Owing to the growing labor market demand, enrollment in AI programs is expanding, yet volume is still a concern. From 2018 to 2023 enrollment in all Artificial Intelligence programs (across all award levels) grew at a 44.8% CAGR.

However, as of Fall 2023, there were estimated to only have been 3,809 students enrolled in these programs. Also as of 2023, 77.7% of all Artificial Intelligence completions were at the master's degree level, and Master's in AI/ML completions grew at a 35% CAGR over the previous five years. The most remarkable growth was observed in graduate certificates in the field, where completions grew at a 245% CAGR, however only 10.9% of completions in AI/ML in 2023 were in these programs.

There is ample evidence that prospective students are looking to other AI/ML certificate programs that aren't being captured by NCES IPEDS, however, particularly when it comes to Generative AI. For example, ChatGPT launched in November of 2022, and by January of 2024, almost 3.5 million people had taken Generative AI courses on either the Coursera or Udemy platforms.

This growing demand for Generative AI upskilling is driven by the fact that approximately 2% of the workforce now uses AI at work, and approximately 2% of job postings call for the ability to do so. Accordingly, 83% of students in North America now indicate that Generative AI should be a part of any degree program.

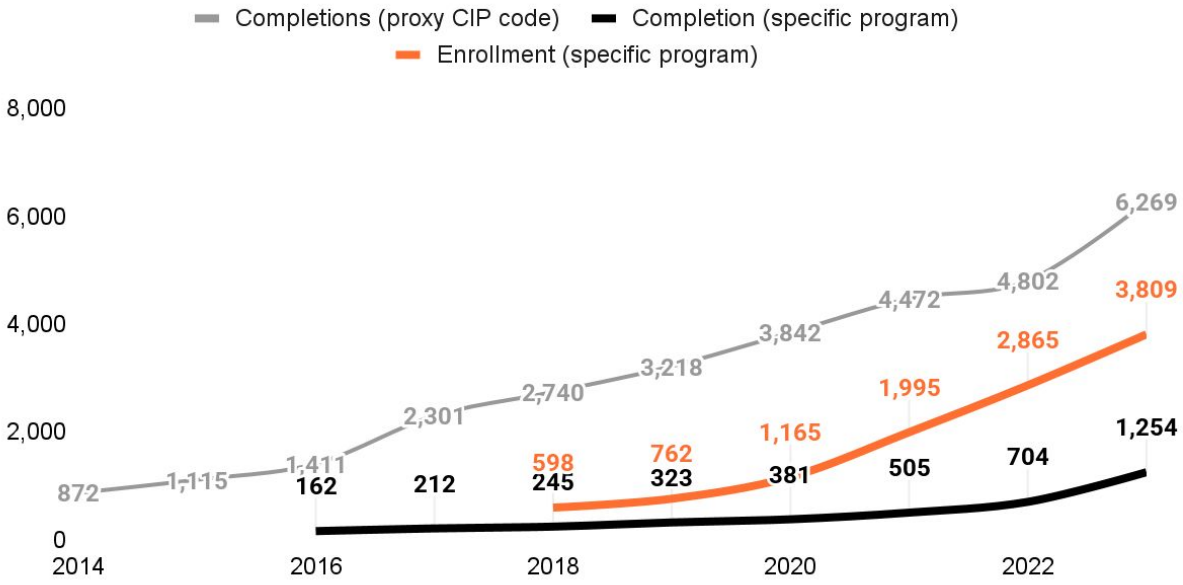
STUDENT DEMAND

Enrollment in AI/ML programs is growing

From Fall 2018 to Fall 2023 enrollment in AI/ML programs across all award levels grew at a 44.8% CAGR, b

Total Artificial Intelligence Completions and Fall Enrollment by Year

Includes all award levels



Key Takeaways

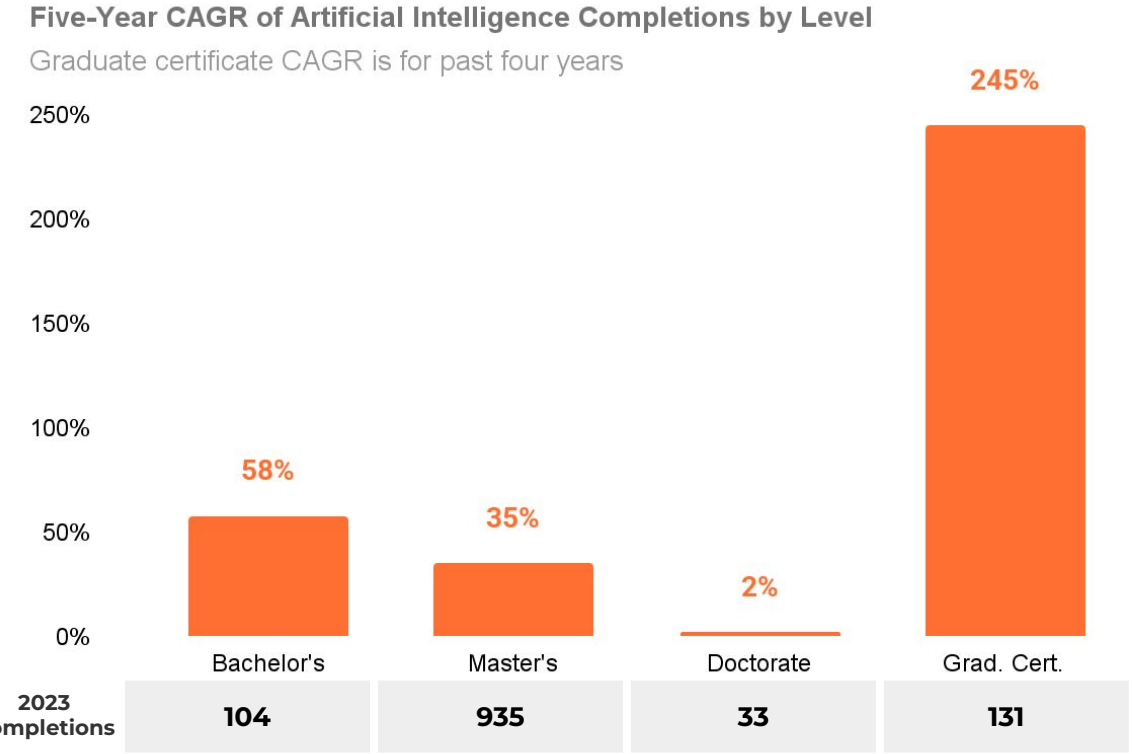
- From Fall 2018 to Fall 2023 enrollment in AI/ML programs across all program levels grew at a 44.8% CAGR from 598 to 3,809.
- Encoura reports that, using a proxy CIP code, completions of AI/ML programs grew at a 24.5% CAGR from 2014 to 2023. Looking at AI/ML more specifically, as opposed to using the proxy CIP code, Gray Decision Intelligence reports that all AI/ML completions grew at a 25.5% CAGR from 2016 to 2021, during which time Encoura reported that completions grew at a 25.9% CAGR using the proxy CIP code. The volume of completions looking at the specific program with Gray Decision Intelligence data is 11.3% of the completion volume reported by Encoura using the proxy CIP code.

Source(s): Eduventures/Encoura, Gray Decision Intelligence with National Student Clearinghouse (NSC) Research Center, and National Center for Education Statistics (NCES) IPEDS

STUDENT DEMAND

AI/ML completions are growing, particularly certificate programs

Over the past four years, Certificate of AI/ML completions grew at a 245% CAGR.



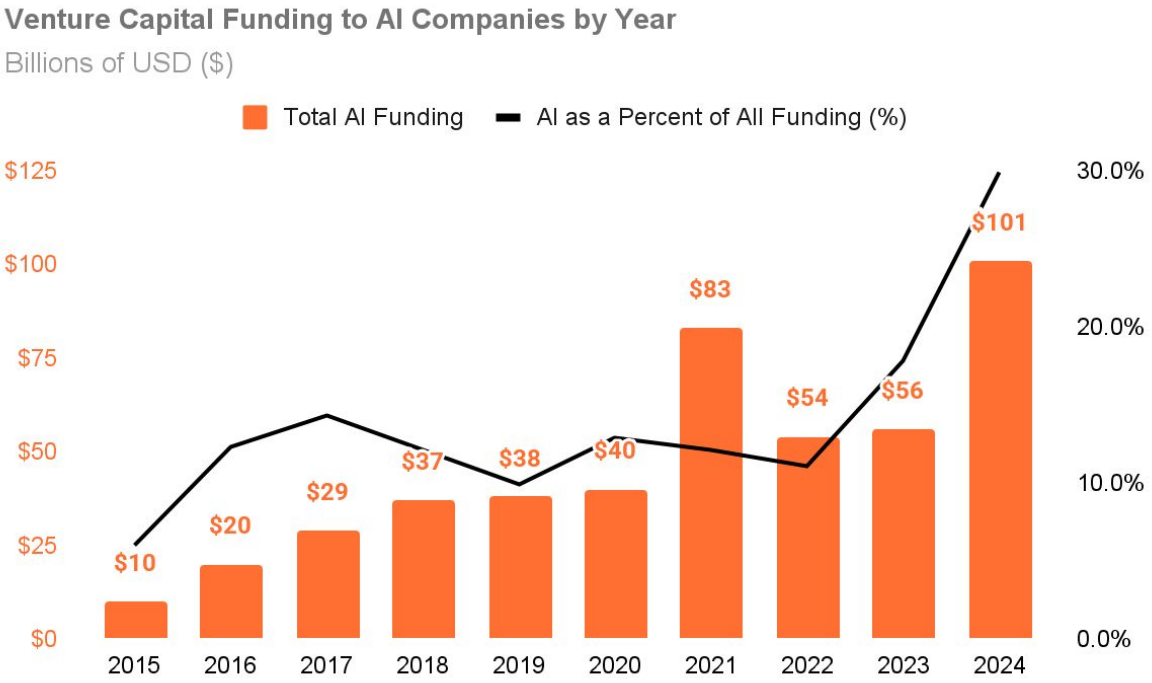
Key Takeaways

- While the most common level of education for AI/ML is the master's degree, with 935 completions reported in 2023, faster growth is being observed at both the bachelor's degree level and at the graduate certificate level. Even though the MS in AI/ML lagged behind other program levels in terms of completion growth, the program still saw completions grow rapidly, at a CAGR of 35% over the past five years.
- Over the past four years, completions of graduate certificates in AI/ML grew at an astonishing 245% CAGR, and BS in AI/ML completions grew at a very high 58% CAGR over the past five years.

Source(s): Gray Decision Intelligence with National Student Clearinghouse (NSC) Research Center and National Center for Education Statistics (NCES) IPEDS

AI investment has rebounded as is back on a growth trajectory

Venture capital funding to AI companies grew 80.4% in 2024 to $101B, the largest year on record. From 2015 to 2024 this funding grew at a 29.3% CAGR.



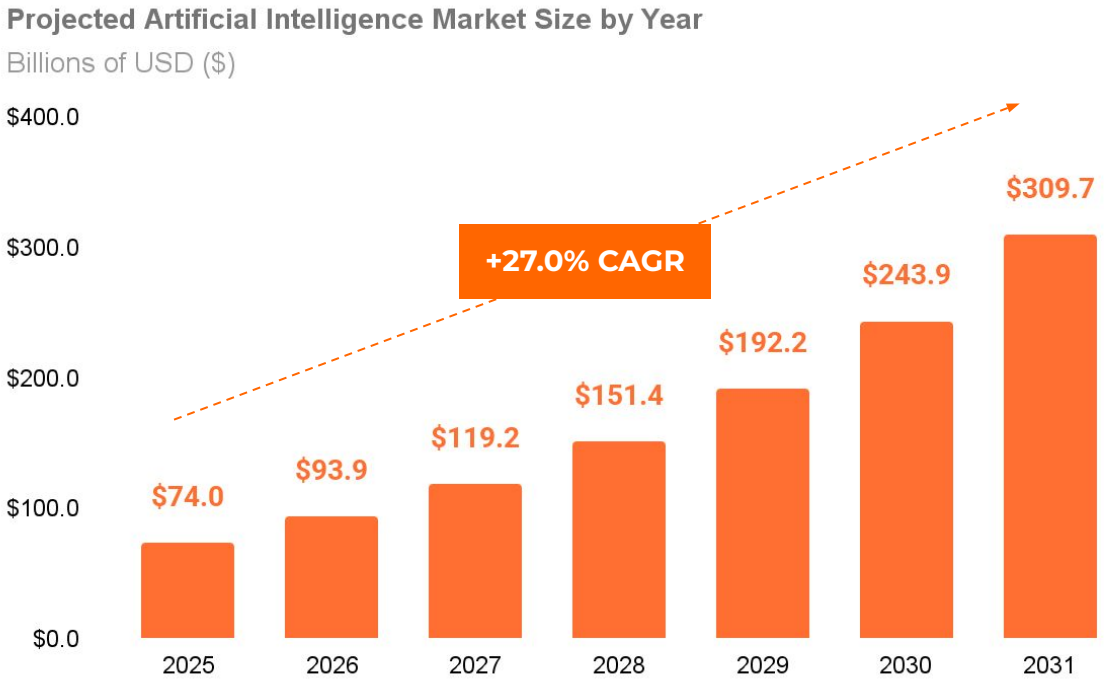
Source(s): Crunchbase and Dealroom

Key Takeaways

- From 2015 to 2024 total venture capital funding to Artificial Intelligence companies grew at a 29.3% CAGR to $101B. In 2024 alone this funding grew 80.4%, and 2024 was the largest year on record for this funding.
- In 2015 just 6.0% of all venture capital funding went to Artificial Intelligence companies. In 2024, AI's share of total funding had grown to 29.9%.
- This venture capital investment is anticipated to spur continued employment growth of AI professionals, as VC-backed companies have shown to see employment grow 8X faster than non-VC-backed companies (National Venture Capital Association).

The AI market is projected to grow at a 27.0% CAGR

From 2025 to 2031 the Artificial Intelligence market in the United States is projected to grow at a 27.0% CAGR from $74.0B to $309.7B.



Source(s): Statista

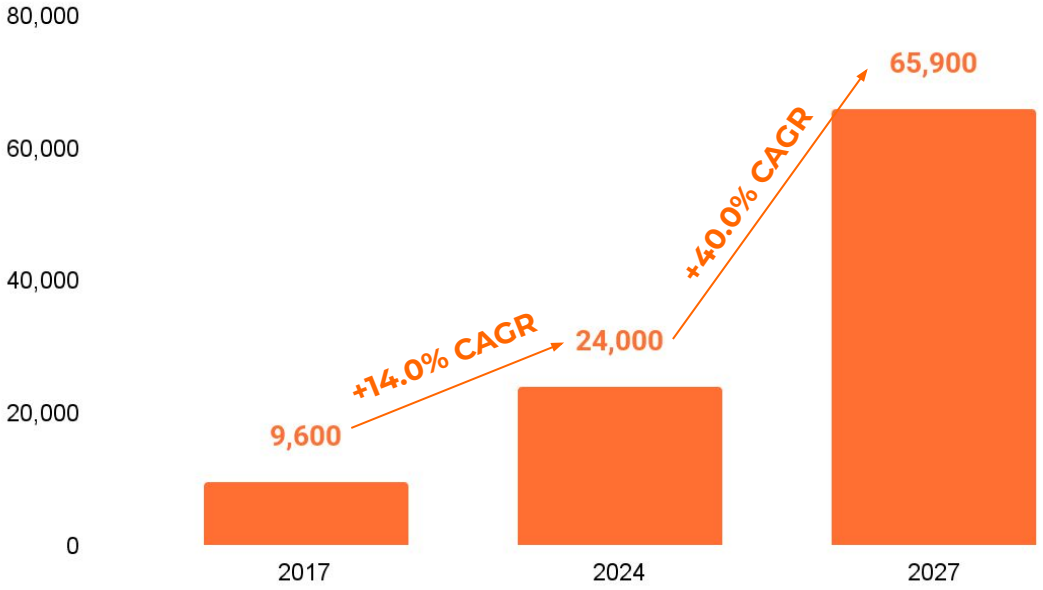
Key Takeaways

- As of 2025 the total Artificial Intelligence market in the United States is estimated to be worth $74.0B, or 2.7% of the aggregate Tech market (of $2.7T).
- From 2025 to 2031 the Artificial Intelligence market is projected to grow at a 27.0% CAGR, while the aggregate Tech market is projected to grow at only about an 8.0% CAGR, meaning that by 2031, Artificial Intelligence will represent 4.3% of the total Tech market (or $309.7B).

AI/ML Engineer employment will almost triple from 2024 to 2027

From 2024 to 2027 employment of AI/ML Engineers is projected to grow at a 40.0% CAGR, or 100X faster than the average for all occupations.

