ChatGPT

Global Workforce in Compute Scaling vs. AI Research (1999–2019)

Overview

We compare the worldwide human labor dedicated to **(A) scaling effective compute** and **(B) understanding/building general intelligence** at five-year intervals. Category **A** encompasses all full-time equivalents (FTEs) broadly involved in improving compute performance-per-cost (from semiconductor fabrication to systems and performance engineering). Category **B** counts the much smaller cohort focused on general-purpose AI research (core machine learning theory, cognition, general reasoning), including academia and specialized AI labs. Table 1 summarizes our estimates, followed by data sources, rationale, and uncertainty discussion.

Table 1. Estimated Global FTE Counts (Category A vs. Category B)

Year	**Category A – "Compute-Scaling" FTEs** *Broad compute hardware/software workforce*	**Category B – "AI/Intelligence" FTEs** *Core AI research workforce*	**Ratio A:B**
1999	≈ **0.5 million** (range ~0.3–0.8M)	≈ **2,000** (range ~1,000–5,000)	**~250:1**
2004	≈ **0.7 million** (range ~0.4–1.0M)	≈ **3,000** (range ~1,500–7,000)	**~200:1**
2009	≈ **0.9 million** (range ~0.6–1.5M)	≈ **5,000** (range ~3,000–10,000)	**~180:1**
2014	≈ **1.3 million** (range ~0.8–2.0M)	≈ **10,000** (range ~5,000–15,000)	**~130:1**
2019	≈ **2.5 million** (range ~1.5–3.5M)	≈ **20,000** (range ~10,000–40,000)	**~125:1**

Category A – "Compute-Scaling" Workforce (Broad)

Definition & Scope: Category A includes *all* global workers whose primary work drives **better or cheaper computing capacity**. This spans the semiconductor industry (chip design, fabrication, and associated equipment/material suppliers), high-performance computing and cloud infrastructure teams, systems software and performance engineering (e.g. OS, compilers, database and distributed systems optimization), as well as supporting roles (management, operations, etc.) essential to these efforts. We also include teams in related domains like graphics engines and game console hardware (focused on maximizing compute/graphics performance), networking and datacenter hardware companies, EDA (electronic design automation) tool providers, and relevant government or national lab HPC teams. In short, it counts *all labor materially supporting the production or improvement of computing power*.

1999: We estimate on the order of a **few hundred thousand** people worldwide in 1999 were engaged in "compute-scaling" work. The late-1990s semiconductor sector was sizable – for context, global semiconductor sales were $125.6 B in 1998 [1] (about one-quarter of 2018 levels), suggesting a substantial but smaller workforce. Many major chip firms (e.g. Intel, Samsung, Toshiba, Motorola) and equipment makers were active, alongside enterprise computing giants (IBM, Sun, SGI) and software firms (Microsoft, etc.). Based on industry reports and company sizes, we approximate **~0.5 million FTEs** in 1999 (plausibly 0.3–0.8 M). As an indicator, the **U.S. semiconductor industry** alone employed on the order of **~250,000** at its peak around 2000 [2] [3], and Taiwan's nascent chip sector was smaller but growing. Including workers across Japan, Europe, and emerging Asian fabs, plus systems hardware/software firms, a mid six-figure global count is reasonable.

2004: The early-2000s saw modest growth (tempered by the dot-com bust and tech recession of 2001–03). By 2004 we estimate roughly **~0.7 million** (0.4–1.0 M) Category A FTEs worldwide. The semiconductor workforce shifted globally – the U.S. saw declines (2000s U.S. semiconductor manufacturing jobs fell ~40% by 2009 [4]) even as **Asia's workforce expanded**. For example, **Taiwan's** chip industry grew significantly post-2000; by 2010 it had ~217,000 employees [5]. Major chipmakers like **Intel** (around 85k employees in 2004, up from ~70k in 1999) and **TSMC** (tens of thousands by the mid-2000s) continued to invest in R&D and fabs. Meanwhile, systems and infrastructure firms (Dell, HP, IBM, Cisco, etc.) and enabling software engineering roles remained robust. Overall, the compute-focused workforce likely rose slightly in the early 2000s, but was still well under 1 million globally.

