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# The PHDS & Masters Shortage

# AI's Talent Bottleneck: Why PhDs Matter More Than Ever

## The Missing Scientists at the Frontier of AI

Artificial Intelligence is evolving at breakneck speed. From generative models redefining creativity to breakthroughs in robotics, natural language, and drug discovery, the next decade will be shaped by the labs building this future: OpenAI, Anthropic, Google DeepMind, Meta, xAI, Perplexity, and hundreds of well-funded startups.

But there's a catch: **the future of AI rests on scientific expertise.** Not just engineers, but PhDs and Master's graduates in Computer Science, Mathematics, Physics, Data Science, and related fields.

AI models might start with image recognition or object classification, but to push into verticals like healthcare, law, or physics, they require scientific domain expertise. PhDs bring that expertise. A physics PhD can guide AI models to simulate quantum interactions; a medical researcher can design algorithms that align with clinical workflows; a legal scholar can train models to respect the nuances of case law. Beyond their subject matter knowledge, they also contribute the mathematical rigor and research mindset needed to design novel architectures and push global AI forward: *The Mathematics of Artificial Intelligence*.

In the U.S., researchers awarded around 57,862 science & engineering doctorates in 2023, according to the NSF report. That sounds like a big number, but it's not enough. The White House AI Talent Report shows that the demand for highly specialized AI work is growing even faster than the supply. And right now, this talent is in dangerously short supply in the U.S. and Europe.

Executives everywhere face the same question: **Where will the next generation of AI researchers come from to drive these breakthroughs?**

**The answer may surprise you: Latin America** — home to a growing pipeline of PhDs and Master's graduates ready to fuel the world's leading AI labs.

# Why Advanced Researchers Are Key to AI's Next Leap

AI progress isn't just about more computing power — it's about deeper expertise. Today's models can handle broad tasks, but pushing them into specialized domains requires PhDs and Master's graduates who bring cutting-edge knowledge.

## These researchers are essential for:

- ✓ Developing new model architectures that push beyond today's limitations.
- ✓ Applying mathematical rigor to solve optimization and efficiency challenges.
- ✓ Conducting theoretical physics-level research to simulate intelligence at scale.
- ✓ Applying domain expertise (medicine, law, physics, biology, etc.) to translate industry-specific challenges into AI solutions.
- ✓ Designing experiments and curating high-quality datasets, applying the scientific method to ensure valid and reproducible results.
- ✓ Embedding ethics, safety, and governance — increasingly critical under frameworks like the EU AI Act.

These are not skills you pick up overnight. They require years of training in scientific disciplines. That's why job postings demanding AI expertise and advanced degrees have surged, with employers prioritizing PhDs and Master's graduates in computer science, data science, physics, and related fields.

And the market value is skyrocketing: top AI researchers now command multi-million-dollar packages at Big Tech firms, with total compensation often reaching the high six figures to over a million dollars annually.

# The U.S. Shortage

**The U.S. PhD pipeline is nowhere near enough to meet demand.**

- ✓ In 2023, U.S. institutions awarded 57,862 science & engineering doctorates, according to the [National Science Foundation](#).
- ✓ Of these, fewer than 3,000 were in Computer Science, with Physics and Math together adding just over 4,000 more.
- ✓ The EU shows similar constraints: Germany graduates ~30,000 PhDs yearly across disciplines, France ~16,000, but only a fraction are in AI-critical fields.

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And retention is a challenge. Many U.S. PhDs are international students — nearly 50% of Computer Science doctorates in the U.S. [are awarded to non-U.S. citizens](#). Visa backlogs and stricter immigration policies mean a significant portion leave after graduation.

In Europe, the [European Commission has flagged shortages of ICT specialists](#) as a structural risk to growth.

**The result: open roles remain vacant, projects slow down, and costs skyrocket.**

# LatAm – The Overlooked Powerhouse

Latin America is rarely mentioned in the global AI talent conversation. But it should be.

## Academic Output by Country

### 📁 BRAZIL

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- ✓ Awards ~20,000 PhDs per year (CAPES/MEC).
- ✓ Strong in Computer Science, Math, and Physics.
- ✓ USP and Unicamp consistently rank among the top 200 universities globally.
- ✓ Brazil is the 14th largest producer of scientific papers worldwide.

### 📁 MEXICO

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- ✓ Produces ~3,000 PhDs annually.
- ✓ UNAM is among the top 100 global universities for research output.
- ✓ Known for strengths in applied math and engineering, increasingly relevant for AI and robotics.

### 📁 ARGENTINA

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- ✓ ~2,500 PhDs annually, many supported by CONICET, one of the largest research councils in the world.
- ✓ UBA is top-ranked in Latin America and has partnerships with MIT, Harvard, and ETH Zurich.