Estimated and Projected Employment of AI/ML Engineers/Developers in the United States



Source(s): AIM Research, BytePlus, Interview Query, Tencent, data assumes that the percentage of AI/ML Engineers that reside in the United States in 2024 was the same as in 2017, Validated Insights analysis

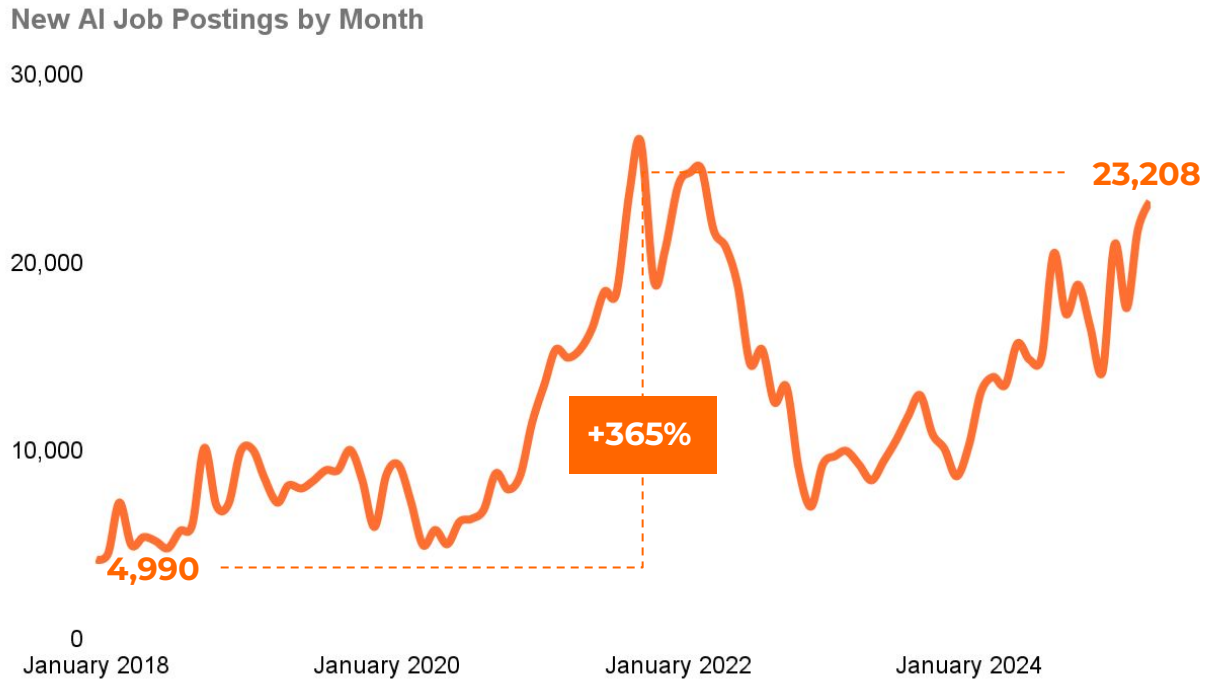
Key Takeaways

- As of 2024, there are estimated to be only 24,000 AI/ML Engineers in the United States. This represents only 0.4% of the total Tech workforce in the United States. Employment of AI/ML Engineers is projected to grow rapidly in the coming years, with a projected employment CAGR of 40.0% from 2024 to 2029 (which is 100X faster than the projected growth of all occupations between 2023 and 2033). This is a significant acceleration from the 14.0% CAGR estimated for the 2017 to 2024 time frame.
- While there are estimated to only have been about 24,000 AI/ML Engineers in 2024, the total technical workforce in the field of (or adjacent to AI) was estimated to have been about 375,000. Assuming the share of total employment in the U.S. remains constant, this pool of employment is projected to grow at about a 17.8% CAGR to 2030.

LABOR MARKET DEMAND

AI job postings grew 365% from April 2018 to April 2025

New job postings for AI roles grew 365% from April 2018 to April 2025 (24.6% CAGR). AI/ML Engineers represent 4.3% of AI job postings.



Source(s): Lightcast and UMD-LinkUP AI Maps

Key Takeaways

- In April of 2018 there were 4,990 job postings for AI roles. By April of 2025 that number had grown 365% to 23,208. Also during this period, the number of *active* job postings for AI roles grew 341%, from 12,709 to 56,090.
- From Q1 of 2024 to Q1 of 2025, new job postings for AI roles grew 61.8%
- As of April 2025, 24% of all IT job postings call for some degree of AI skills, up from just 6% in April 2018..
- From June 2024 to April 2025 job postings for AI/ML Engineers grew 115.4%, from 1,120 to 2,412. As of April 2025 there were 55,746 total *active* AI job postings (up 43.8% from June 2024). This means that while highly specialized talent comprises 4.3% of AI hiring demand.

Generative AI

How AI is reshaping demand for education and training beyond AI/ML development

The Impact of AI on Other Fields

As AI adoption takes hold, education and training providers (including colleges and universities) have adopted two primary strategies.

One - Colleges and Universities are incorporating AI into their standard curriculum across all programs.

This strategy primarily focuses on preparing the workforce of *tomorrow* with the skills they will need. And there is ample demand for these initiatives. For example:

- 83% of college students in North America indicated that they believe Generative AI should be incorporated into the curriculum of degree programs (Coursera).
- 70% of recent college graduates report that they believe that Generative AI should be incorporated into coursework (Cengage Group).
- Employers also are also highlighting the importance of training students to use Generative AI tools, as employers report a willing to pay a salary premium of between 35-47% for an employee with AI skills over one without them (depending on the department in which they are hired) (AWS).
- 88% of employers think colleges and universities should provide educational opportunities for students to learn about AI and its practical uses (SHRM).

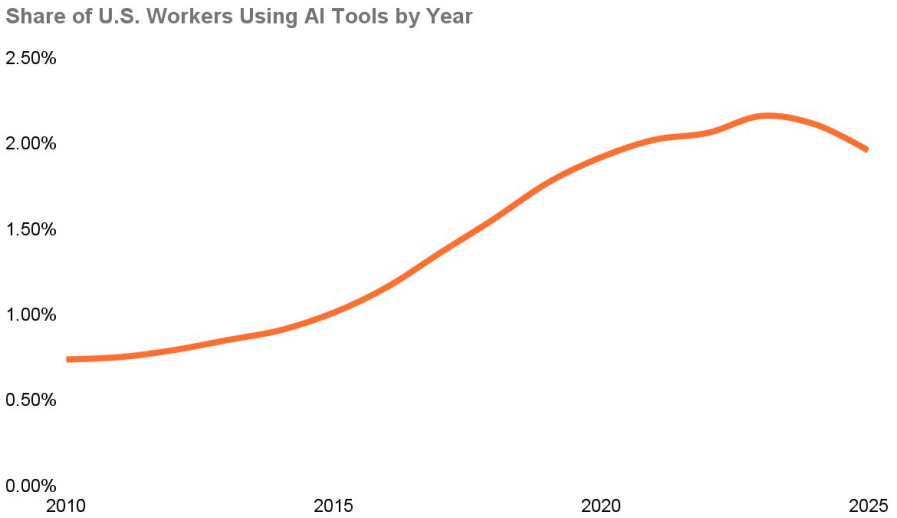
Schools have largely been ineffective to date with these initiatives, with the exception of business schools.

- 55% of recent graduates said their recently completed program did not provide them with the preparation they need to use Generative AI at work (Cengage Group).
- In a global survey of prospective MBA students, 43% indicated interest in studying AI as part of their program, the most sought-after Tech subject in the survey (CarringtonCrisp). 41% of prospective business school students surveyed by GMAC went so far as to say that Artificial Intelligence is a curricular “must have” (GMAC).
    - Following this demand, 78% of Business Schools now incorporate Artificial Intelligence in their curriculum (GMAC).

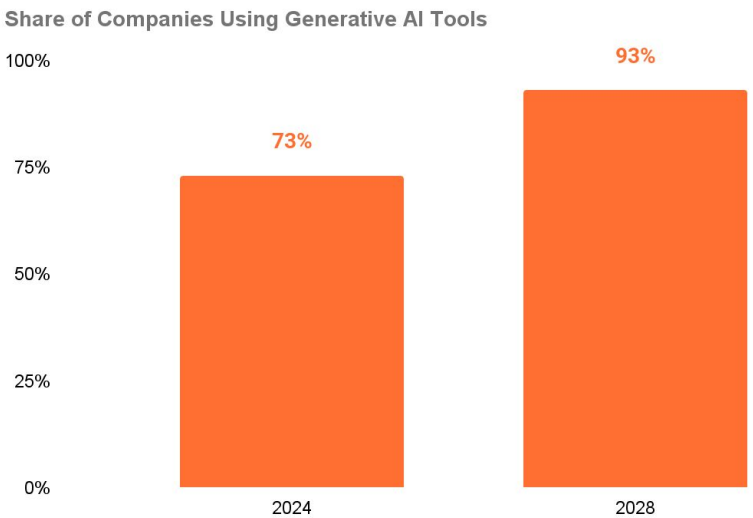
AI adoption is growing, and a larger share of the workforce is using AI

From 2024 to 2028 the share of companies using AI is projected to grow from 73% to 93%. Even though 73% were using these tools in 2024, only about 2% of workers were.

The share of workers using AI tools at work has risen steadily, growing from just 0.74% of workers in 2010 to 1.96% of workers in 2025.



As of 2024 73% of companies were utilizing Generative AI. By 2028, however, 93% of companies anticipate doing so.



Source(s): For chart on the left: Revelio Labs, For chart on the right: AWS and the Cengage Group

The Impact of AI on Other Fields

As AI adoption takes hold, education and training providers (including colleges and universities) have adopted two primary strategies.

Two - Colleges and Universities, as well as other education and training providers, are rolling out stand-alone microcredentials in Generative AI.

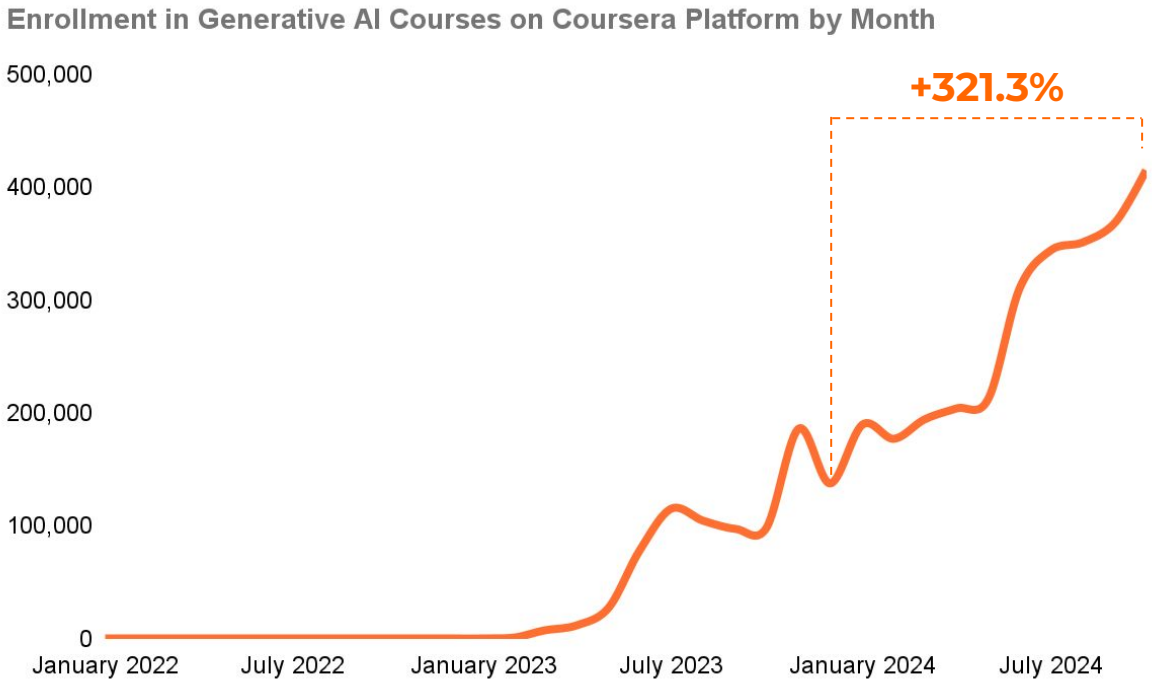
This strategy primarily focuses on upskilling the *current* workforce with the skills they need to adapt and use the new technologies that are now available. There is ample demand for these programs, for example:

- 14 months after the launch of GhatGPT, nearly 3.5 million people had taken Generative AI courses on either the Coursera or Udemy platform.
- 69% of entry-level employees globally report being interested in obtaining a microcredential in Generative AI (Coursera).
- 80% of workers indicate that they are interested in upskilling in the domain of Artificial Intelligence (56.8 million people), 66% indicate that they are planning to pursue education or training in the next six months to do just that (46.9 million people), yet only 4% are currently pursuing education and training in Artificial Intelligence (28.4 million) (AWS and edX).

STUDENT DEMAND

Enrollment in Generative AI coursework is exploding

ChatGPT launched in November 2022. By January 2024 almost 3.5 million students had taken Generative AI courses with either Coursera or Udemy.



Key Takeaways

- Coursera first launched Generative AI coursework in February of 2023. By July of 2023 these courses had already reached 100,000 current enrollments, and by December of 2024 these courses had already enrolled more than 4 million students total.
- Udemy first launched Generative AI coursework in November of 2022. By January of 2024 these courses had already eclipsed 2.4 million total enrollments.
- Great Learning reported that Generative AI courses on the platform saw enrollment grow 2.6X from November 2023 to February 2024.

Source(s): World Economic Forum (WEF) with Coursera

The Computer Science/Information Technology Education Market

Computer Science (CS)

“Universities Can’t Accommodate All the Computer Science Majors”

Inside Higher Ed

Computer Science Demand Trends

Computer Science has been rising in the ranks of most popular fields of study at both the bachelor's and master's degree levels. From Fall 2019 to Fall 2024, enrollment in BS in Computer Science programs grew at a 4.9% CAGR and enrollment in MS in Computer Science programs grew at a 10.1% CAGR. As of Fall 2024 the BS in Computer Science sat as the 5th largest bachelor's degree subject, behind only Business Administration, General Studies, Nursing, and Psychology; and the MS in Computer Science also sat as the 5th largest master's degree subject, behind only the MBA, the Master of Business Analytics, the MSW, and the MSN.

New enrollment and completions of these programs are also growing, particularly at the master's degree level where completions grew at a 12.0% CAGR and new enrollments grew at a 14.3% CAGR. At the bachelor's level there are some indications that a slowdown is imminent as completions are seeing decelerating growth and new enrollment actually declined year-over-year in Fall 2024. In addition, search traffic for keywords related to BS and MS in Computer Science programs (combined) grew at a 14.2% CAGR from 2021 to 2024. This occurred while traffic for the bachelor's and master's degree programs in the field has been rising, search traffic for Computer Science (education) related keywords in the aggregate have declined, falling at a -0.2% CAGR from 2021 to 2024.

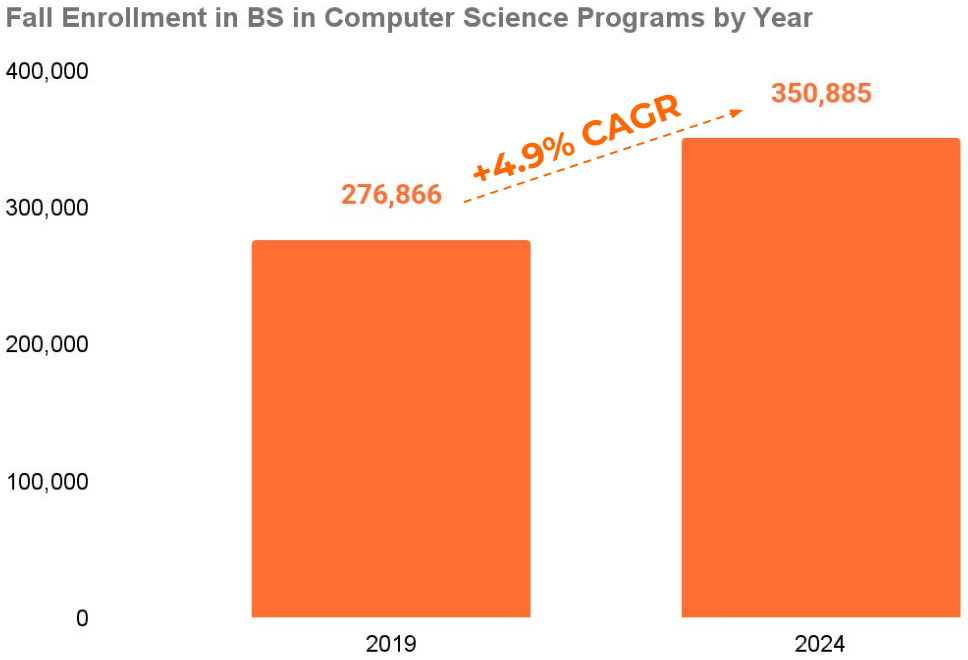
The growing demand for Computer Science degrees has been reflected in news coverage where it has been noted that many institutions have seen such an influx of students that they've had to limit enrollment in the program. Not all of the recent media coverage has been positive, however, as a recent Newsweek article covered a recent report by the Federal Reserve Bank of New York that noted that recent graduates of bachelor's degrees in Computer Science (broadly defined) had an abnormally high unemployment rate of 6.1% in 2023, ranking between Sociology (6.7%) and Liberal Arts (5.3%). Much of this may be attributed to the decline in employment of Software Developers, as 31% of Computer Science degree-holders work in these roles.

The recent labor market troubles are also reflected in the post-graduation hiring outcomes data, where the percentage of BS in Computer Science graduates who had obtained employment within six months following graduation had declined from 78% in 2019 to 68% in 2023. During that same time, the average starting salary of these newly employed graduates grew slower than aggregate average wage growth. Nevertheless, demand for these graduates is still high relative to other higher education graduates, as "Computer Science" is the fourth most requested skill in job postings that require at least a bachelor's degree, behind on Project Management, Marketing, and Finance.

STUDENT DEMAND

BS in Computer Science enrollment is expanding

From Fall 2019 until Fall 2024 BS in Computer Science enrollment grew at a 4.9% CAGR, adding almost 75,000 students.



Key Takeaways

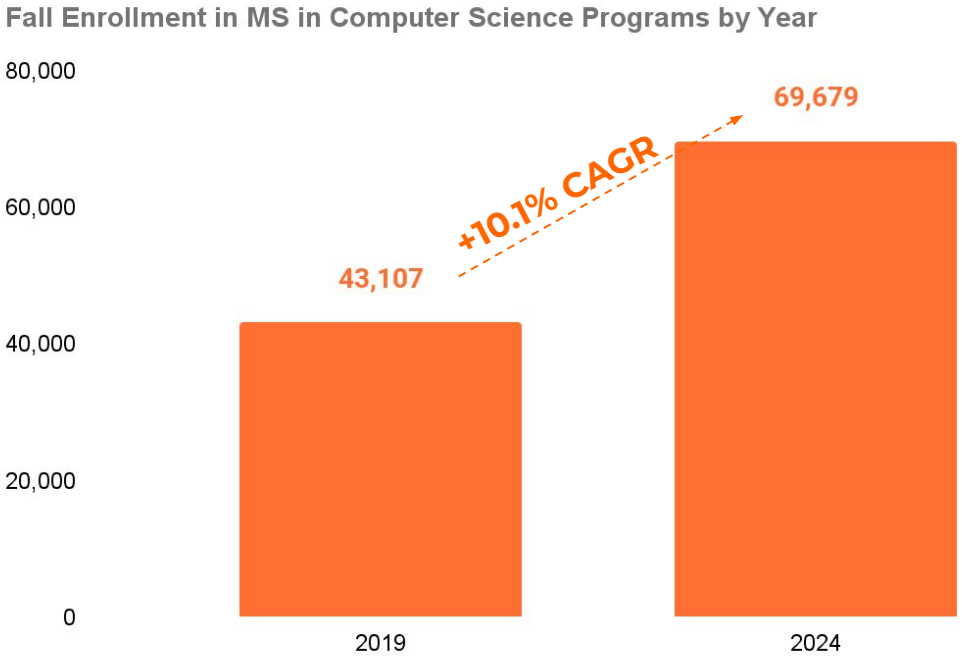
- From Fall 2019 to Fall 2024 BS in Computer Science enrollment grew at a 4.9% CAGR, from 276,866 to 350,885. During this time frame, all bachelor's-level enrollment declined at a -0.7% CAGR.
- As of Fall 2024, the BS in Computer Science was the 5th largest bachelor's degree program, behind Business Administration, General Studies, Nursing, and Psychology.
- From AY 2018/19 to AY2023-24 new enrollment in BS in Computer Science programs grew at a 4.1% CAGR. Growth is slowing, however, as new enrollment growth from AY2022-23 to AY2023-24 was only 1.7%, and Fall 2024 actually saw new BS in Computer Science enrollment decline by 5,704 students.