2009: By 2009, we estimate on the order of **~0.9 million** (0.6–1.5 M) FTEs in Category A worldwide. Several trends marked this period: the rise of **mobile computing and smartphones** (driving investments in newer chip designs and fabs), expansion of **Asian foundries and memory manufacturers**, and the initial build-out of **hyperscale datacenters**. The global semiconductor market was ~$249 B in 2008 [6], roughly flat from a peak in 2000, but with production shifting to lower-cost regions. This implies the global workforce remained in the high hundreds of thousands. The **U.S. share** had shrunk (U.S. semi employment ~180k by 2009 [3]), while Taiwan, Korea, and China increased headcount. Supporting sectors (semiconductor equipment makers like ASML, Applied Materials, etc., and enterprise hardware firms) also contributed many tens of thousands of workers. Our central ~0.9 M estimate reflects a broadly steady or slightly growing compute hardware/software labor force through the 2000s.

2014: The mid-2010s saw a **major expansion** in compute-related industries, pushing our estimate to around **1.3 million** FTEs (0.8–2.0 M) by 2014. Several factors drove this growth: **smartphone boom** (leading to new chip designs and fab capacity), **cloud computing's rise** (Amazon AWS, Google, Microsoft Azure rapidly scaling server fleets and hiring engineers), and **intensifying R&D** for performance improvements (e.g. GPUs for graphics and emerging machine learning). The global semiconductor industry revenue hit $335 B in 2014, up ~40% from 2009. Correspondingly, the worldwide semi workforce likely exceeded **~1 million** by around 2014. For instance, **Taiwan's industry** was already in the hundreds of thousands; **TSMC** alone employed ~40k+ by 2014. The **global semiconductor workforce** (design + manufacturing) can be inferred to be on this order, given that by **2021 it reached ~2 million** [7]. Beyond chips, companies like **Dell Technologies** (≈157,000 employees in 2019 [8], including its server/storage businesses) and **Cisco** (~75,900 in 2019 [9]) had large workforces supporting compute infrastructure. A significant fraction of those roles (hardware engineers, systems designers, etc.) count toward Category A. We include **major OS and systems software teams** as well – for example, Microsoft's Windows and Azure engineering groups, Linux kernel contributors funded by companies, etc. – which by mid-2010s comprised many thousands of specialized engineers globally. In sum, the compute-scaling workforce grew substantially in the first half of the 2010s, surpassing the million mark.

2019: By 2019, our estimate is about **2.5 million** FTEs (1.5–3.5 M) worldwide in Category A. This large jump reflects the **global tech boom** in the late-2010s and massive investments in computing. Notably, the **semiconductor industry** itself accounted for roughly **2 million direct jobs by 2021** [7], implying on the order of 1.5–1.8 million in 2019. (For scale, **Taiwan's semiconductor sector** alone had ~225,000 workers in 2019 [10], and the **U.S. industry ~240,000** [2], together ~465k.) Adding the **semiconductor equipment suppliers** (ASML, etc.), which employ well over 100,000 globally, and the **broader hardware/software firms** focused on compute, the totals climb into the low millions. By 2019, all major segments were at peak headcount: e.g. **Intel** (~110k employees in 2019), **Samsung Electronics** (over 100k in its semiconductor division), **SK Hynix** (~34k), **Micron** (~37k), **NVIDIA** (~13k), **AMD** (~10k) among chip companies, and tens of thousands more across Apple's silicon team, Qualcomm, Broadcom, etc. Hyperscalers had also built sizable hardware engineering and datacenter operations teams – for instance, **AWS**, **Google**, and **Microsoft** each employed many thousands of engineers on cloud infrastructure and custom hardware (TPUs, FPGA teams, etc.), as well as tens of thousands of data center technicians and support staff. When one also counts **enterprise hardware vendors** (Dell, HPE, IBM's Systems group, etc.), networking firms, console and GPU-centric teams (e.g. Sony, Microsoft Xbox, etc.), and critical support roles (supply chain, operations, research labs for HPC like national supercomputing centers), the compute-scaling ecosystem encompasses a multi-million-strong workforce. We use ~2.5 million as a central estimate for 2019. This broad workforce vastly outnumbers Category B, by roughly **two orders of magnitude** (see Ratio A:B in Table 1).