### 📁 CHILE

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- ✓ ~1,000 PhDs annually, with PUC Chile and Universidad de Chile ranking in the global top 150.
- ✓ Strong hubs in machine learning and robotics.

Collectively, **Latin America graduates over 25,000 PhDs and hundreds of thousands of Master's students annually**, many in AI-critical fields. The region is also showing stronger scientific contributions in niche domains like astrophysics and high-energy physics, measured by recent metrics on publications, citations, and active researchers.

## INTERNATIONAL COLLABORATIONS

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LatAm universities are not isolated. They have deep ties to global research:

- ✓ **USP collaborates with Stanford and MIT** in AI and robotics projects.
- ✓ **UNAM partners with UC Berkeley** in computer science research.
- ✓ **CONICET** maintains joint projects with the Max Planck Institute and Oxford.
- ✓ **Chilean universities** participate in European Horizon programs for AI ethics and governance.

This is world-class talent, already plugged into the global research ecosystem.

# Why LatAm Talent Is a Strategic Fit for Global AI Labs

For executives making high-stakes talent decisions, LatAm offers four critical advantages:

1

## SCALE AND COST-EFFECTIVENESS

Hiring a PhD researcher in Brazil or Argentina costs 30–50% less than in the U.S. or Europe, while offering globally competitive compensation locally.

2

## TIME ZONE ALIGNMENT

Brazil, Argentina, Mexico, and Chile operate within 1–3 hours of U.S. EST. Collaboration feels natural, unlike with Asia or Eastern Europe.

3

## GLOBAL-READY SKILLS

LatAm PhDs are fluent in English and have international experience. Publications in leading journals (IEEE, ACM, Nature) are common.

# Data Snapshot LatAm Talent Pool

Note: figures are approximate and based on the latest available data (2023/2024).

COUNTRY	PHDS PER YEAR	MASTERS PER YEAR	STEM SHARE	NOTABLE UNIVERSITIES
Brazil	~20,000	~70,000	High	USP, Unicamp, UFRJ
Mexico	~3,000	~25,000	High	UNAM, Tec Monterrey
Argentina	~2,500	~20,000	Strong in Physics & CS	UBA, Conicet
Chile	~1,000	~10,000	Strong in ML & Robotics	PUC Chile, U. Chile

Sources: [CAPES](#) (Brazil), [CONACYT](#) (Mexico), [CONICET](#) (Argentina), [CNED](#) (Chile).

# The Business Case for LatAm Hiring

This is not about offshoring. It's about accessing high-quality, underutilized research talent that directly supports global AI innovation.

 **Faster hiring cycles:** PhD and Master's pipelines in LatAm are less saturated, reducing time-to-hire for specialized roles.

 **Enterprise-grade quality:** Researchers are trained in global standards, often with U.S./EU collaborations and publication records in leading journals.

 **Strategic resilience:** Diversifying hiring beyond the U.S./EU protects against talent bottlenecks.

For executives, this translates to: lower cost, faster execution, and greater capacity to drive frontier breakthroughs.

# How Athyna Unlocks LatAm's Scientific Potential

Accessing this talent requires more than a LinkedIn search. Scientific researchers are a scarce resource — and vetting for expertise, fit, and retention is critical. That's where Athyna comes in.

## Curated Pools



We maintain deep networks of highly qualified PhD and Master's graduates from top universities across Brazil, Mexico, Argentina, and Chile. Each candidate is pre-vetted for academic excellence and global readiness.

## Speed to Hire



Companies can interview advanced researchers in days, not months, ensuring critical AI projects move forward without delay.

## Cost-Efficient Scaling



Build world-class research teams at 30–50% lower cost than U.S./EU hires, while offering competitive local compensation.

## Support & Retention



From onboarding through benefits alignment, we ensure researchers stay engaged and deliver long-term impact.

For executives, this means focusing on strategy and breakthroughs, while we handle the complexity of finding and supporting the scientists who will power the next decade of AI innovation.

# The Future of AI is Global

The next breakthrough in AI might not come from Stanford or Cambridge. It could just as easily emerge from São Paulo, Buenos Aires, or Mexico City.

Latin America has the scale, the quality, and the connectivity to become a critical hub for global AI research. The real question is whether your company will act now to tap this resource, or be left fighting for an ever-shrinking pool of U.S. and European PhDs.

**At Athyna, we believe the frontier of AI will be written globally.** Our mission is to connect you with the researchers who will write it, and make Latin America your competitive edge.

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[www.athyna.com](http://www.athyna.com)

[hello@athyna.com](mailto:hello@athyna.com)