Source(s): Gray Decision Intelligence with National Student Clearinghouse (NSC) Research Center

STUDENT DEMAND

MS in Computer Science enrollment grew 61.6% from ‘19 to ‘24

From Fall 2019 to Fall 2024 MS in Computer Science enrollment grew 61.6% (CAGR of 10.1%).



Key Takeaways

- From Fall 2019 to Fall 2024 MS in Computer Science enrollment grew at a 10.1% CAGR, from 43,107 to 69,679. This is significantly faster than the 0.4% CAGR observed for all master’s-level enrollment during that period.
- As of Fall 2024, the MS in Computer Science was the 5th largest master’s degree program, behind online the MBA, the Master of Business Analytics, the MSW, and the MSN.
- New enrollment in MS in Computer Science programs grew at an even higher 14.3% CAGR from AY2018-19 to AY2023-24.

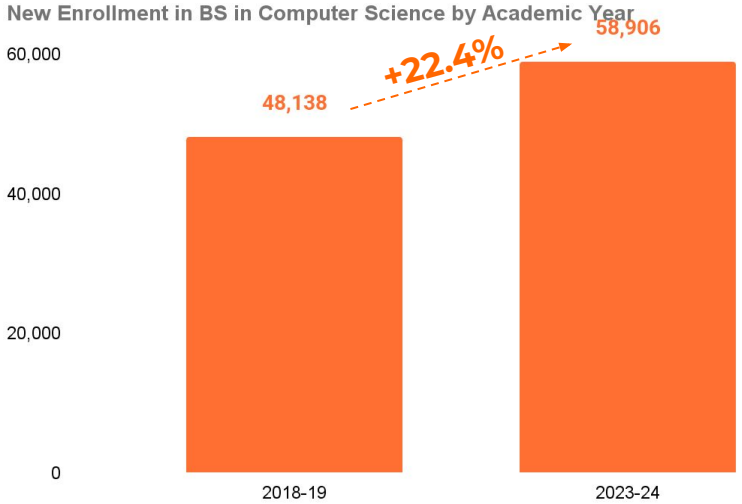
Source(s): Gray Decision Intelligence with National Student Clearinghouse (NSC) Research Center

STUDENT DEMAND

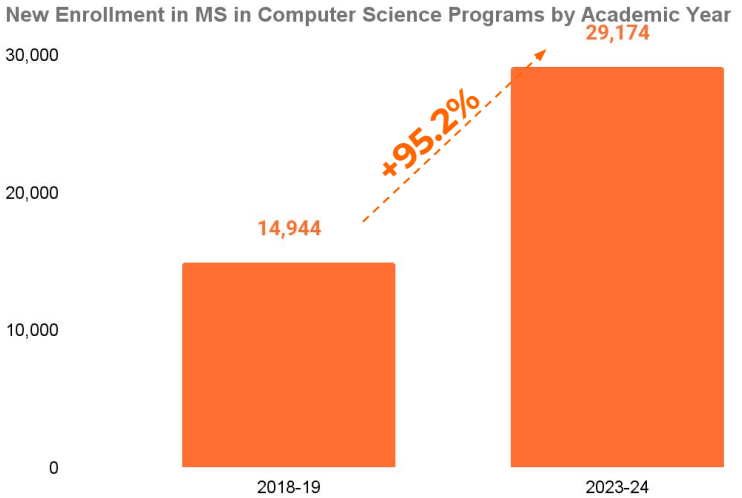
New enrollment in Computer Science degrees is booming

From AY2018-19 to AY 2023-24 new enrollment in BS in Computer Science programs grew 22.4% while new enrollment in MS in Computer Science programs grew 95.2%.

From AY2018-19 to AY2023-24 new enrollment in BS in Computer Science programs grew 22.4% (4.1% CAGR). New enrollment in all bachelor's during this time declined at a -1.0% CAGR.



From AY2018-19 to AY2023-24 new enrollment in MS in Computer Science programs almost doubled (14.3% CAGR). New enrollment in all master's during this time grew at only a 0.7% CAGR.



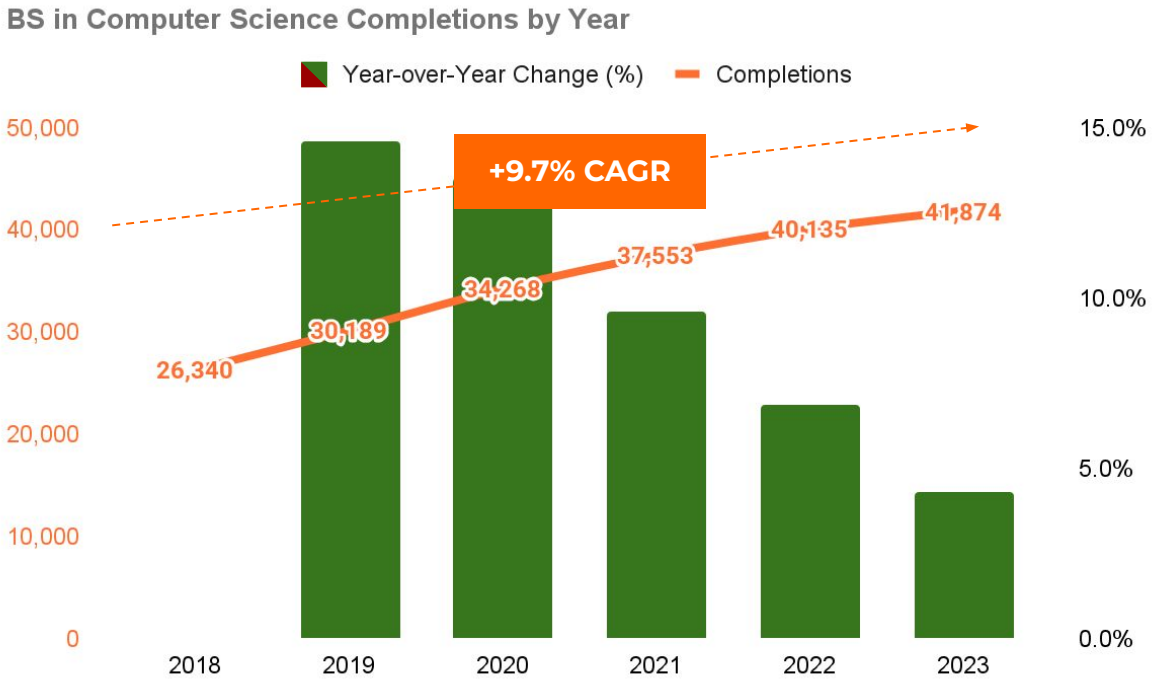
Data is for the academic year

Source(s): For charts: Gray Decision Intelligence with National Student Clearinghouse (NSC) Research Center

STUDENT DEMAND

BS in Computer Science momentum is fading

While BS in Computer Science completions have continued to grow, the year-over year growth rate declined from 14.6% in 2019 to 4.3% in 2023.



Source(s): National Center for Education Statistics (NCES) IPEDS, CIP Code 11.0701

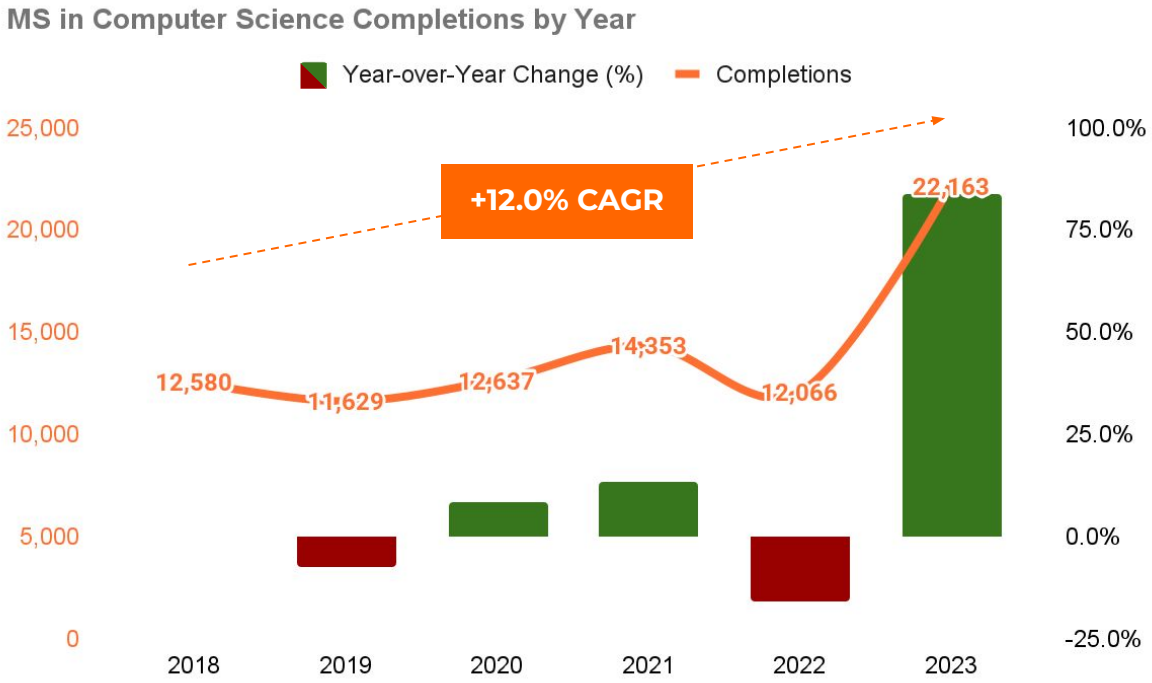
Key Takeaways

- From 2018 to 2023 BS in Computer Science completions grew at a 9.7% CAGR from 26,340 to 41,874. Even with this growth, the growth *rate* is declining. In 2019 BS in Computer Science completions grew 14.6% year-over-year, in 2020 the year-over-year growth was 13.5%, in 2021 it was 9.6%, in 2022 it was 6.9%, and in 2023 it further fell to 4.3%.
- The BS in Computer Science outperformed the broader CS/IT-related bachelor's degree market as BS in Computer Science completions grew at a 9.7% CAGR while all BS in CS/IT completions grew at a (still strong) 7.9% CAGR.
- As of 2023 35.7% of all Tech-related bachelor's degree completions were specifically in the field of Computer Science.

STUDENT DEMAND

MS in Computer Science completions exploded in 2023

After declining 4.1% from 2018 to 2022, MS in Computer Science completions grew 83.7% year-over-year in 2023.



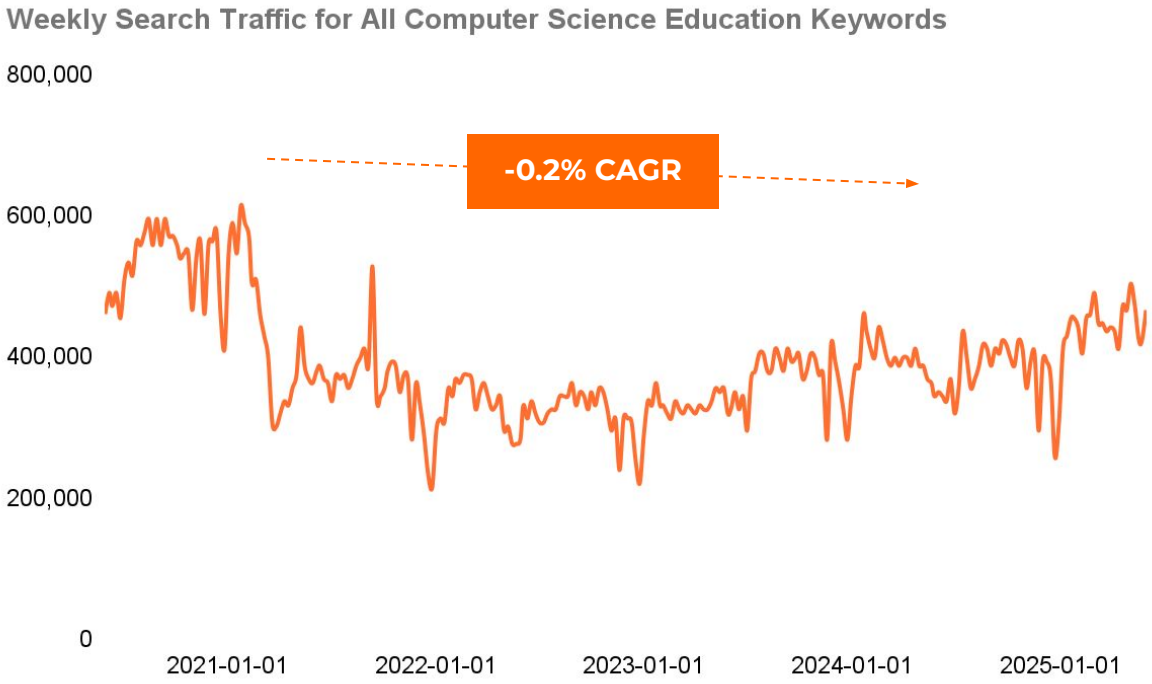
Key Takeaways

- From 2018 to 2023 MS in Computer Science completions grew at a strong 12.0% CAGR. All of the growth was realized in 2023, though. From 2018 to 2022 MS in Computer Science completions declined 4.1%, however in 2023 these completions boomed and grew 83.7% year-over-year, pulling up to 2018 to 2023 CAGR to 12.0%.
- All CS/IT-related master's degree completions grew at a 12.9% CAGR from 2018 to 2023, meaning that even though the MS in Computer Science saw strong growth with a CAGR of 12.0%, it still underperformed compared to the broader Tech-related master's degree market.

Source(s): National Center for Education Statistics (NCES) IPEDS, CIP Code 11.0701

All Computer Science education searches are stagnant

From 2021 to 2024 searches for all keywords related to all types of Computer Science education declined at a -0.2% CAGR.



Source(s): Google Trends via Glimpse

Key Takeaways

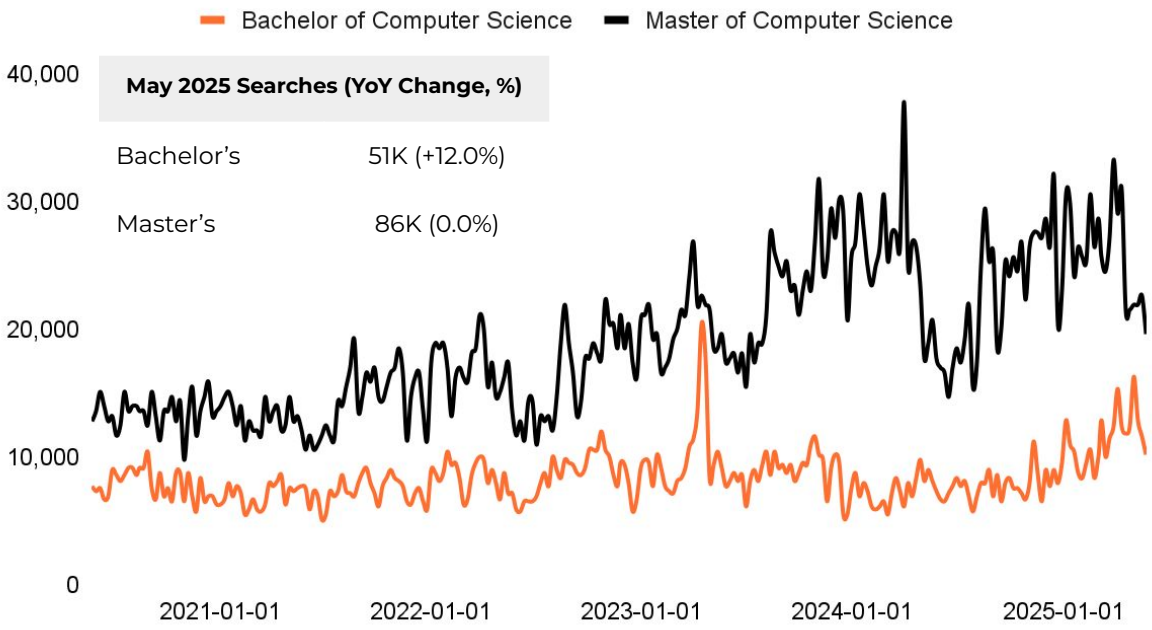
- From 2021 to 2024 searches for all keywords related to all types of Computer Science education declined at a -0.2% CAGR. During this same time, searches for Bachelor's and Master's of Computer Science keywords (combined) grew at a 14.2% CAGR, indicating that those intending to upskill in the domain of Computer Science are increasingly looking to these degrees.
- Over the past twelve months (rolling) searches for keywords related to all Computer Science education programs grew 6.7%. Compare this to Bachelor of Computer Science traffic which is up 12.0% and Master of Computer Science traffic which is flat.

STUDENT DEMAND

Searches for Computer Science degrees is up

From 2021 to 2024 searches for keywords related to bachelor's and master's degrees in Computer Science (combined) grew at a 14.2% CAGR.

