

Fantastic CS PhD Opportunities and Where to Find Them

How to Prepare for it (and Beyond)

Bohan Lyu
bohanlyu.com

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Outline

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- Research Experience
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① My Stories

Background

Research Experience

Key Takeaways

② Elaboration on the ‘Requirements’

③ Why (CS) PhD?

④ Takeaways

Background Overview

- Dual Major in Computer Science and Economics
- GPA: 3.9 (3.87 specifically but nobody cares)
- Publication: 3 first-author papers accepted (1 is enough) + 1 co-first-author paper under submission but influential
- Letter: 1 from Princeton + 1 from UCSD + 1 from industry (no “Big Four”)
- Direction: ML, NLP (AI4Math, Agents)
- Proposed Future Direction: Weak-to-Strong Generalization, Scalable Oversight

Research Experience

- **2023.07**

- **Finance internship** — tried it, not for me
- Joined **THUNLP**; being randomly assigned to *Agent* direction
- Read a few papers and thought: *“What the hell is that? this counts as CS research?”*

- **2023.09 – 2024.02**

- Combined with finance internship experience $\Rightarrow$ developed my **own idea**; started executing
- **2024.02** Submitted to ACL 2024 but got **Rejected**
- Revised and resubmitted over several rounds in a year
- **2025.05** Finally accepted at **ACL 2025 Main**
- *Retrospective*: The core idea holds up well in hindsight. The problem was **framing** — how I positioned the work, what I emphasized, and most importantly, **WRITING**.

- **2024 Spring**

- Started a highly **ambitious** project at THUNLP
- *Too* ambitious — Worked on it for a full year through **2025 Spring** — **ONE YEAR WASTED**
- Applied for Summer research internships.

Research Experience

- **2024 Summer:** Visited **UCSD**.
 - **Failed** to submit to **ICLR 2025** (deadline: late Sept).
 - Revised & submitted to **ICML 2025** (late Jan) and got **accepted**.
- **2025.02:** Co-authored a paper with friends and got **accepted** at **EMNLP 2025 Main**, which helped one of my friends get a PhD offer from PKU after being rejected by the THU SZ MS program.
- **2024.11 - Now:** Remote internship at **Princeton**.
 - **2024.11:** Joined **Princeton** group. Co-authored V1 project (**COLM**) and co-first-authored V2 project (Under submission during PhD application).
 - **2025 Spring:** Chose to continue with Princeton for summer. Visa complications — had to stay in **Beijing** the whole summer. Produced results by **mid-July**; momentum faded after that. No more papers after that.

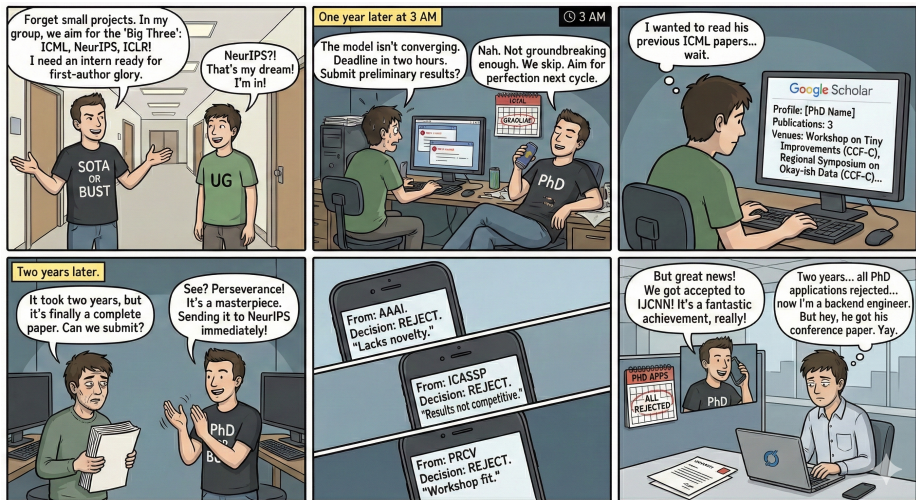
‘Academic Scam’ Experience



Reflection: The halo effect we have for “Big Four” schools is way too strong, blinding us to the fact that real research is a gradual, step-by-step process. *How much would you like to pay for a possible internship opportunity at ‘BIG-4’?*