Category B – "AI/Intelligence" Research Workforce (Narrow)

Definition & Scope: Category B aims to count all FTEs globally whose primary work is **researching or developing general-purpose intelligence systems or theories**. This *excludes* most applied machine learning roles (e.g. data scientists, product-specific ML engineers, analytics), focusing instead on those advancing the **fundamentals of AI and cognition**. It includes:

- **Academic AI researchers** in universities (professors, research scientists, postdocs, and graduate students *primarily* researching machine learning theory, cognitive architectures, general reasoning, reinforcement learning, etc.). We also include teaching assistants and research assistants if their work is tied to these research programs.
- **Dedicated AI research labs** personnel (in industry or non-profits) who are explicitly working toward artificial general intelligence or core AI capabilities. Examples: staff at DeepMind, OpenAI, Anthropic, FAIR (Facebook AI Research), Google Brain, Microsoft Research AI, Mila, Allen Institute for AI, and similar groups focused on general AI advances (as opposed to purely applied product development).
- **Cognitive science & neuroscience researchers** *only* to the extent they study learning, cognition, or brain mechanisms with the aim of understanding intelligence broadly (for instance, computational neuroscientists whose work informs AI algorithms).

This category is inherently much smaller than Category A. We target those pushing the frontiers of learning algorithms and understanding of intelligence, rather than the vast numbers applying known algorithms to practical problems. By design, Category B likely numbered only in the **low thousands even as of 2010**, growing to perhaps tens of thousands by 2019.

1999: During the late 1990s, the core AI research community was in a relative lull (the "AI winter" era had only recently thawed). We estimate on the order of **~1,000–2,000** full-time researchers globally in 1999 were focused on general AI or fundamental ML theory. This includes established AI professors and their grad students, plus researchers in a few labs. For instance, the **AAAI-99 conference** (a major AI conference in 1999) had only a few hundred attendees, and the **NeurIPS** (then NIPS) conference in the late 90s was similarly small (a few hundred participants). The **entire field** of machine learning and AI was niche – well under one thousand active researchers in North America, plus additional pockets in Europe and Asia. Many university CS departments had only 1 or 2 AI faculty at the time. Therefore, a **central estimate ~2,000** FTEs in 1999 seems plausible (with a broad range of perhaps 1k–5k to allow for counting students and international researchers). This would include, for example, the roughly 150–200 attendees at major AI conferences and their colleagues not in attendance, across all countries. By comparison, this is a **tiny workforce** – roughly 0.1% of the compute workforce at that time.

2004: By 2004, the AI research world had started modest growth (e.g. early deep learning research was underway, though still a small community, and interest in areas like kernel methods was rising). We estimate **~3,000** FTEs globally (range ~1.5k–7k) in Category B for 2004. The annual **International Joint Conference on AI (IJCAI 2005)**, for instance, received on the order of a few hundred paper submissions and similar attendance. The **number of AI PhDs** graduating annually in the early 2000s was quite low (in the U.S., only dozens per year specialized in AI/ML). Leading AI labs were few (e.g. academic centers like CMU, MIT, Stanford had maybe a couple dozen researchers each; there was no DeepMind or OpenAI yet). Some growth came from related fields – for example, computational neuroscience and cognitive science conferences attracted researchers interested in learning algorithms, but these were still niche. Overall, the mid-2000s likely saw only a **few thousand** active general-AI researchers worldwide.

2009: By 2009, the AI research workforce had roughly **doubled** compared to early in the decade – we estimate on the order of **~5,000** FTEs (3k–10k) globally. Several developments contributed: the revival of neural network research (Geoff Hinton's lab and others), the rise of **"deep learning"** breakthroughs around 2006–2009 (e.g. deep belief networks), and increasing funding for AI in academia. Conference participation was climbing but still moderate – e.g. **NeurIPS 2008** had on the order of 1,000 attendees, and by 2009 perhaps a bit more. The **number of distinct authors** publishing at major AI conferences in 2009 was a few thousand at most. (For comparison, in 2018 about 22,400 individuals authored papers at top AI conferences [11], so 10 years earlier it would have been far fewer.) There were also new research groups forming in industry (e.g. Microsoft Research had an expanding ML group by late 2000s), which added to the count. Nonetheless, circa 2009 the **AI-as-intelligence research community** was still very small – on the order of only **~5×10^3** people worldwide, many of them graduate students or junior researchers.