Weekly Search Traffic for Keywords Related to Computer Science Degrees



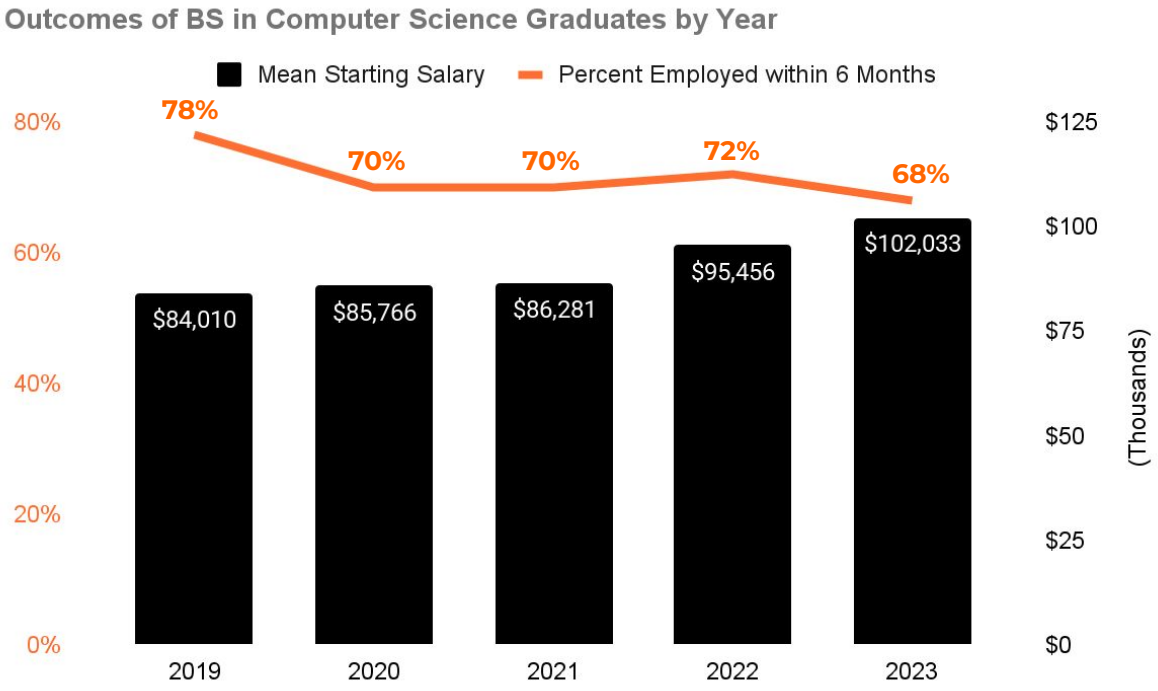
Source(s): Google Trends via Glimpse

Key Takeaways

- The MS in Computer Science typically sees more search traffic than the BS in Computer Science, with the master's degree seeing ~86,000 searches over the past month and the bachelor's degree seeing ~51,000 searches.
- From 2021 to 2024, the BS in Computer Science saw search traffic grow at just a 1.8% CAGR, however, traffic for the most recent rolling twelve months is up 12.0% from the previous twelve months.
- From 2021 to 2024, the MS in Computer Science saw search traffic grow much faster than the bachelor's, growing at a CAGR of 19.7%. In the most recent rolling twelve months, however, traffic was flat compared to the previous twelve months.

BS in Computer Science outcomes are worsening

From 2019 to 2023 the employment rate of recent BS in Computer Science graduates fell from 78% to 68%.



Source(s): National Association of Colleges and Employers (NACE)

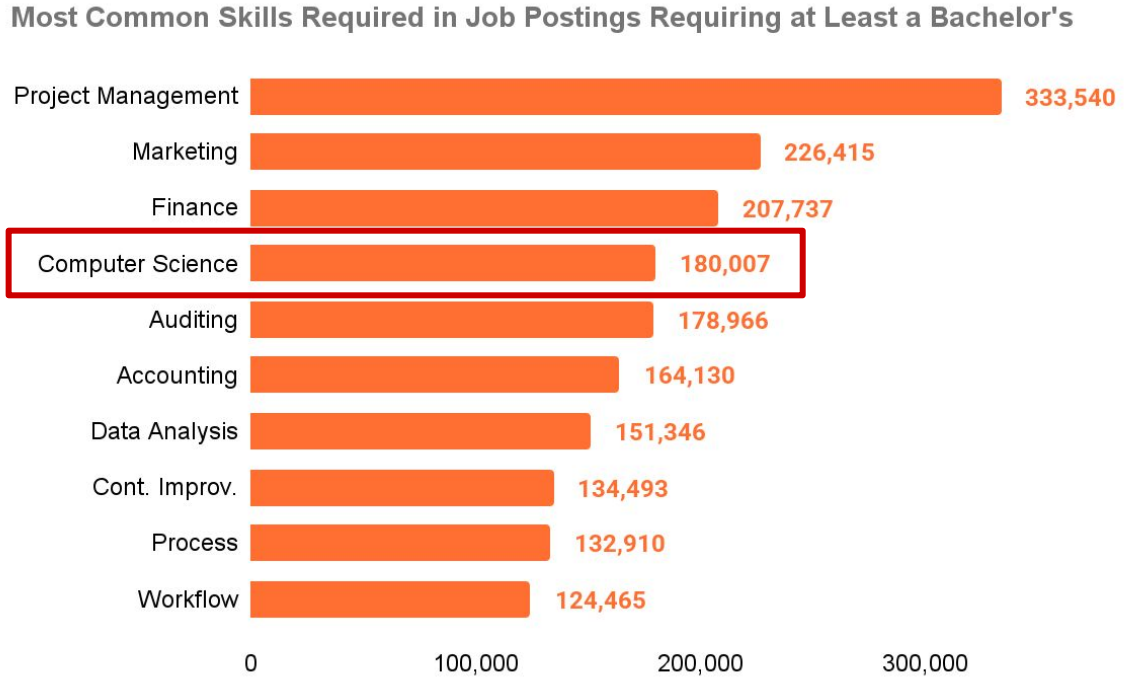
Key Takeaways

- From 2019 to 2023, BS in Computer Science completions grew at an 8.6% CAGR, from 30,145 to 41,873. During this growth, however, outcomes worsened. The employment rate of BS in Computer Science graduates declined from 78% in 2019 to 68% in 2023. During this period, the employment rate of all recent bachelor's graduates declined slightly from 65% to 62%.
- The mean starting salary of BS in Computer Science graduates grew 21.5% from 2019 to 2023 - slightly slower than the 23.1% growth in average salaries across the board in the United States. For the class of 2023, the mean starting salary of all bachelor's recipients was $63,721, while the mean for BS in Computer Science graduates was $102,033 (60.1% higher).

LABOR MARKET DEMAND

Almost 11% of bachelor's+ job postings require Computer Science skills

Computer Science is the 4th most common skill sought in job postings requiring at least a bachelor's degree.



Source(s): Market Research Institute International

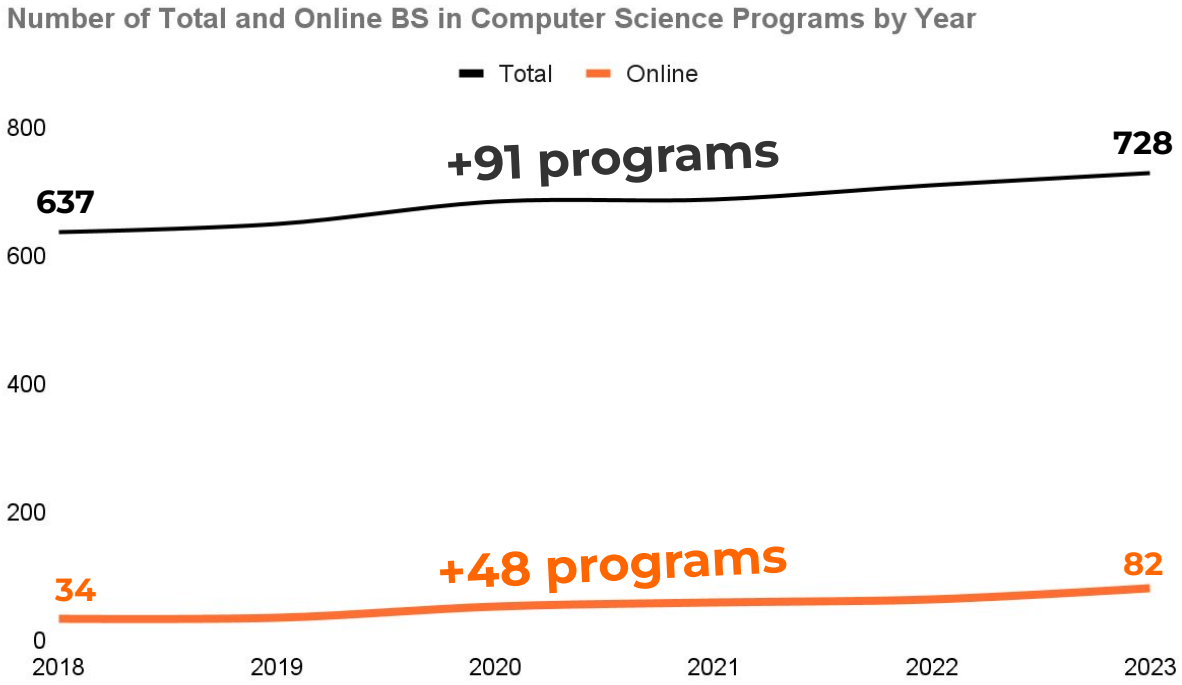
The Winter 2024 survey by the National Association of Colleges and Employers (NACE) found that 62.8% of employers will hire BS in Computer Science graduates in 2025, tied for the second most in-demand major with Accounting and behind only Finance..

Key Takeaways

- Of the 1.66 million job postings requiring a bachelor's degree posted between January 2024 and April 2025, 10.8%, or 180,007 call for Computer Science skills.
- Lightcast data shows that from June 2024 to May 2025, all job postings calling for Computer Science skills grew 7.3%.

BS in Computer Science competition is growing rapidly

From 2018 to 2023 the number of BS in Computer Science programs available in the market grew 14.3% (CAGR of 2.7%).



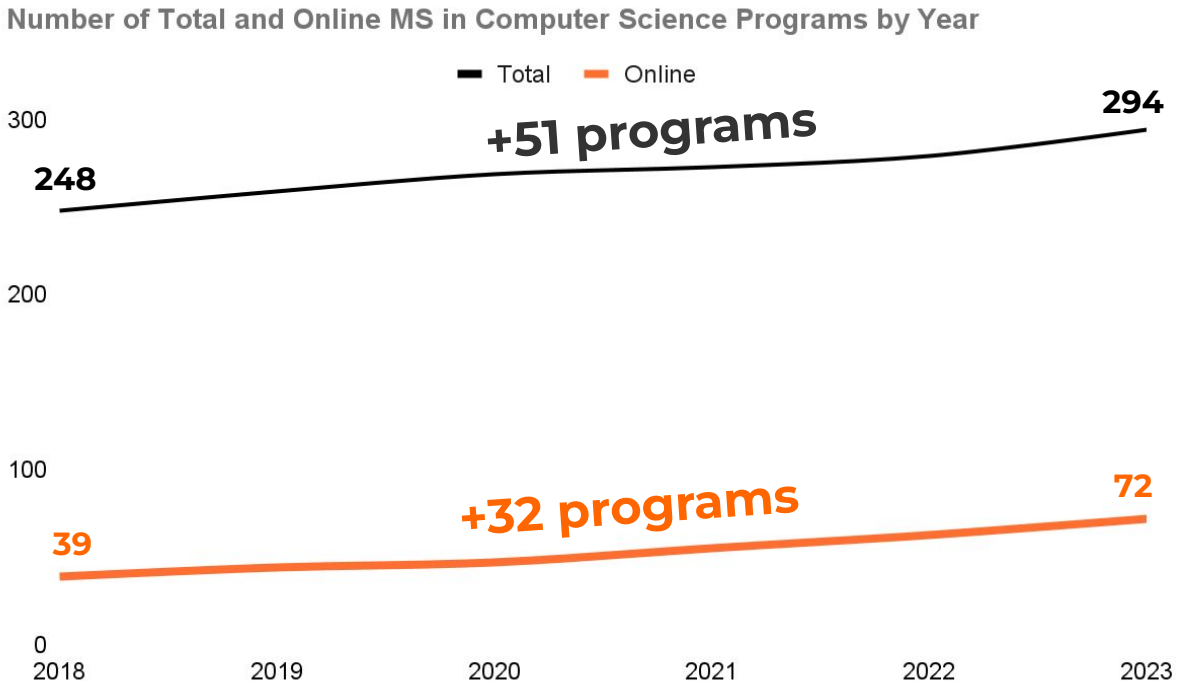
Source(s): National Center for Education Statistics (NCES) IPEDS

Key Takeaways

- From 2018 to 2023, BS in Computer Science completions grew at a 9.5% CAGR. During that same period, the number of BS in Computer Science programs offered grew at only a 2.7% CAGR. Accordingly, the average number of completions per program grew from 41 to 57 (CAGR of 6.8%).
- In 2018 just 5.3% of BS in Computer Science programs were available online, however by 2023 that share was up to 11.3%.
- As of 2023, 9.5% of all BS in Computer Science completions were conferred by a program that was available online. Eduventures/Encoura projects that online bachelor's enrollment in Computing programs will grow 21% from 2023/24 to 2026/27, and that as of 2026/27, 24% of bachelor's-level Computing enrollments would be online.

MS in Computer Science competition is ramping up quickly

From 2018 to 2023 the number of MS in Computer Science programs available in the market grew 18.5% (CAGR of 3.5%).



Source(s): National Center for Education Statistics (NCES) IPEDS

Key Takeaways

- From 2018 to 2023, MS in Computer Science completions grew at a 12.0% CAGR. During that same period, the number of MS in Computer Science programs offered grew at only a 3.5% CAGR. Accordingly, the average number of completions per program grew from 51 to 75 (CAGR of 8.0%).
- Between 2018 and 2023 the number of online MS in Computer Science programs grew at a 13.0% CAGR. As of 2023, 24.5% of MS in Computer Science programs were available online but 34.5% of MS in Computer Science completions came from these programs.
- From 2012 to 2023, MS in Computer Science completions from programs offered online grew at a 15.5% CAGR while completions from programs not offered online grew only a 10.4% CAGR.

The Computer Science/Information Technology Education Market

Cybersecurity

Cybersecurity Demand Trends

Cybersecurity programs are on a rapid growth trajectory. From 2016 to 2023 all Cybersecurity completions grew at a 16.8% CAGR. Online completions (or completions from institutions that offer the program online) are growing even faster at a CAGR of 19.8%. Universities continue to face stiff competition from industry certification providers in the field of Cybersecurity, as over the past ~10 years there has been an average of just under 20,000 Cybersecurity completions from colleges and universities per year compared to an average of about 46,000 completions of industry certifications in the field. This strong competition from industry certification providers is projected to continue to grow, as Grand View Research projects that the market for Cybersecurity training (excluding higher education) will grow at a 15.0% CAGR through 2030.

This explosion in enrollment in Cybersecurity programs follows a significant expansion in business spend on information security. As of 2025, Cybersecurity is projected to comprise 3.3% of all Tech spending in the United States. From 2025 to 2029 total spend on Cybersecurity is projected to grow at a 7.1% CAGR from $88.25B to $116.15B. In addition to the overall growth, 56% of companies indicate that they are discussing or implementing plans to increase Cybersecurity headcount.

This increased spend has caused the Cybersecurity workforce in the United States to grow at a 5.7% CAGR from 2014 to 2024. As a result, 20.4% of the Tech workforce in the United States is now employed in Cybersecurity. The gap between Cybersecurity growth and overall Tech growth is projected to continue, as well. Over the next decade, Cybersecurity employment is projected to grow 30.4% while total Tech employment is projected to grow between 13.1% and 18.4%. As a result, Cybersecurity is projected to represent 22.4% of the Tech workforce in 2033. In spite of this, Cybersecurity remains underrepresented in higher education as only 10.5% of all Tech graduates in 2023 completed a program in Cybersecurity.

Much of the growth observed in Cybersecurity enrollment has been in bachelor's degrees in the field. Fall enrollment in BS in Cybersecurity programs grew at a 22.5% CAGR from 2018 to 2024. The BS in Cybersecurity was the second-fastest growing bachelor's degree in terms of absolute volume of total enrollment growth over the past five years, adding 53,480 students. New enrollment and completions of BS in Cybersecurity programs are both expanding at a similar rate, growing at a 17.6% CAGR and 17.8% CAGR respectively.

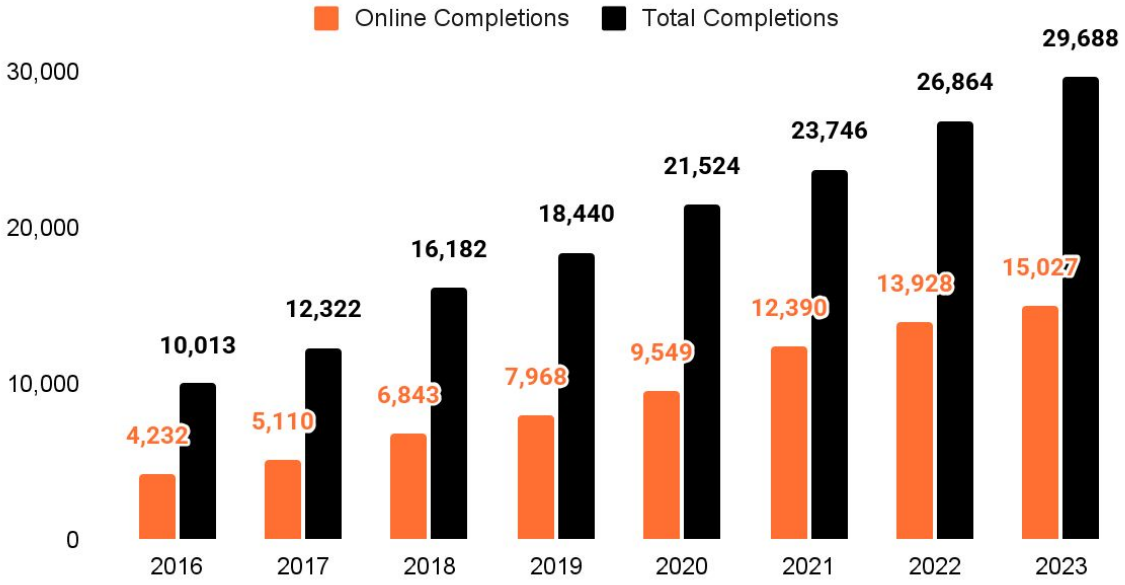
STUDENT DEMAND

Cybersecurity completions have seen sustained, rapid growth

From 2016 to 2023 all Cybersecurity completions grew at a 16.8% CAGR, from 10,013 to 29,688. During that time online completions grew at a 19.8% CAGR.