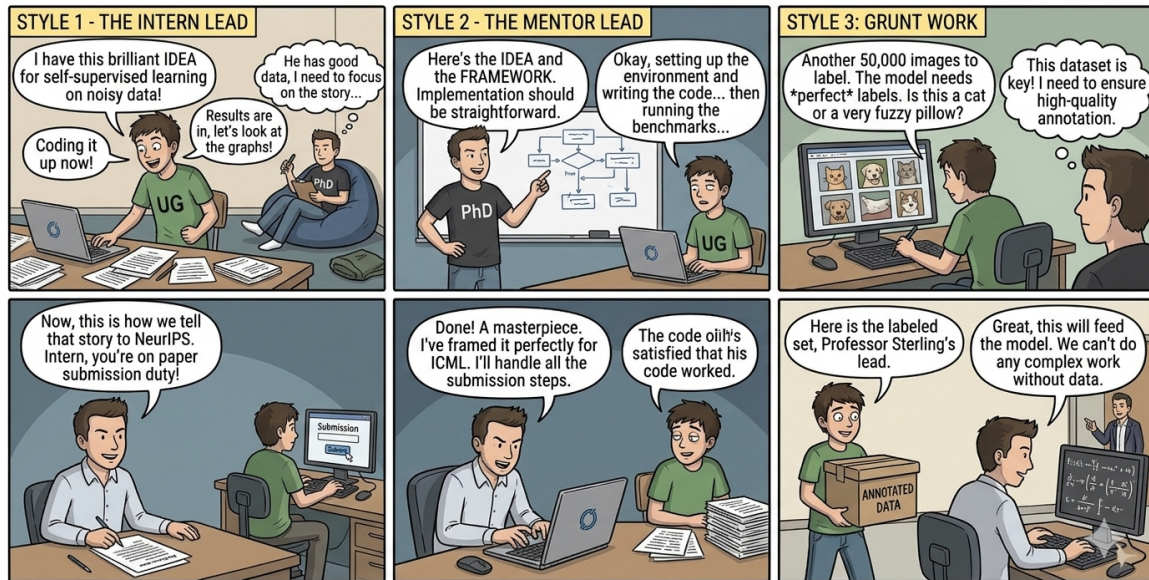
Google Scholar your prospective mentor!

What Really Matters in Research Mentorship

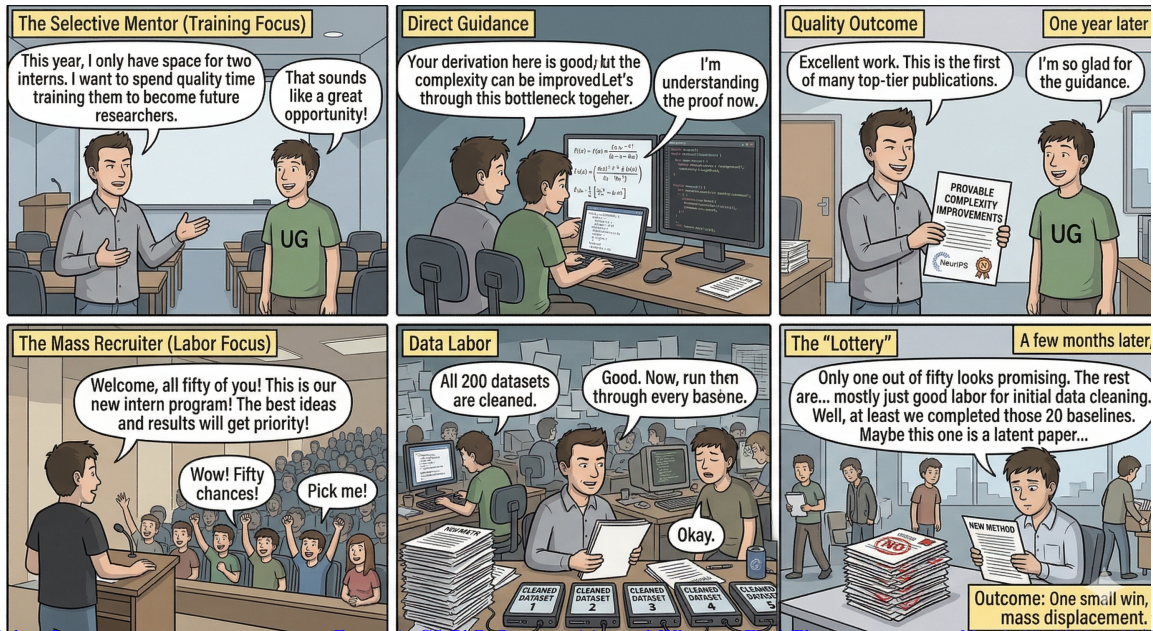


Your direct mentor is the (only) one who matters.