2014: The five years from 2009 to 2014 saw *explosive growth* in category B, thanks to the **deep learning revolution**. By 2014, we estimate roughly **10,000 FTEs** globally (5k–15k) dedicated to core AI research. Key signals of this growth include conference sizes and publication counts: the **NeurIPS 2014** conference had swollen to roughly 3,500 attendees (just a few years earlier it was under 1,000). Similarly, ICML, CVPR, and other major conferences in 2014 each attracted a few thousand participants. If we consider unique individuals (many attend multiple conferences), the global pool of active AI researchers by mid-decade was likely on the order of ten thousand. Supporting data: the Element AI **Global AI Talent** analysis found ~22,000 *AI researchers* (PhD-educated or equivalent) worldwide by 2018 [11] [12] – and that was after further growth; in 2014 the number would have been lower. Additionally, in academia, AI/machine learning became the **hottest field** for new graduate students in the early 2010s: universities saw spikes in enrollment in AI-related PhDs. Industry research labs also expanded (Google Brain was founded in 2011, OpenAI in 2015, and DeepMind grew rapidly after 2014, etc.). By 2014 we also include growing ranks of **AI-focused faculty** (which had roughly doubled in number compared to 2000) and their students, and a still-small but nonzero community working on **AI safety and general intelligence theory**. Overall, our ~10k estimate for 2014 reflects a community that, while much larger than a decade before, was still *only in the ten-thousands*. The gap between Category A and B remained huge (perhaps ~100:1 ratio in 2014).

2019: By 2019, the global **AI research workforce** (Category B) had reached on the order of **~20,000 FTEs** (our range 10k–40k to account for definition). This aligns with outside estimates: for example, **LinkedIn data** in 2019 identified ~36,000 self-identified AI *professionals* worldwide [12] (though this may include some applied roles, it sets an upper bound), and an analysis of top-conference authorship found ~22,400 individuals publishing papers in 2018 [11]. Our count (~20k) is in the same ballpark, given not all conference authors are full-time researchers (some are students or industry engineers who publish occasionally). To appreciate the 2019 size: **NeurIPS 2019** had **~13,500 attendees** [13] – an all-time high – and *multiple* other major AI conferences (CVPR, ICML, ICLR, etc.) each had on the order of 6,000–9,000 attendees in 2019 [13]. While there is overlap in these communities, it indicates that tens of thousands of people worldwide were engaged in cutting-edge AI research. Major AI labs had grown to hundreds of research staff (DeepMind had ~700 researchers by 2019; OpenAI, FAIR, and others on similar orders). Academia also swelled: AI faculty hires surged and PhD programs in AI expanded in the late 2010s. (Stanford's AI Index reports North America graduated ~1,500 AI PhDs in 2018 alone, many of whom joined industry labs [14].) Importantly, our Category B definition *excludes* the much larger pool of engineers deploying AI in applications – those counted here are primarily inventing new algorithms or theories. Even generously, this core group was **well under 50,000 globally in 2019**, and likely closer to **10k–20k** if strictly focusing on "general intelligence" R&D. This is consistent with the prompt's note that Category B was *≤20k in 2019* under reasonable definitions.

Finally, we note that Category B includes a fraction of researchers in related fields (neuroscience, cognitive science) who explicitly bridge to AI. For instance, some computational neuroscientists or cognitive modelers aim to reverse-engineer intelligence – they would number perhaps a few hundred worldwide and are included in our estimate. Their inclusion or exclusion does not dramatically change the ~20k figure in 2019.

Comparison and Ratio Trends

The **ratio** of Category A to Category B workforce is striking, highlighting how much larger the effort devoted to scaling computing power has been, compared to the effort devoted to directly understanding intelligence. In 1999, we estimate **~250:1** (compute-scaling workers to AI-research workers). That ratio remained in the hundreds-to-one throughout the 2000s – e.g. on the order of 200:1 in 2004 and ~180:1 by 2009 (still roughly two orders of magnitude more people in compute hardware/software). By 2014, the ratio had narrowed to around 130:1, and by 2019 to roughly **125:1** (using our central estimates, see Table 1). In other words, for every single person working on fundamental AI research in 2019, there were well over a hundred people working to make computing more powerful or efficient.