Online and Total Cybersecurity Completions by Year

Includes all award levels



An additional ~46,000 people per year have completed industry certifications in the field of Cybersecurity.

Source(s): Gray Decision Intelligence with National Center for Education Statistics (NCES) IPEDS

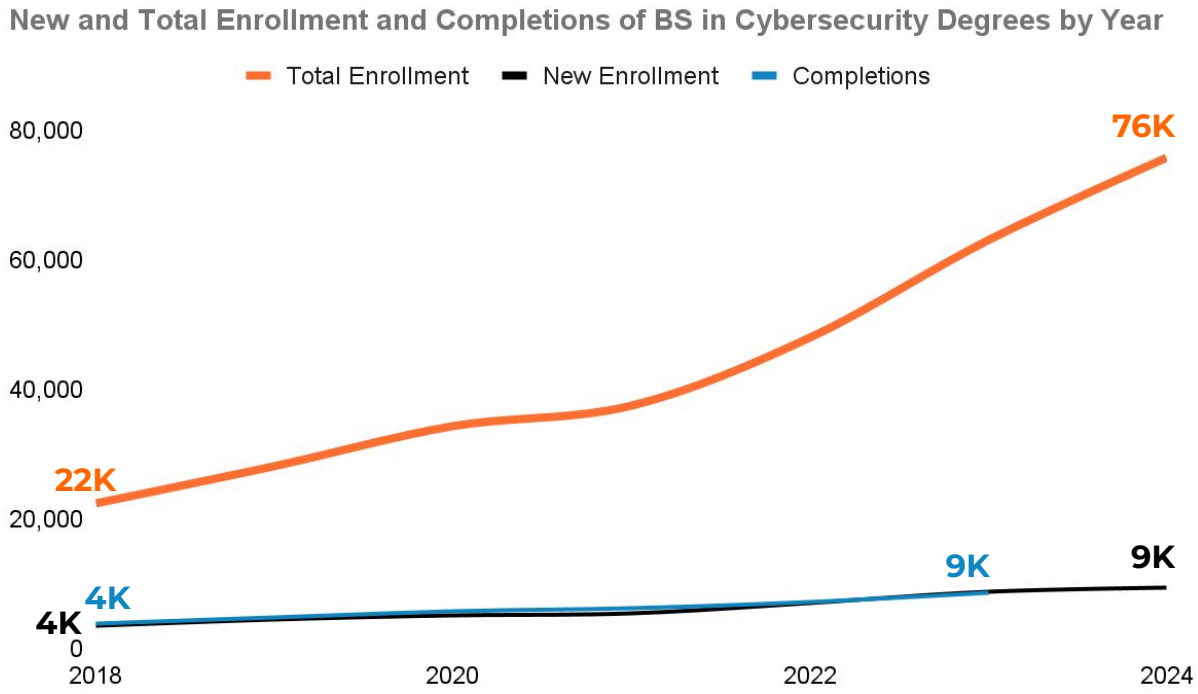
Key Takeaways

- Cybersecurity completions have seen sustained and rapid growth since at least 2016. From 2016 to 2023 all Cybersecurity completions across all program levels grew at a 16.8% CAGR from 10,013 to 29,688. 2023 did see a slightly decelerated (but still rapid) growth rate, growing 10.5% year-over-year.
- Online Cybersecurity completions are growing even faster than aggregate Cybersecurity completions. From 2016 to 2023, while all Cybersecurity completions grew at a 16.8% CAGR, specifically online completions (or completions from a program offered via distance education) grew at a 19.8% CAGR. Online Cybersecurity completions also saw a slight deceleration in 2023, however as of 2023, 50.6% of all completions in the field were online.

STUDENT DEMAND

BS in Cybersecurity enrollment is booming and accelerating

From Fall 2018 to Fall 2024 total enrollment in BS in Cybersecurity programs grew at a 22.5% CAGR and new enrollment grew at a 17.6% CAGR.



Key Takeaways

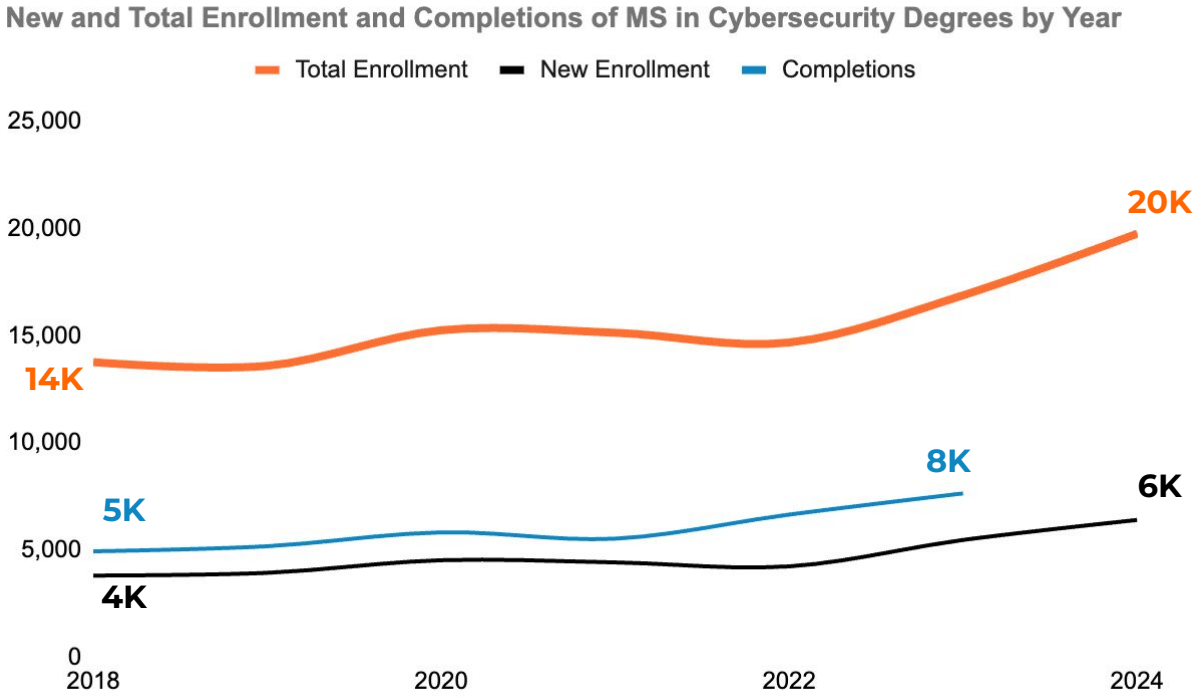
- BS in Cybersecurity enrollment grew at a 22.5% CAGR from Fall 2018 to Fall 2024.
- New enrollment in BS in Cybersecurity programs grew at a 17.6% CAGR from Fall 2018 to Fall 2024 and BS in Cybersecurity completions grew at a 17.8% CAGR from 2018 to 2023.
- Growth has accelerated for both new and total enrollments. In the case of Total BS in Cybersecurity enrollment, the CAGR observed between 2018 and 2021 was 18.7%, and then from 2021 to 2024 the observed CAGR was up to 26.4%. In the case of new BS in Cybersecurity enrollment, the observed CAGR between 2018 and 2021 was 14.8%, then from 2021 to 2024 the observed CAGR was up to 20.5%.

Source(s): Gray Decision Intelligence with National Student Clearinghouse (NSC) Research Center

STUDENT DEMAND

MS in Cybersecurity enrollment is trending upward

From Fall 2018 to Fall 2024 MS in Cybersecurity enrollment grew at a 6.2% CAGR and new enrollment grew at an even faster 9.0% CAGR.



Key Takeaways

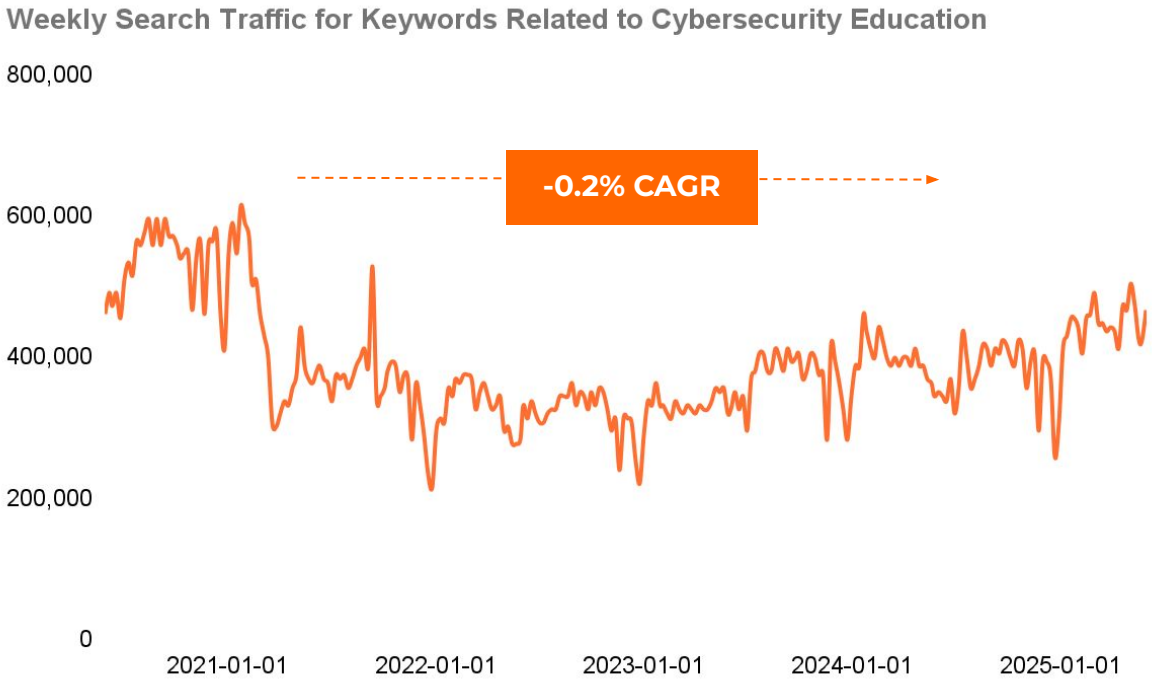
- From Fall 2018 to Fall 2024 MS in Cybersecurity enrollment grew at a 6.2% CAGR, much slower than the 22.5% CAGR observed for BS in Cybersecurity enrollment.
- New enrollment in MS in Computer Science programs is growing faster than total enrollments in the program, with a CAGR of 9.0% from 2018 to 2024. The MS in Cybersecurity was the fastest growing master's degree in terms of year-over-year new enrollment growth in 2023, and in 2024 it ranked as the fourth fastest.
- MS in Cybersecurity completions grew at a 9.1% CAGR from 2018 to 2023.

Source(s): Gray Decision Intelligence with National Student Clearinghouse (NSC) Research Center and National Center for Education Statistics (NCES) IPEDS, Validated Insights analysis

STUDENT DEMAND

Google searches for Cybersecurity education dipped and rebounded

From H2 2020 to H2 of 2021 searches for Cybersecurity education dropped 33.0%. From 2022 to 2024, however, traffic grew 18.9% (9.0% CAGR).



Source(s): Google Trends via Glimpse, Gray Decision Intelligence

Key Takeaways

- Search traffic for keywords related to Cybersecurity education (the field of study as defined by Google) hit a recent peak in 2020, and then dropped. From the 2nd half of 2020 to the 2nd half of 2021 traffic dipped 33.0%.
- Cybersecurity education search traffic has since rebounded and is on a moderate growth trajectory, as volume grew at a 9.0% CAGR from 2022 to 2024.
- In December of 2020, Gray Decision Intelligence reports that search traffic more specifically related to Cybersecurity programs in higher education were about 45,000 - or ~2% of Cybersecurity education searches. Then, in 2023 this more higher education-specific traffic was up almost 10X to about 433,000 - or ~25% of Cybersecurity education traffic.

LABOR MARKET DEMAND

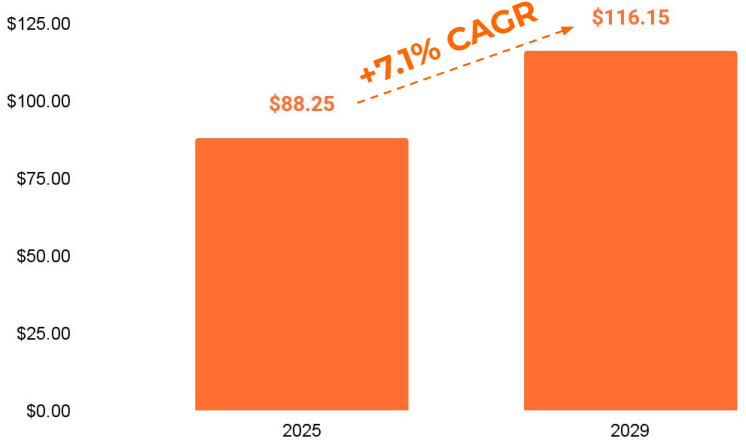
Cybersecurity spend is growing, expanding employment opportunities

From 2025 to 2029 Cybersecurity spend in the United States is projected to grow at a 7.1% CAGR. 56% of companies intend to increase Cybersecurity team sizes.

Cybersecurity spend in the United States is projected to grow at a 7.1% CAGR from 2025 to 2029. As of 2025, Cybersecurity spend is estimated to be 3.3% of total IT spending in the United States.

Projected Spend on Cybersecurity in the US in 2025 and 2029

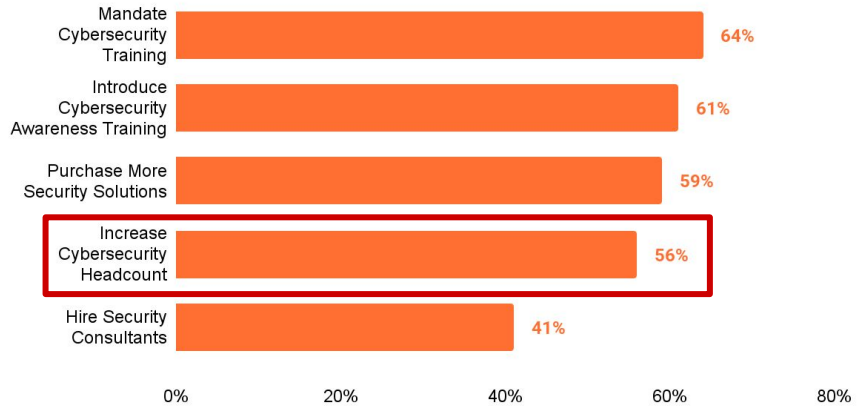
Billions, USD ($)



While Cybersecurity spend is growing, 56% of companies are planning to utilize increased spend to increase Cybersecurity team sizes.

Cybersecurity Operational Improvements Discussed in 2024

Percent of companies planning or discussing improvement

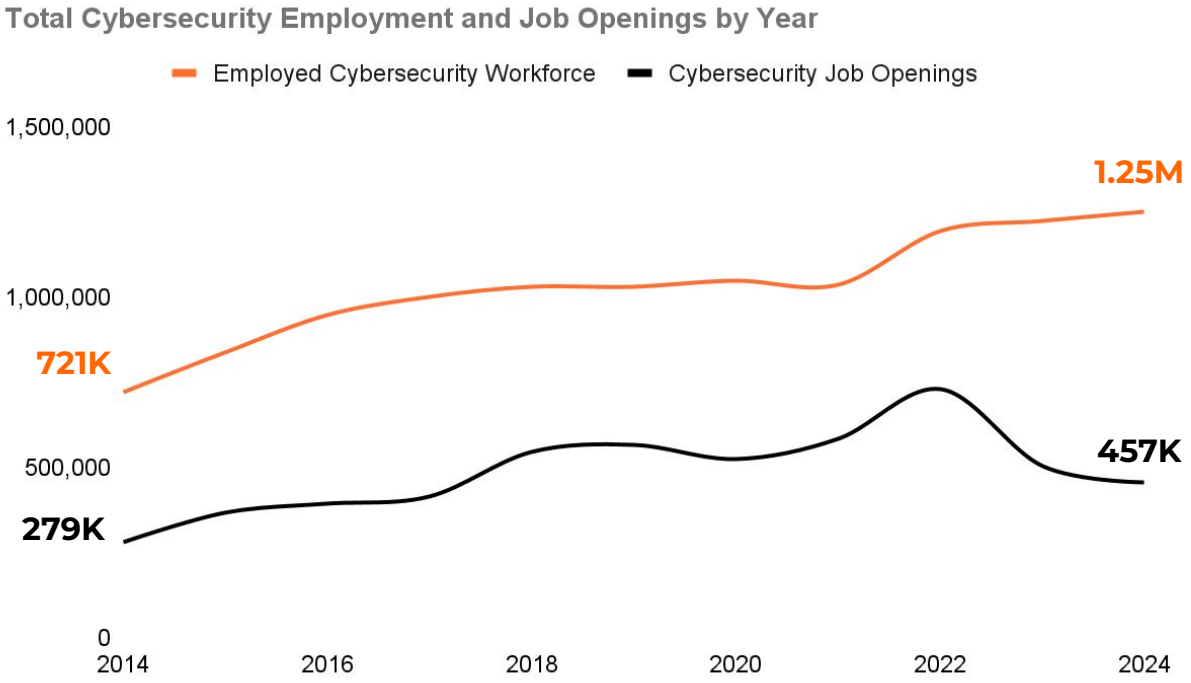


Source(s): For chart on the left: Forrester and Statista, For chart on the right: Fortinet Training Institute

LABOR MARKET DEMAND

The Cybersecurity workforce is growing

From 2014 to 2024, employment of Cybersecurity professionals grew at a 5.7% CAGR and the number of Cybersecurity job openings grew at a 5.1% CAGR.



Key Takeaways

- From 2014 to 2024, the aggregate workforce in the United States grew at a 0.3% CAGR. Cybersecurity fared much better, growing at a 5.7% CAGR during that time.
- Total employment in Cybersecurity has grown faster than the annual number of job openings in the field, with employment growing at a 5.7% CAGR and openings growing at a 5.1% CAGR. From 2022 to 2024, however, hiring demand soured and job openings declined at a -20.9% CAGR.
- From 2023 to 2033 the BLS projects that employment of *Information Security Analysts* will grow at a 2.7% CAGR, this mirrors the growth projected by CompTIA and Lightcast.