Different Mentorship Styles



Different Internship-Recruiting Logics



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What Counts in a Paper?

- **Acceptance ?**
- **Influence !**
- **Authorship !**
- **Match !**

The Undergraduate Research Landscape

The research environment for undergrads has been deteriorating — Faculties are leaving :(

Two pieces of advice on navigating this:

Advice 1: Find a Reliable Direct Mentor

- When you join a lab, the person who *actually* mentors you day-to-day is often a **PhD student or postdoc** — not the PI.
- Publishing on top venues is currently trivial but it’s still hard for someone.
- If they haven’t broken into top venues in their *own* field after several years, they cannot get you there.
- Your goals are **not** the same:
 - If your goal is internal grad school admission: slow progress is fine — take your time.
 - If you want a **competitive PhD application**: undergrad years are finite and precious.
 - If you are randomly assigned a weak direct mentor — **leave**.

Advice 2: Do the Real (Hard) Work

- Aim for **first-author** or **co-first-author**. Don't just collect honorary authorship credits.
- *Counterexample 1:* I know someone listed as 3rd author (behind two co-first authors). In interviews, they couldn't coherently explain their own contribution. One question and they were completely exposed.
- *Counterexample 2:* A friend was listed on one of my papers. The night before a critical interview, I walked them through every detail of the paper. The interviewer asked specifically about the **rebuttal**.
- The lesson: if you can't defend the work in depth, the authorship credit works against you.

Undergraduate Research: Luck, Variance, and the Point of It All

- Undergraduate research always involves risk. Papers may not get accepted for reasons outside your control. Luck is a huge factor — don’t underestimate it.
- **What matters is your choices and how you adjust.**
- With two years of research time in undergrad, you can realistically do 4–5 stints.
 - We all know that averaging over a distribution reduces variance: $\text{Var}\left(\frac{1}{n} \sum_{i=1}^n X_i\right) = \frac{\sigma^2}{n}$.
 - If 1–2 stints go poorly, it’s probably luck.
 - If *every* stint goes poorly — that’s your problem to reflect on.
- **The deeper point:** undergraduate research training — or rather, *struggling* — is itself preparation for a PhD.
 - A PhD is not a continuation of coursework. It is sustained, unstructured problem-solving under uncertainty — and you are expected to produce research and publish from day one.
 - Nobody teaches you how to do this when you arrive. Advisors recruiting PhD students generally *expect* you to already have a feel for it.
 - Actually, some PhD students are mentoring interns before they figured it out themselves.

Reference Letter (Connection)

- Three strong recommendation letters is the standard baseline. — Yuezhou Hu
- **Key insight:** understand the cultural and linguistic gap between Chinese and American communication. Chinese culture (and language) tends toward understatement. Academic recommendation culture in the US does not.
- Classic illustration:
 - “*How are you?*” $\Rightarrow$ “I’m good” = mediocre; “I’m great” = decent; “I’m fine” = actually struggling
- What makes a letter **weak**: not outright negativity, but **blandness**. A lukewarm letter — filled with generic phrases and little substance — is a silent negative signal.

Reference Letter (Connection)

- I once asked my recommenders: does a letter only matter when there's a personal connection? They all said no — but personal connections *do* matter, especially at the margin. However, **all the best opportunities only arise at that margin.**
- **The trust problem:** many domestic Chinese professors have students ghostwrite their own letters — overseas professors know this, so they discount them accordingly.
- If the target overseas prof *personally knows* your recommender (as advisor, classmate, or former student), it can be a huge boost.
- Direct follow-up inquiries from professors to your recommenders are common.

GPA, TOEFL, and Cold Emails

- **GPA:** Being above the threshold is sufficient. Application systems typically display GPA to one decimal place anyway. Don't over-optimize.
- **TOEFL:** On the 120-point scale, a score of 100+ clears the bar for most programs.
 - Exception: UIUC requires a 24 on speaking for some programs (for reasons unclear to me).
 - The exam format is changing in 2026 — but the advice stays the same: just clear the bar.
 - **Timing:** Don't burn your sophomore winter break on TOEFL prep. That time is worth far more spent on research.
- **Cold emails:** Largely ineffective. Don't count on them.
 - Most professors at top programs receive hundreds of templated cold emails per cycle and filter them out.
 - A strong application package speaks louder than any email.