It's worth noting that **both categories grew rapidly** from 1999 to 2019, but **Category B grew faster in percentage terms**, especially after 2010. This led to a modest decrease in the A:B ratio (from ~250→125:1). For example, the AI research headcount roughly *10×'ed* over two decades (~2k to ~20k by our estimate), whereas the compute workforce grew around *5*× (~0.5M to ~2.5M). Even by 2019, however, the **compute-scaling workforce** was about *two orders of magnitude larger*.

This reflects how **labor-intensive and broad** the computing ecosystem is – spanning huge factories, engineering teams, and infrastructure – compared to the relatively **small, specialized community** pushing the frontiers of AI algorithms. Another perspective: in 2019, the semiconductor industry alone had about 2 million workers [7], whereas a generous count of all AI algorithm researchers might be ~0.02 million – a 100:1 difference. Put yet another way, the world had perhaps **a few *dozen*** people working on making computers *think* (in a general sense) for every **several thousand** working on making computers *run faster*.

Key Uncertainties and Assumptions

Definitional Choices (Who Counts?): The above estimates are sensitive to how we draw boundaries around each category. For **Category A**, we adopted a broad inclusion – effectively counting entire companies or divisions oriented toward advancing compute. This means, for example, that all employees at a chip manufacturer (from R&D engineers to fab technicians, to sales and support staff) contribute to "scaling compute" and were counted. If one chose a narrower definition (e.g. counting only technical R&D roles, or excluding support staff), the numbers would be lower – potentially by a factor of ~2 (since many in those firms are in support or non-technical roles). We included support roles on the rationale that without them the compute ecosystem doesn't function or grow. However, one might argue the **"effective compute" workforce** should exclude, say, retail PC assembly or generic IT services, which we did not count anyway. We also included some domains (e.g. video game engine developers, console hardware teams) that border on "application" – but their work substantially centers on optimizing performance, so we kept them in Category A. If these were excluded, the impact would be relatively small (perhaps tens of thousands fewer in the total).

For **Category B**, the biggest definitional issue is *whom to exclude*. We **excluded** the legions of developers using AI tools in specific applications (finance, marketing, etc.), focusing only on those pushing the research frontier of AI **general capability**. In practice, the line can blur – e.g. is a computer vision researcher working on ImageNet algorithms part of "general intelligence" research? We leaned toward inclusion if the work informs general learning methods, even if in a specific domain (vision, language). Conversely, an ML engineer tuning a model for ad ranking was excluded. Our ~20k estimate for 2019 assumes a relatively **strict filter** – if one instead counted *all* "AI/ML engineers" globally, the number would shoot into the hundreds of thousands or more (for instance, LinkedIn showed **~36,000 self-identified AI specialists** even by 2019 [12], and AI-related job postings were tens of thousands [15]). We tried to count only those in **research roles** (including PhD students, since they effectively work full-time on research). There is uncertainty on whether to include adjacent fields: e.g., are pure mathematicians working on AI theory counted? (We effectively did if they publish in AI venues.) What about cognitive psychologists studying human reasoning? (Likely not, unless directly tied to AI models.) These judgment calls introduce ambiguity, but likely on the order of a few thousand heads at most. We also count each graduate student or faculty as ~1 FTE regardless of time spent on teaching vs research, assuming their **focus** is AI research. If we were to count only "paid professional researchers" and not students, the numbers would be lower (perhaps by 30–40%, since many in Category B are grad students). We chose to include them as they are integral to research output (and the prompt explicitly listed students and TAs).

Data Gaps and Estimation Uncertainty: For **Category A**, we lack precise global employment data for many subsectors, so we triangulated from partial indicators (company headcounts, industry revenues, etc.). This introduces substantial uncertainty (hence our wide ranges). For example, the **global semiconductor workforce** number (≈2M in 2021 [7]) is one solid anchor, but how much of the broader IT hardware/ software workforce should count is debatable. We likely *overestimate* Category A if some of those workers are not truly focused on improving compute *performance*. For instance, Dell's 157k employees include many in sales, customer support, etc. – we count them since they enable the compute ecosystem, but a stricter view might only count, say, Dell's R&D and manufacturing staff (~50k) as "scaling compute". On the other hand, we might *underestimate* Category A because we did not explicitly include all **government and defense** workers focused on supercomputing. Agencies like DOE national labs, NASA, etc., employ thousands of HPC specialists; adding those would increase Category A slightly. Our ranges (often spanning a factor of ~2) reflect these ambiguities. Overall, an order-of-magnitude confidence for Category A is reasonably high (certainly on the order of 10^5 to 10^6 in earlier years and 10^6 in later years), but the exact multiples could shift with different cut-offs.