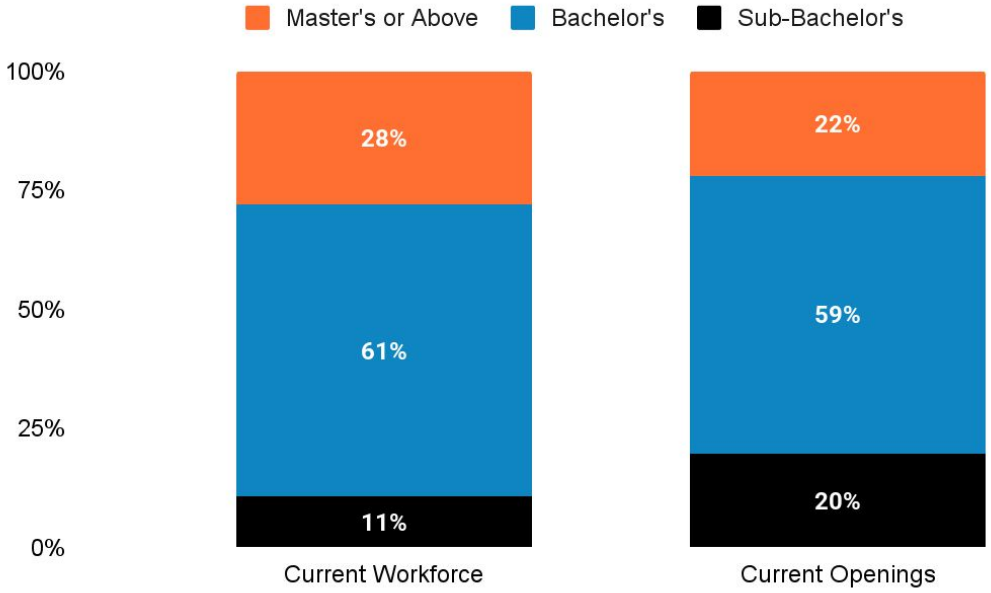
Source(s): Cyberseek

LABOR MARKET DEMAND

The Cybersecurity workforce is demanding lower ed. attainment

As it stands, 89% of the current Cybersecurity workforce has at least a bachelor's degree, but only 80% of openings require a bachelor's or above.

Educational Attainment of Current Cybersecurity Workforce and Current Cybersecurity Job Openings



Key Takeaways

- Currently 28% of the Cybersecurity workforce in the United States has a graduate degree and an additional 61% has a bachelor's degree, leaving just 11% without a bachelor's or above.
- Job openings are requiring a lower degree of educational attainment than currently exists in the market, as 20% of Cybersecurity job openings require less than a bachelor's degree.

Per ISC2, Cybersecurity professionals rank industry/professional certifications above degrees in Cybersecurity in terms of the value they derived from pursuing the program.

- 62% indicated their industry/professional certification was "very valuable",
- 55% indicated their graduate degree in Cybersecurity was "very valuable",
- And 48% indicated their bachelor's degree in Cybersecurity was "very valuable".

Source(s): Hozza and Kaspersky

The Computer Science/Information Technology Education Market

Data Analytics/Science

Data Analytics/Science Demand Trends

Data Analytics/Science is one of, if not the fastest growing field of study in the United States. From Fall 2021 to Fall 2024 enrollment in Data Analytics/Science programs grew more than 7X. CIP Codes directly associated with these programs were just recently added in the 2020 revision by the National Center for Education Statistics (NCES), and enrollments in the program were first reported in Fall 2020. From the inception of the CIP Codes, enrollment in Data Analytics/Science programs (across all award levels) has grown at an astounding 195.1% CAGR.

Over that Fall 2020 to Fall 2024 time period, growth has not only been observed in master's degree programs in the field(s), but bachelor's programs as well. Over that span the following growth was observed:

- MS in Data Analytics enrollment grew at a 202.9% CAGR to 18,262,
- BS in Data Science enrollment grew at a 181.4% CAGR to 14,955,
- MS in Data Science enrollment grew at a 197.5% CAGR to 14,340,
- And BS in Data Analytics enrollment grew at a 176.8% CAGR to 13,802.

While enrollment has been fairly evenly distributed between Data Analytics and Data Science, the workforce is not. As of 2024 there are estimated to be about 4 million Data Analysts in the United States and only about 200,000 Data Scientists. This is borne out in job posting and job seeker data as well, as in May 2025 there were 375,000 people seeking employment as a Data Analyst and only 152,000 seeking employment as a Data Scientist.

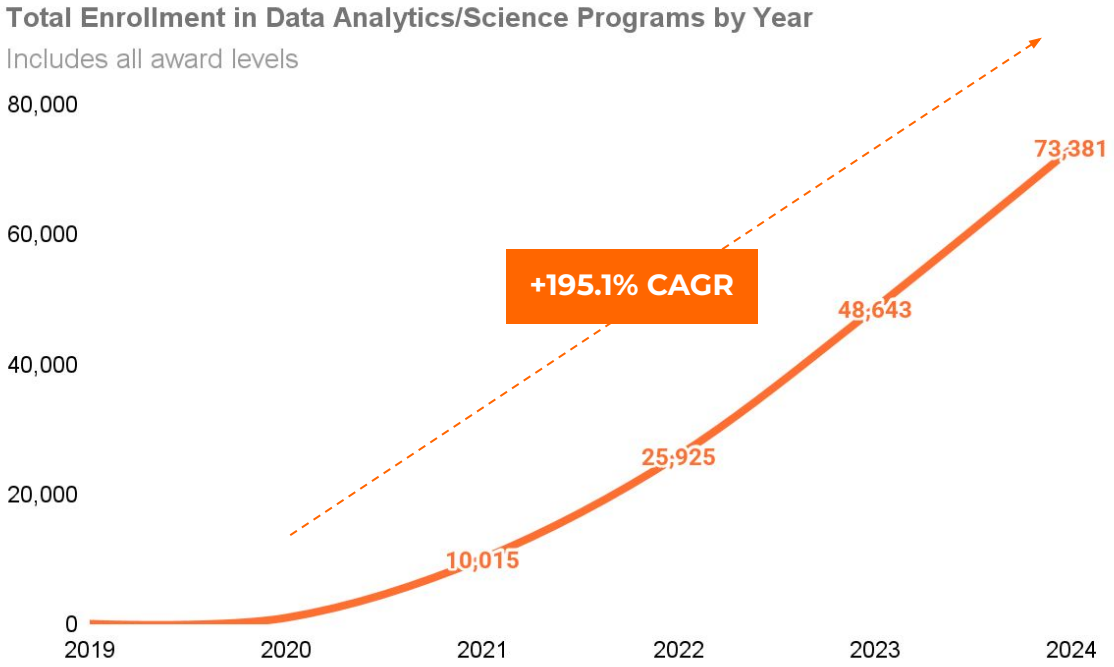
While there is a substantial difference in volume of job seekers, there are significantly more people seeking employment as a Data Scientist than would be expected given the size of the workforce. There were 202,900 Data Scientists in 2024, and there are 151,600 people seeking employment as a Data Scientist (1.3 persons employed per job seeker) compared to Data Analysts where there were 4 million employed and 375,446 seeking employment (10.7 persons employed per job seeker).

Data Science typically commands a higher degree of educational attainment than Data Analytics. 47% of the Data Science workforce currently has a graduate degree compared to just 20% of the Data Analytics workforce. And 34% of current Data Science job postings call for a graduate degree compared to only 6% for Data Analytics job postings.

STUDENT DEMAND

Data Analytics/Science enrollment is growing exponentially

Enrollments in the field(s) of Data Analytics/Science were first reported in 2020. Since then enrollment has grown at an astounding 195.1% CAGR.



Key Takeaways

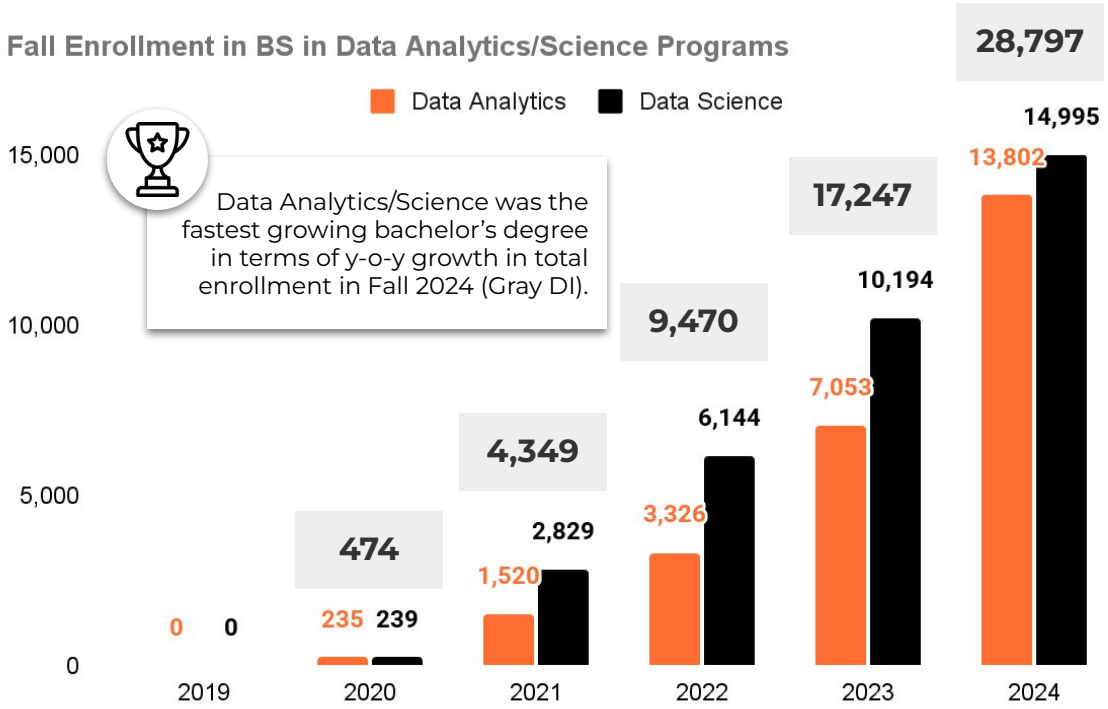
- From Fall 2020 to Fall 2024 enrollment across all award levels in Data Analytics/Science programs grew at an astounding 195.1% CAGR. This is substantially faster than the 0.6% CAGR observed for all enrollments.
- From Fall 2021 to Fall 2024 enrollment in Data Analytics/Science programs (across all award levels) grew by more than 7X.
- From Fall 2023 to Fall 2024 enrollment in these programs grew 50.9%.
- From 2021 to 2023 all completions of Data Analytics and Data Science programs (across all award levels) grew 458.1% from 1,605 to 8,958 (CAGR of 136.2%).

Source(s): National Center for Education Statistics (NCES) IPEDS and National Student Clearinghouse (NSC) Research Center, Validated Insights analysis

STUDENT DEMAND

BS in Data Analytics/Science enrollment is growing exponentially

From Fall 2020 to Fall 2024 enrollment in BS in Data Analytics/Science programs grew at an astounding 179.2% CAGR.



Key Takeaways

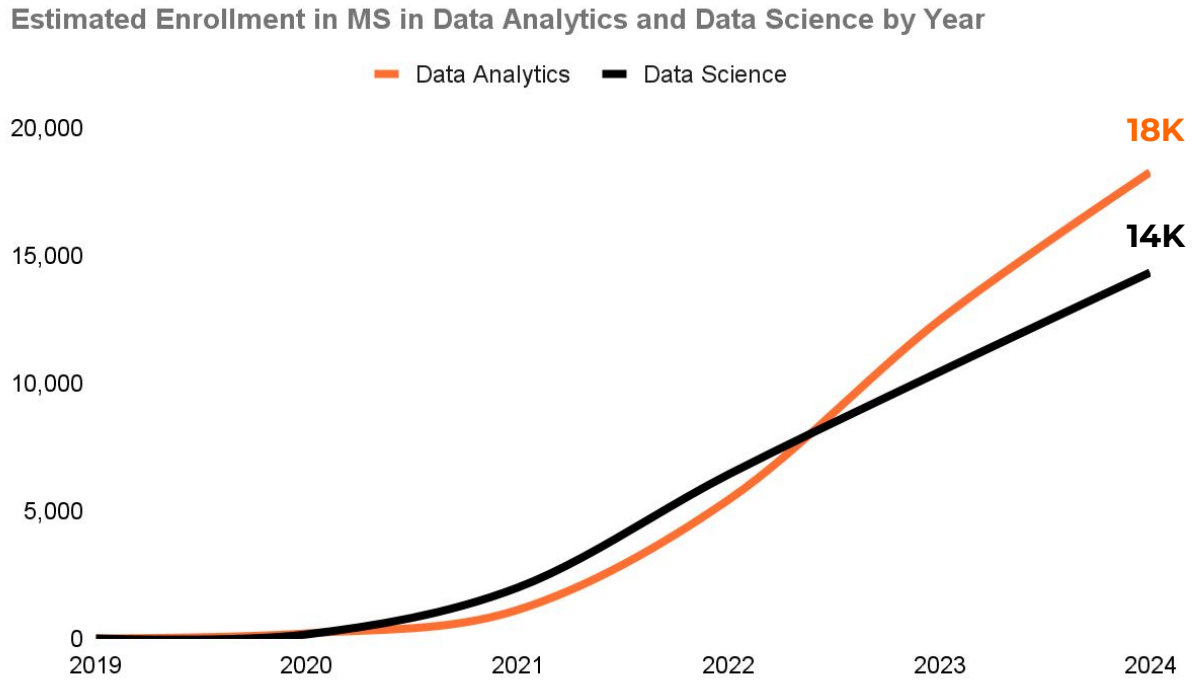
- After relevant CIP codes were first introduced in the 2020 CIP code taxonomy update, institutions reported that enrollment in BS in Data Analytics/Science programs grew exponentially, at a CAGR of 179.2%. *Enrollment in these programs nearly doubled each of the last three years.*
- Enrollment is fairly evenly distributed, with 13,802 enrollments in BS in Data Analytics programs (47.9%) and 14,995 students in BS in Data Science programs (52.1%) in Fall 2024. Both specific majors are also on similar growth trajectories as BS in Data Analytics enrollment grew at a 176.8% CAGR and BS in Data Science enrollment grew at 181.4% CAGR from Fall 2020 to Fall 2024. From 2023 to 2024, however, Data Analytics enrollment growth accelerated while Data Science decelerated.

Source(s): National Student Clearinghouse (NSC) Research Center, data assumes that all undergraduate enrollment at 4-year institutions is bachelor's enrollment

STUDENT DEMAND

MS in Data Analytics/Science enrollment is growing at a 200.5% CAGR

From Fall 2020 to Fall 2024 MS in Data Analytics/Science enrollment (combined) is estimated to have grown at a 200.5% CAGR.



Source(s): National Center for Education Statistics (NCES) IPEDS and National Student Clearinghouse (NSC) Research Center, enrollment in master's program is estimated based on graduate enrollment from NSC and share of graduate completions that are master's completions from NCES, Validated Insights analysis

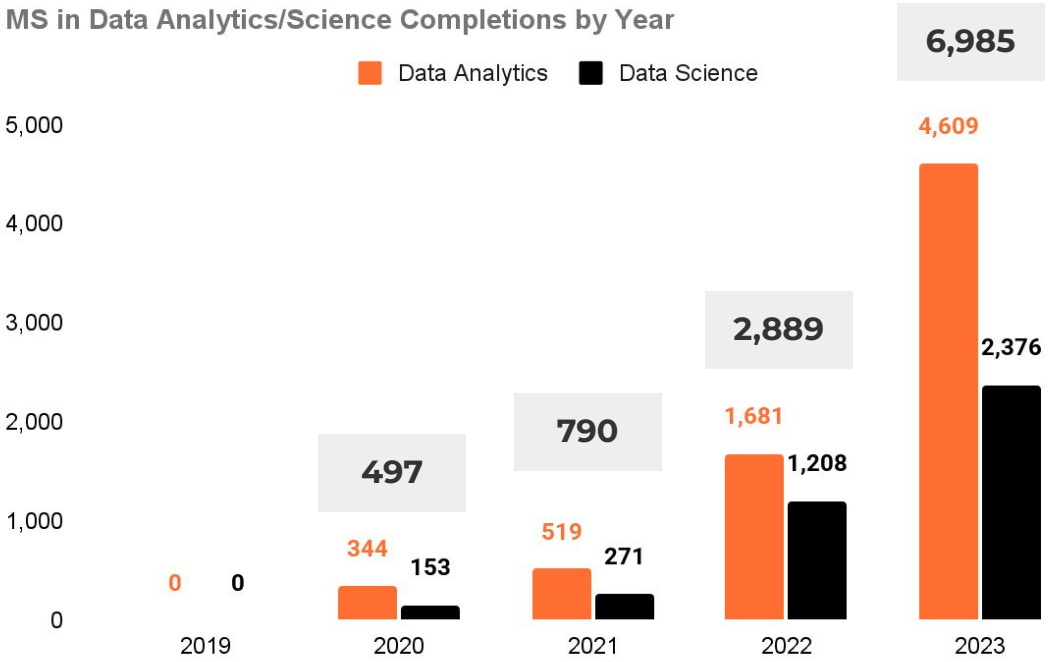
Key Takeaways

- We estimate that from Fall 2020 to Fall 2024 MS in Data Analytics/Science enrollment (combined) grew at a 200.5% CAGR.
- From Fall 2020 to Fall 2024 MS in Data Analytics enrollment grew at a 202.9% CAGR to an estimated 18,262. During that same time, MS in Data Science enrollment grew at a 197.5% CAGR to an estimated 14,340.
- Enrollment is fairly evenly distributed at the master's degree level between Data Analytics and Data Science. As of Fall 2024 it is estimated that the Data Analytics was responsible for 56.0% of master's enrollments in Data Analytics/Science programs and 44.0% of these students were in Data Science programs. Note that Data Science started (at the launch of the relevant CIP Codes) on a better trajectory but has been passed by Data Analytics.

STUDENT DEMAND

MS in Data Analytics/Science completions booming

From 2020 to 2023 completions of MS in Data Analytics/Science programs grew at a rapid 141.3% CAGR.