Timeline: Conferences & Applications

Conference Deadlines & Notifications

Venue	Submission	Notification
ICLR	Sep – Oct	Jan
CVPR	Nov	Feb – Mar
ICML/ACL	Jan – Feb	May
ICCV/ECCV	Mar	Jul
NeurIPS	May	Sep

PhD Application Cycle

Dec 1–15	Submit applications
Jan	Interviews
Early Feb	Offers released
Apr 15	Decision deadline

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Industry is Compelling

Common Myths

Why PhD Still Matters

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2025: A Wild Time

- More people from academia are heading into industry: professors on sabbatical, senior PhD students graduating early, junior PhD students dropping out.
- The question is obvious: why continue a five-year (LLM) PhD when so many senior students are rushing into industry?

This section is based on Ruiqi Zhong's blog post "Is a PhD on Language Models Worth it in 2025?" (Mar 2025).

Well-Known Reasons for Industry

- **Resources:** Better compute, proprietary data (e.g., user feedback), and infrastructure (e.g., RL pipelines running on 1K GPUs).
- **Direct impact:** Industry research is more likely to reach users through products.
- **Compensation:** Total compensation for a junior researcher can range from \$400K to \$1M+.

These are real. They are hard to argue against.

Common Myths

- **Myth 1:** “Industry research is less innovative.”
 - Reality: scaling laws (OpenAI); ICL (OpenAI); CoT (Google); Constitutional AI (Anthropic)
 - Caveat: paradigm shifts tend to happen *in industry after the PhD*, not during it.
- **Myth 2:** “Academia optimizes long-term; industry is short-term.”
 - Reality: some labs are very forward-looking (e.g., (super)alignment teams).
 - Caveat: many longer-term programs are unstable — the OpenAI super-alignment team **has vanished**.
- **Myth 3:** “Finishing a PhD is the most effective path to industry research.”
 - Reality: AI residency (Google, Meta), MATS → Anthropic, or just apply directly. PhD is not a hard requirement.
- **Myth 4:** “Industry doesn’t care about efficiency — they have all the compute.”
 - Reality: LoRA, GQA, better scaling laws, ... Cheaper inference **directly improves profit**.

Reason 1: Brand-Building and Credit

- As a PhD student, you generally have **full freedom to publish** your research.
- Publications build your personal reputation — allowing hiring managers and faculty search committees to evaluate you clearly.
- In industry: papers may have hundreds of authors, making credit assignment unclear. Some work is *never* published due to competitive pressure.
- **The PhD is the clearest vehicle for building a personal research identity.**

Reason 2: Soft Skills and Safe Exploration

- PhD programs cultivate skills often de-emphasized for individual contributors in large teams:
 - Writing papers; giving talks for external audiences; pitching your research agenda at a conference
- PhD programs are educational by design: exploration at lower risk is the point.
 - You can pursue ideas outside your expertise without worrying about delivering results.
 - In industry, a failed project may affect performance reviews.
- **Caveat:** LLM research does not have a steep learning curve — 5 years can be overkill. In many cases, 2–4 years are sufficient to learn independence and publish representative work.

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Most Important Points

- **Your direct mentor is the (only) one who truly matters.** The PI's name on the door is less important than the person who will actually work with you, read your drafts, and push your thinking.
- **Undergraduate research involves enormous luck — and that's fine.** You have 4–5 stints over two years. A few failures are noise. A consistent pattern is signal. What matters is that you keep choosing, keep adjusting, and keep going.
- **Choose your research direction carefully.** Don't blindly follow the LLM (or ...) hype. A PhD takes 4–5 years — think about where the field will be when you graduate, not where it is today. **Look forward!**

We Are All Peers

“We are all peers. The difference between the most capable person and the least is much smaller than the vastness of our collective ignorance.”

— Chris J. Maddison, *Beliefs*

I'd put it this way: **the gap between any two of us is far smaller than the gap between all of us and where we want to go.**

Be open. Share what you know. Ask for help without embarrassment.

“Believe in people and try to accelerate their personal mission. When you let someone in to your life, go all-in. Work hard to help them achieve their personal mission.”

— Chris J. Maddison, *Beliefs*

I am happy to help, to the best of my ability. Feel free to reach out!

Thank You

Good luck to everyone!

Bohan Lyu
bohanlyu.com