For **Category B**, we have better signposts (conference attendance, publications) but still considerable uncertainty. One uncertainty is **how to value part-time researchers** or those on the fringes. For instance, a professor who spends 50% of time on AI research and 50% on unrelated work – do we count them fully? We effectively counted people, not weighted FTE-hours, so some marginal overcounting may occur. Another uncertainty is **geographic and sector coverage**: our estimates rely heavily on visible academia and corporate labs, mostly in the US, Europe, and parts of Asia. It is possible we undercounted emerging regions (e.g. 2019 saw growing AI research communities in China, which by some measures was approaching parity with the US in number of papers). If China had, say, several thousand AI researchers by 2019 (as suggested by publication counts), we have included that in the ~20k, but if that surge was larger than thought, the true number could be nearer our upper bound (30–40k). Similarly, there is some overlap between Category A and B in rare cases (e.g. an AI researcher at Google who also contributes to scaling hardware – we counted them in B since that's their primary work). But double-counting is minimal given the categories' distinct focus.

Alternate Assumptions: Under reasonable alternate assumptions, the estimates could shift as follows: If one assumes a **narrower Category A** (only technical roles in core compute companies), the 2019 number might drop to ~1–1.5M (and earlier years proportionally lower), which would raise the A:B ratio a bit less (perhaps ~50:1 in 2019 if Category B is unchanged). Conversely, counting every IT professional who *indirectly* supports computing (like all software engineers, including those not focused on performance) would balloon Category A to many millions – but we explicitly did *not* include general software/IT jobs like web development. For Category B, if one were very strict (counting only those publishing in top AI conferences), the 2019 count might be closer to ~10k (indeed only ~9,000 distinct authors at NeurIPS 2019, for example). In that case, the ratio for 2019 would be ~250:1 – similar to 1999 levels – meaning the relative gap hadn't narrowed. On the flip side, including *all* folks with "AI" in their job title (the broad LinkedIn view) could push 2019 Category B toward ~30k+, yielding a ratio closer to ~80:1. We chose a middle ground, but these scenarios show an uncertainty of roughly a factor of 2 either way for Category B in 2019. The trend (dramatically more compute workers than AI researchers) holds under any reasonable assumption – only the precise ratios shift.

Conclusion: Even allowing for uncertainties, it's clear that **Category A (compute-scaling)** has been and continues to be **orders of magnitude larger** than **Category B (AI-intelligence research)**. In 2019 roughly millions vs. tens of thousands of FTEs were devoted to the respective endeavors. The gap narrowed slightly as AI research surged in the 2010s, but remains very large. This has implications for the rate of progress: compute capabilities have a vast industry propelling them, whereas our scientific understanding of intelligence is advanced by a comparatively tiny community [16] [11]. The estimates above, grounded in industry reports and surveys, underline that disparity while also charting the growth in both categories. As we look beyond 2019, one might expect Category B to continue growing (the AI boom attracting more talent), but Category A may grow as well (e.g. **projections of needing 1M+ additional semiconductor workers by 2030** [7]). How this ratio evolves will depend on investments and interest in AI *versus* the continued expansion of computing infrastructure – a key dynamic for the coming decades.

Sources: Official industry reports and surveys were used where available. Notably, Deloitte reports ~**2 million** worldwide direct jobs in the semiconductor industry by 2021 [7]. The Taiwan Institute of Economic Research reports **Taiwan's chip workforce at 290k in 2021 (225k in 2019)** [10], and CSET estimates **~240k U.S. semiconductor workers (late 2010s)** [2]. Company filings provided headcounts for major compute firms (e.g. **Dell 157k in 2019** [8], **Cisco ~75k in 2019** [9]). On the AI side, Stanford's **AI Index** and Element AI's **Global AI Talent** reports provided figures: ~**22,000 active AI researchers in 2018** (based on publications) and **36,000 LinkedIn AI professionals in 2019** [11]. Conference statistics confirm the surge: **NeurIPS 2017 had 8k attendees** [17] and **NeurIPS 2019 grew to 13.5k** [13], with similar thousands at ICML, CVPR, etc. These sources, combined with historical data on industry size and academic employment, form the basis for our estimates and their rationale.

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