Source(s): American Statistical Association (ASA)

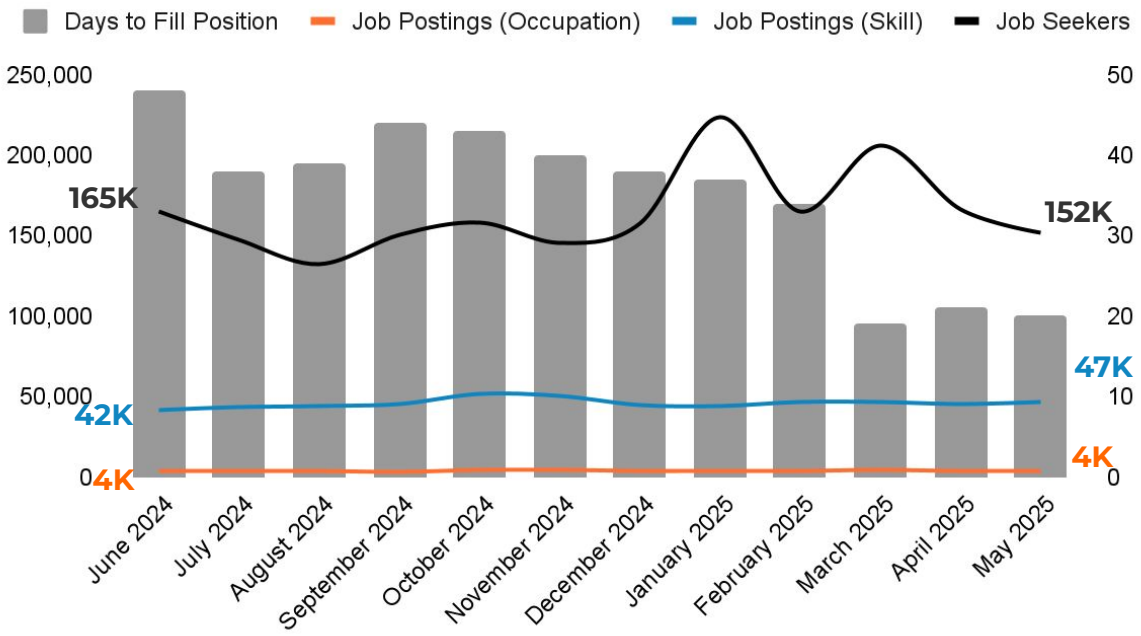
Key Takeaways

- From 2020 to 2023 completions of MS in Data Analytics/Science programs grew at a 141.3% CAGR, growing from 497 to 6,985. At the master's level, the distribution of students leans more towards Data Analytics, which saw 66.0% of completions in 2023 compared to just 34.0% for Data Science. MS in Data Analytics completions grew at a 137.5% CAGR from 2020 to 2023 while MS in Data Science completions grew at a 149.5% CAGR.
- Using CIP codes that have historically been a proxy for Data Analytics/ Science, Eduventures/Encoura reports that MS in Data Analytics/ Science completions grew at a 38.5% CAGR from 2012 to 2021.

Job postings for Data Scientists are us, as are postings for the skill

From June 2024 to May 2025 job postings for Data Scientists (occupation) grew 2.5% while postings for Data Science skills grew 11.9%.

Job Posting and Job Seeking Activity for Data Science Roles and Skills



Source(s): Indeed, Lightcast, and Public Insights

Key Takeaways

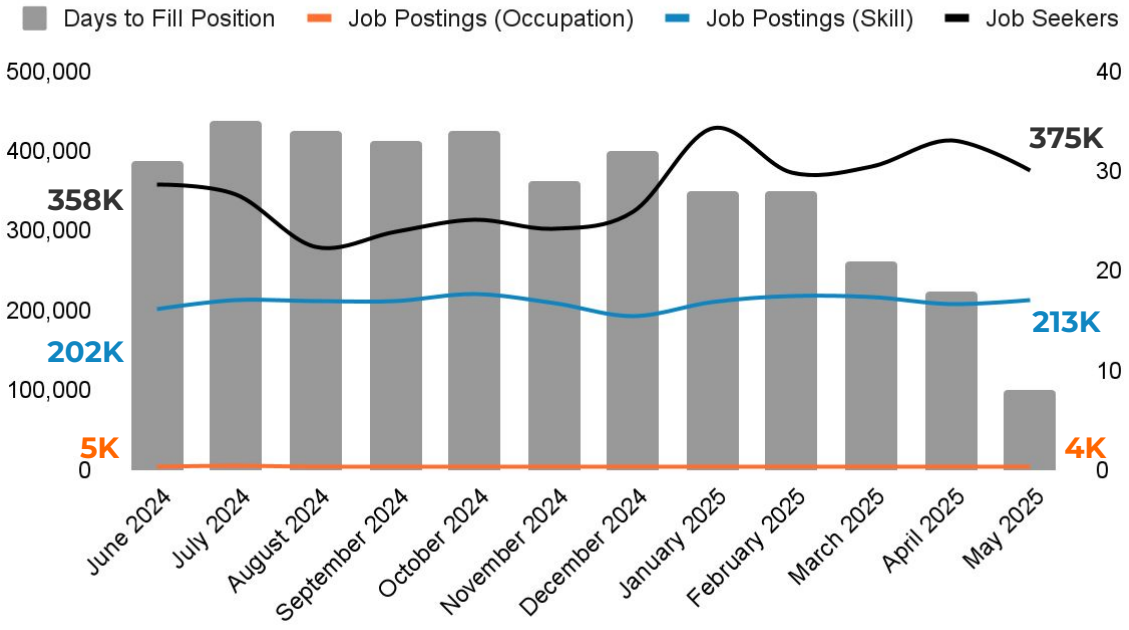
- There are more than 11X as many job postings for Data Science skills as there are for Data Scientists (occupation), with 46,859 and 4,058 respectively in May 2025.
- Job postings calling for Data Science skills grew 11.9% from June 2024 to May 2025. During this time job postings for Data Scientists also grew, but more modestly, at 2.5%.
- The number of people seeking jobs as Data Scientists declined 8.3% from June 2024 to May 2025, to 151,600. There are 37 people seeking employment as a Data Scientist for every Data Scientist job posting. Public Insights reports that the average time to fill a Data Science role declined from 48 days in June 2024 to just 20 days in May 2025. Also during that time, advertised wages grew 10.7%.

LABOR MARKET DEMAND

Data Analyst job postings down, Data Analytics job postings up

From June 2024 to May 2025 job postings for Data Analytics (occupation) jobs declined 14.3%. Postings calling for Data Analytics skills, however, grew 5.1%.

Job Posting and Job Seeking Activity for Data Analytics Roles and Skills



Source(s): Indeed, Lightcast, and Public Insights

Key Takeaways

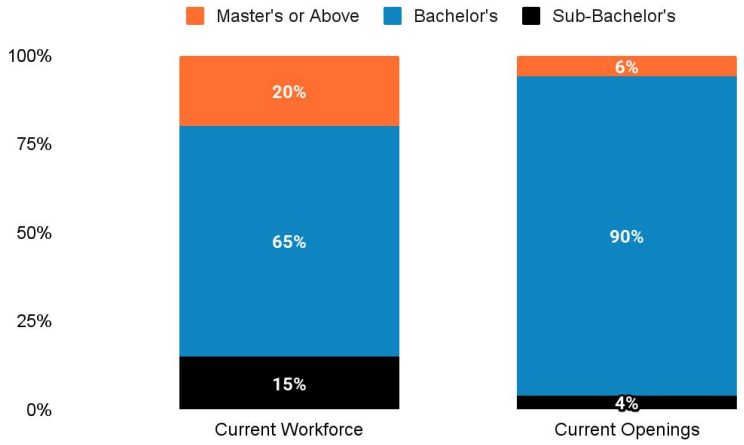
- From June 2024 to May 2025 job postings for Data Analyst roles declined 14.3% to 4,140. During the same time, job postings for all occupations calling for the skill of Data Analytics grew 5.1% to 212,758. Note that there are more than 51X as many job postings calling for Data Analytics skills as there are for Data Analysts.
- The number of people seeking employment as a Data Analyst grew 5.1% from June 2024 to May 2025 to 212,758.
- As of May 2025 there were 91 job seekers for every Data Analyst job opening. This substantial amount of available talent caused the average time to fill a Data Analyst position to drop from 31 days in June 2024 to just 9 in May 2025. Advertised wages for these roles grew 13.9% during the time.

AI adoption is growing

The share of workers using AI at work, and the share of job postings calling for AI skills is growing.

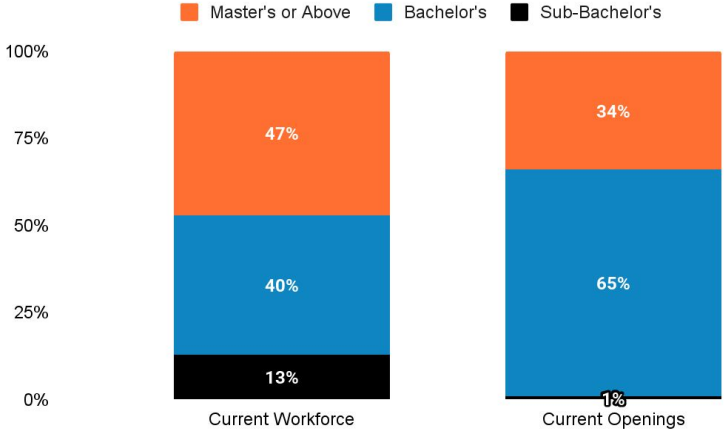
While 85% of Data Analysts have at least a bachelor's degree, 96% of job postings for Data Analyst roles call for at least a bachelor's.

Educational Attainment of Current Data Analytics Workforce and Current Data Analytics Job Openings



Data Scientists have a much higher level of educational attainment than Data Analysts, with 47% having a graduate degree. There remains a shortage of Data Scientists with just a bachelor's, however.

Educational Attainment of Current Data Science Workforce and Current Data Analytics Job Openings



Source(s): For chart on the left: Northeastern University with Lightcast and Zippia, For chart on the right: Northeastern University with Lightcast and the U.S. Bureau of Labor Statistics (BLS)

The Computer Science/Information Technology Education Market

Programming & Software Engineering

Programming & Software Engineering Demand Trends

Programming & Software Engineering is predominantly an undergraduate field of study. In spite of multiple headwinds, enrollment in BS in Programming & Software Engineering programs grew at a 5.7% CAGR from Fall 2019 to Fall 2024.

Completions of these programs grew at an 8.1% CAGR from 2018 to 2023, however that wasn't fast enough to keep pace with coding bootcamps which grew at an 18.0% CAGR during this time. Coding bootcamps surpassed bachelor's degrees in Programming & Software Engineering in 2020, and they have only separated the distance since then. In 2023 there were 36.8% more completions of coding bootcamps than BS in Programming & Software Engineering programs. Part of the explanation for this can be found in the fact that 20.4% of coding bootcamps in 2023 reported paying less than $1,000 total for their program (Forbes).

Coding bootcamps aren't the only source of competition for BS in Programming & Software Engineering providers, however. There is also community colleges & trade schools, certifications, and other online resources. In fact, only 49% of developers reported having learned to code in college even though 72% of developers have at least a bachelor's degree. An additional 82% of developers reported using online resources to learn to code, 50% utilized courses and certifications, and 11% used coding bootcamps.

Hiring demand for Software Developers remains high. As of 2023 there were 2,259,200 people employed in Software Development-related roles. That employment is projected to grow 23.9% from 2023 to 2033 when 2,799,149 people will be employed in these roles.

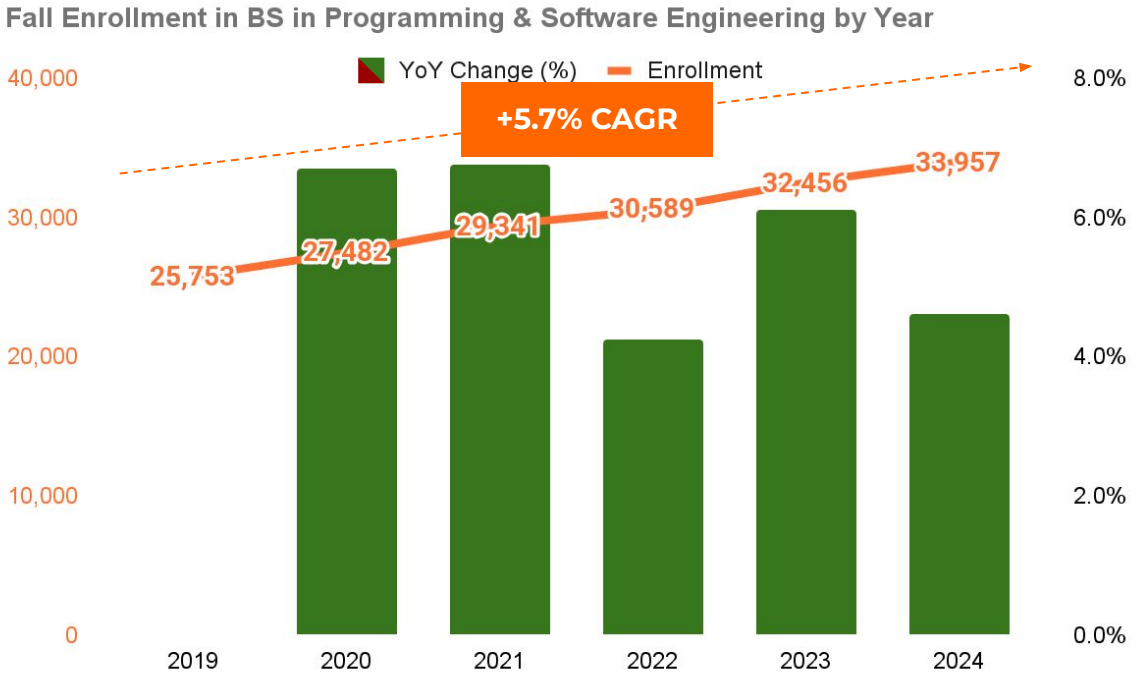
While projected employment growth is strong, recent trends indicate that employment might ultimately end up a bit lower than anticipated. The ADP Research Institute employment index for Software Developers showed that employment in these roles peaked in October 2019, and through January of 2024 declined 25.2%. The Indeed Hiring Index for Software Developers shows that job postings peaked in February 2022 and declined 72.4% from that point until April 2025.

More recently, a bit of a rebound has been observed, as job postings for Software Developers/Engineers grew 19.2% from May 2024 to April 2025. But an additional headwind can be found in the fact that Software Development job postings are shedding the bachelor's degree requirement faster than almost any other occupation, with the share requiring a bachelor's dropping from 64.4% in January 2019 to just 56.0% in January 2024.

STUDENT DEMAND

BS in Programming & Software Engineering enrollment is growing

From Fall 2019 to Fall 2024 baccalaureate enrollment in Programming & Software Engineering grew at a 5.7% CAGR.



Key Takeaways

- From Fall 2019 to Fall 2024 BS in Programming & Software Engineering enrollment grew at a 5.7% CAGR. From Fall 2023 to Fall 2024 this enrollment grew 4.6% year-over-year.
- NCES IPEDS data shows that from 2019 to 2023 BS in Programming & Software Engineering completions grew at a 7.8% CAGR.
- Software Engineering ranked as the 10th fastest growing bachelor's degree in terms of absolute volume growth over the past five years.

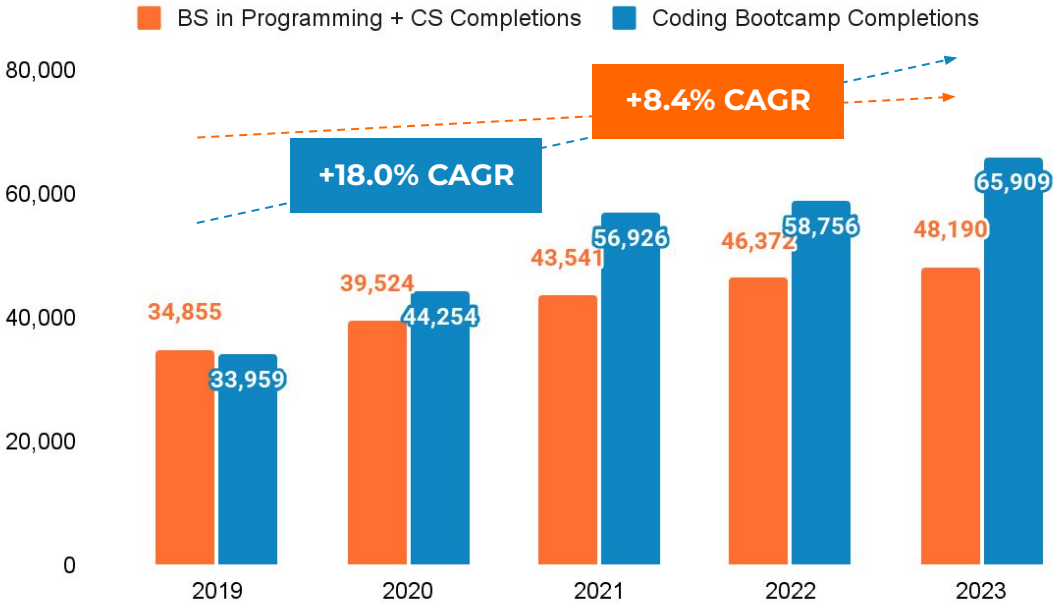
Source(s): Gray Decision Intelligence and National Student Clearinghouse (NSC) Research Center, data is for 11.02XX & 11.08XX CIP Code groups combined, data assumes all undergraduate enrollment at 4-year institutions is bachelor's-level enrollment, Validated Insights analysis

STUDENT DEMAND

Bootcamps have surpassed bachelor's degrees for developer training

Bootcamps surpassed bachelor's degrees in typical developer fields in 2020 and have continued to grow at an accelerated rate.

Trend in Common Bachelor's for Developers vs Coding Bootcamp Graduates



Source(s): Course Report and National Center for Education Statistics (NCES) IPEDS, Course Report data includes all bootcamp graduates, NCES IPEDS data includes 11.02XX, 11.07XX, and 11.08XX 4-digit CIP Code groups, Validated Insights analysis

Key Takeaways

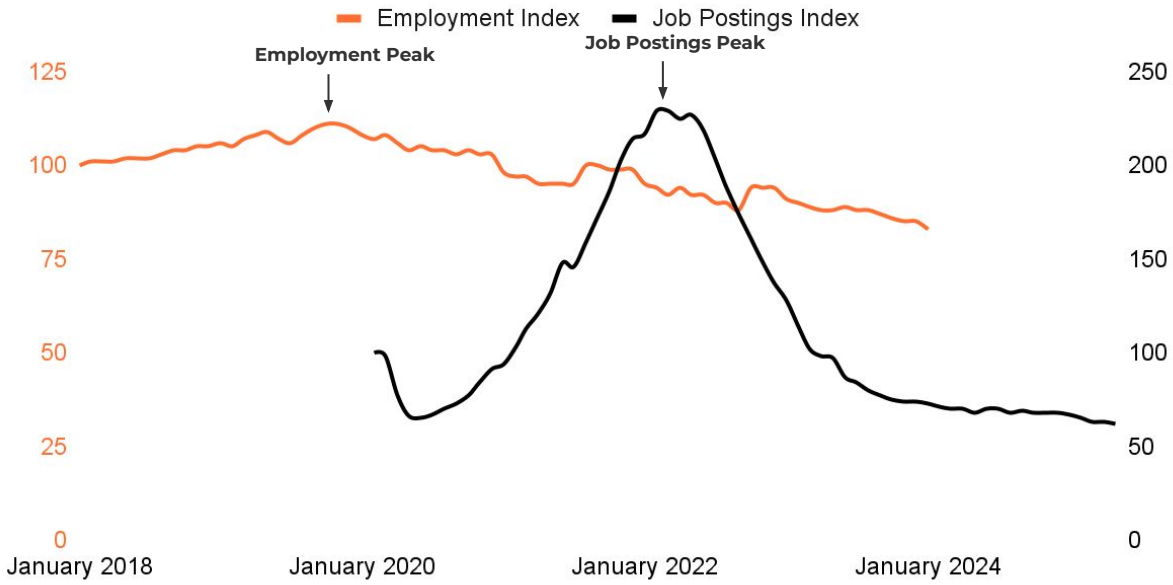
- In 2019 there were 34,855 graduates of bachelor's degrees in either Programming & Software Engineering or Computer Science. That same year there were 33,959 graduates of coding bootcamps.
- In 2020, there were more graduates of coding bootcamps than graduates of Bachelor of Programming & Software Engineering plus Bachelor of Computer Science programs for the first time, marking a significant shift in how developers are trained.
- From 2019 to 2023, Bachelor of Programming & Software Engineering + Bachelor of Computer Science completions grew at an 8.4% CAGR (7.8% for just Programming & Software Engineering) while coding bootcamp completions grew at an 18.0% CAGR.

Employment of, and job postings for Software Developers are down

Employment of Software Developers peaked in October 2019 and has declined since. Job postings peaked in February 2022 and has also declined since.

Software Developer Employment & Job Postings Indices by Month

Employment Index is indexed to Jan. 2018, Job Postings Index is indexed to Feb. 2020



Key Takeaways

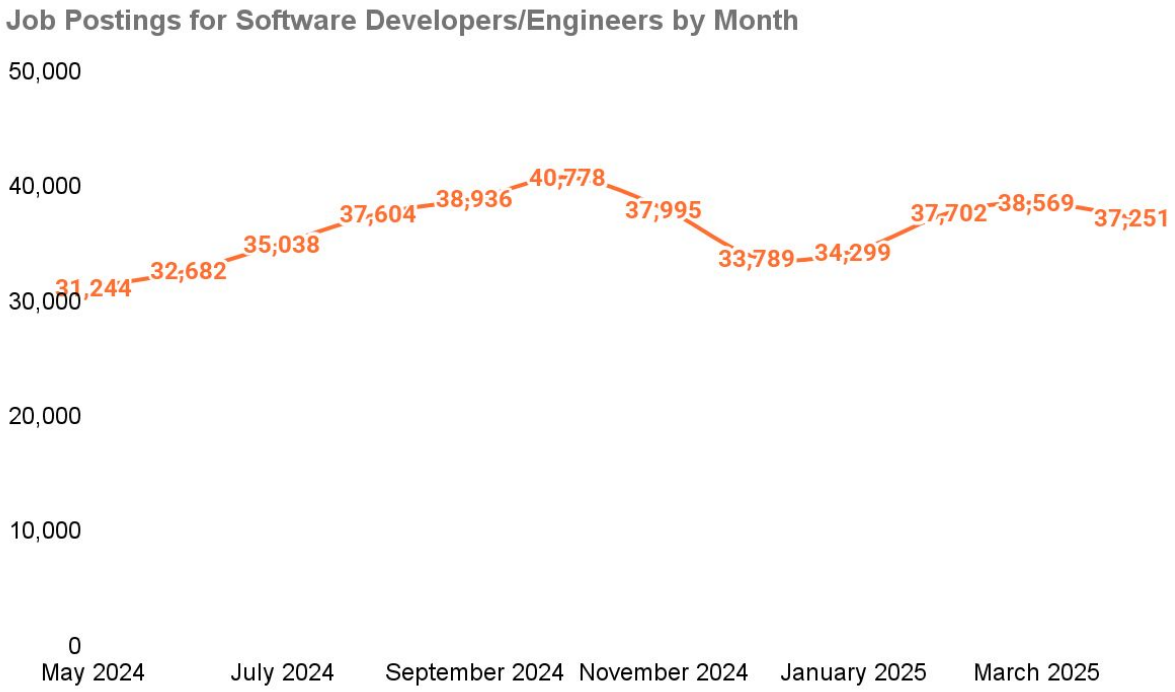
- Payroll data from the ADP Research Institute shows that employment of Software Developers peaked in late 2019. From October 2019 to January 2024 employment in these roles declined 25.2%.
- Indeed data shows that job posting activity for Software Developer roles peaked in February 2022 and declined 72.4% from that point until April 2025.

Source(s): ADP Research Institute and Indeed, note that Indeed collects data on a daily basis so the average over the course of the month is shown, ADP Research Institute only produced this index through January 2024

LABOR MARKET DEMAND

Hiring demand for Software Developers/Engineers is growing

From May 2024 to April 2025 job postings for Software Developers/Engineers grew 19.2%.



Source(s): Lightcast

Key Takeaways

- Over a longer time horizon, hiring demand for Software Developers/Engineers is down, however more recently, hiring demand is up.
- From May 2024 to April 2025 the number of job postings for Software Developers/Engineers grew 19.2% per Lightcast data. Other data sources indicate that the growth has been much more rapid, most likely owing to a difference in job taxonomies.
- Gray Decision Intelligence reports that job postings for “Software Developers, Applications” grew 147% from March 2024 to March 2025, the fastest growth in job postings over that time period among all occupations that typically require at least a bachelor’s degree.

Fewer developers need a bachelor's to get hired

From January 2019 to January 2024, the percentage of Software Development job postings requiring a bachelor's or above fell from 64.4% to 56.0%.

Percent of Job Postings Requiring Bachelor's or Above

Sector	Jan. 2019	Jan. 2022	Jan. 2024	5-Year Change (pp)
Project Management	67.3%	64.7%	58.1%	-9.2
Info Design & Doc.	65.8%	64.9%	56.8%	-9.0
Software Development	64.4%	61.9%	56.0%	-8.4
Logistic Support	33.1%	28.4%	24.9%	-8.2
Human Resources	57.4%	53.6%	49.3%	-8.1
Industrial Engineering	72.8%	70.9%	65.1%	-7.7
Civil Engineering	69.4%	68.3%	62.2%	-7.2
Marketing	48.9%	48.2%	41.9%	-7.0

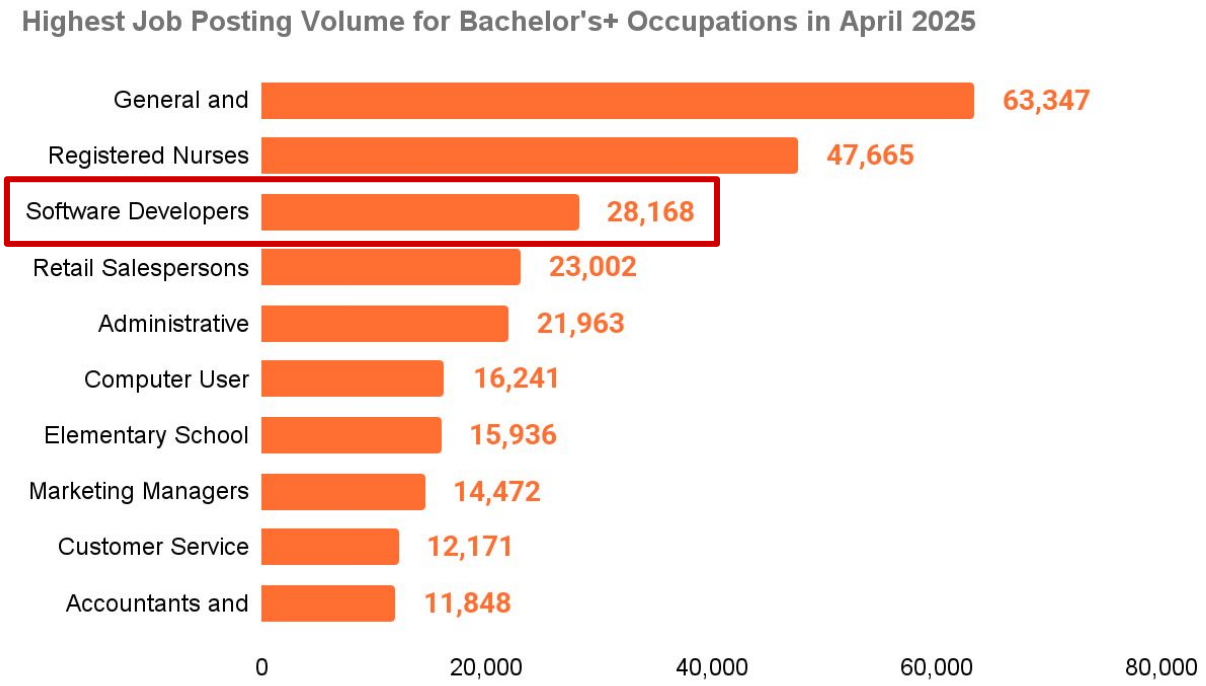
Source(s): Indeed

Key Takeaways

- While bachelor's degree requirements have been declining across the board, the decline has been particularly pronounced in a few specific sectors.
- From January 2019 to January 2024 the percentage of Software Development job postings requiring at least a bachelor's degree declined 8.4 percentage points, from 64.4% to 56.0%.
- As of January 2024, 46.5% of all Tech job postings required at least a bachelor's degree. Across all job postings the share that require at least a bachelor's degree fell from 20.4% in January 2019 to 17.8% in January 2024.

Fewer developers need a bachelor's to get hired

From January 2019 to January 2024, the percentage of Software Development job postings requiring a bachelor's or above fell from 64.4% to 56.0%.



Key Takeaways

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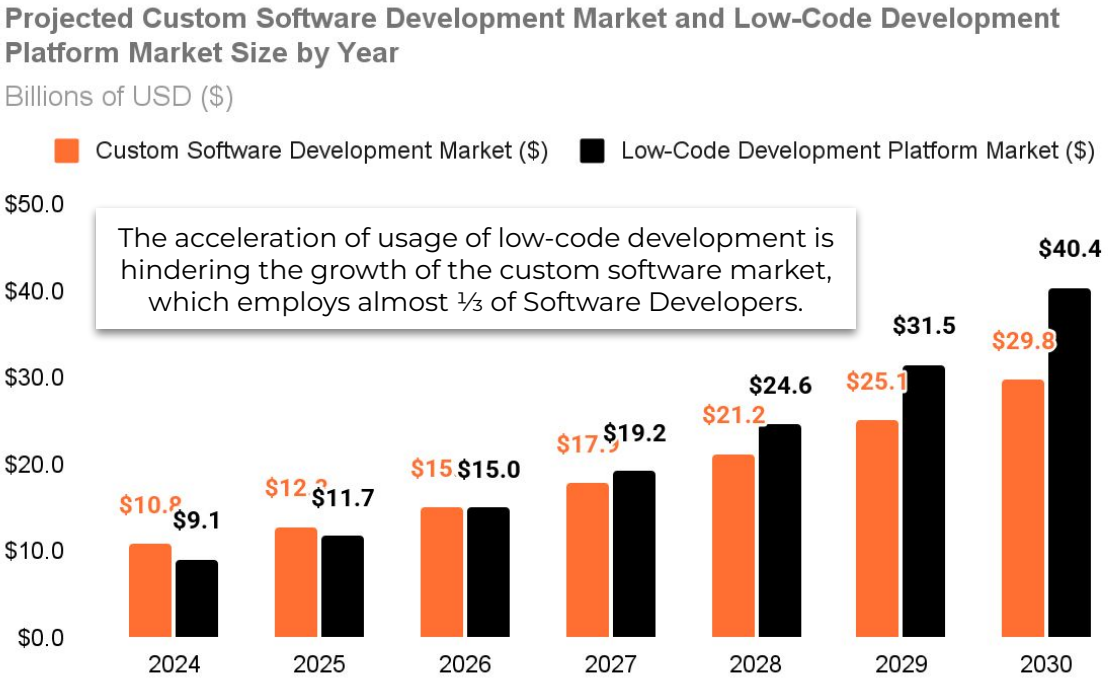
- From January 2019 to January 2024 the percentage of Software Development job postings requiring at least a bachelor's degree declined 8.4 percentage points, from 64.4% to 56.0%.
- As of January 2024, 46.5% of all Tech job postings required at least a bachelor's degree.

Source(s): Gray Decision Intelligence, chart is not showing occupations designated as ones that typically require a bachelor's degree to obtain employment but actual postings requiring a given level of educational attainment

Low-Code platforms are replacing software development companies

Low-Code platforms are projected to surpass custom software development services in terms of total revenue in the United States in 2027.



Key Takeaways

- In 2024, the custom software development market was worth an estimated $10.8B. Furthermore, companies operating in this space employed about 31% of all Software Developers in the United States.
- Also in 2024 the low-code development platform was worth an estimated $9.1B.
- From 2024 to 2030, the custom software development market is projected to grow at an 18.5% CAGR, however the low-code development platform market is projected to grow faster at a CAGR of 28.2%. This accelerated growth in the low-code development market means the market will surpass custom software development in 2027, and by 2030 the low-code market will be 35.6% larger than the custom development market.

Source(s): Grand View Research, Research and Markets, and U.S. Bureau of Labor Statistics (BLS)

The Computer Science/Information Technology Education Market

Appendix & Sources

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Appendix 1

Projected Employment by Relevant Occupation From the U.S. Bureau of Labor Statistics (BLS)

Projected Employment by Relevant Occupation

Occupation	Employment in 2023	Employment in 2033	AVG Annual Openings	Growth (%)
Software Developers	1,692,100	1,995,700	125,100	+17.9%
Computer User Support Spec.	725,300	762,500	50,600	+5.1%
Computer & Info. Sys. Managers	613,500	720,400	54,700	+17.4%
Computer Sys. Analysts	527,200	583,700	37,300	+10.7%
Computer Occ., All Other	470,900	522,000	34,800	+10.8%
Network & Comp. Sys. Admin.	335,400	326,600	16,400	-2.6%
Data Scientists	202,900	276,000	20,800	+36.0%

Source(s): U.S. Bureau of Labor Statistics (BLS)

Projected Employment by Relevant Occupation

Occupation	Employment in 2023	Employment in 2033	AVG Annual Openings	Growth (%)
Info. Security Analysts	180,700	239,800	17,300	+32.7%
Software QA Analysts & Testers	205,000	229,200	15,000	+11.8%
Computer Network Architects	177,800	201,700	12,300	+13.4%
Computer Network Support Spec.	166,700	178,800	12,100	+7.3%
Web & Dig. Interface Designers	128,600	138,800	9,900	+7.9%
Computer Programmers	139,400	126,000	6,400	-9.6%
Web Developers	94,100	102,500	6,600	+9.0%

Source(s): U.S. Bureau of Labor Statistics (BLS)

Projected Employment by Relevant Occupation

Occupation	Employment in 2023	Employment in 2033	AVG Annual Openings	Growth (%)
Database Administrators	80,500	87,100	5,300	+8.2%
Database Architects	61,400	68,000	4,200	+10.8%
Computer & Info. Research Sci.	36,600	46,000	3,400	+25.6%
CS/IT Total	***5,838,100***	***6,604,800***	***432,200***	***+13.1%***

Source(s): U.S. Bureau of Labor Statistics (BLS)

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Appendix 2

Projected Employment by Relevant Occupation From CompTIA

Projected Employment by Relevant Occupation

Occupation Cluster	Employment in 2024	Employment in 2034	Growth (%)
Software Developers & Engineers	1,716,402	2,178,042	+26.9%
IT Support Specialists	743,703	818,628	+10.1%
CIOs and IT Directors	574,137	685,226	+19.3%
Systems Analysts & Engineers	541,582	618,978	+14.3%
IT Proj. Mgmt., Emerg. Tech., Other	465,855	535,949	+15.0%
Network & Systems Admin.	334,777	364,381	+8.8%
Software QC & Testers	212,203	260,899	+22.9%

Source(s): CompTIA

Projected Employment by Relevant Occupation

Occupation Cluster	Employment in 2024	Employment in 2034	Growth (%)
Data Scientists & Analysts	179,826	240,041	+33.5%
Cybersecurity Analysts & Eng.	181,791	237,075	+30.4%
Network Architects	180,207	197,706	+9.7%
Network Support Specialists	175,653	197,007	+12.2%
Computer Programmers	146,254	143,142	-2.1%
Web & Dig. Interface Designers	116,896	139,586	+19.4%
Web Developers	105,293	124,938	+18.7%

Source(s): CompTIA

Projected Employment by Relevant Occupation

Occupation Cluster	Employment in 2024	Employment in 2034	Growth (%)
Database Administrators	82,772	92,859	+12.2%
Computer Hardware Engineers	82,609	91,726	+11.0%
Comp., ATM, Office Machine Techs.	92,826	89,257	-3.8%
Database Architects	66,239	76,469	+15.4%
Computer & Info. Research Sci.	39,302	48,962	+24.6%
CS/IT Total	***6,029,326***	***7,140,871***	***+18.4%***

Source(s): CompTIA