Andrew Liu

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Key Info and Education

Harvard University, Cambridge, MA — **Class of 2023**

- Ph.D. Bioinformatics and Integrative Genomics.
- Fellow, Emerging Leaders in Biosecurity (ELBI), Center for Health Security, Johns Hopkins University, 2021 (selected as one of 30 fellows worldwide based on contributions to pandemic preparedness).

Harvard University, Cambridge, MA — **Class of 2015**

- S.M. Computer Science. GPA: 3.92. A.B. Math. GPA: 3.81. *Phi Beta Kappa* and *John Harvard Scholar* (top 5%).
- Five-time Teaching Fellow: Deep Learning for Biomedical Data, Machine Learning, Econ. and Computation, etc.

Selected Work Experience

Research Scientist (AI-bio agent evaluations lead), SecureBio/MIT – Cambridge, MA — **Jan 2024-Present**, Full-time

- Co-lead development of world's first biosecurity agent evaluations, which assess AIs' ability to *do* biology research (on top of their factual *knowledge*). Built scoring software and prompting on top of UK AISI's Inspect and used this to evaluate mainstream frontier LLMs. Developed and validated in-house LLM auto-grader, which reduced team's manual evaluation workload. Work has been featured in Claude 4 and 3.7 Sonnet System Cards.
- Manage team of 3 to efficiently collect and score 100+ 5-hour-long human baselines (important for interpreting eval results), and to develop World-Class Biology benchmark.
- Led grant-writing, project management, and client relationship activities for 3 expert biology benchmarks. Benchmarks contain 200+ vetted PhD-level questions to assess AI biology knowledge. Author on WMDP benchmark and paper.
- Developed analytical framework and threat model estimating the biosecurity risk given evaluations results.

PhD Student (Bioinformatics) and Postdoctoral Scholar, Harvard Medical School – Cambridge, MA — **Aug 2018-Mar 2024**, Full-time

Selected Publications

Liu AB, Lee D, Jalihal A, Hanage W, Springer M. 2023. "Quantitatively assessing early detection strategies for mitigating COVID-19 and future pandemics." Nature Communications.

- Conceived of, recruited authors for and led study to estimate the benefits of billion-dollar academic and policy proposals for early detection systems.
- Found that benefits of early detection systems vary from marginal (0.4 weeks for COVID-19) to significant (110 weeks for HIV/AIDS), and confirmed results empirically with COVID-19 incidence and wastewater data.

Liu AB, Davidi D, Springer M, et al. 2022. "Association of COVID-19 Quarantine Duration and Postquarantine Transmission Risk in Four University Cohorts." JAMA (Journal of American Medical Association) Network Open.

Alley EC, Turpin M, *Liu AB*, Church GM, Esvelt KM, et al. 2020. "A machine learning toolkit for genetic engineering attribution to facilitate biosecurity." Nature Communications.

Gretton D, DeBenedictis EA, *Liu AB*, Yao AC, Esvelt KM. 2020. "Random adversarial threshold search enables specific, secure, and automated DNA synthesis screening." SecureDNA.

- Provided COVID-19 PCR diagnostics for Harvard students as part of university CLIA lab.

Software Engineer and Operations, OpenLabs – Palo Alto, CA — **Sep 2020-Apr 2021**, Full-time

- Served on a four-person software and operations team that surveyed 1.3 million+ respondents over three months to measure the persuasiveness of 800+ political TV ads in the 2020 U.S. presidential election.

Technical Consultant, Bipartisan Commission on Biodefense — **Sep 2020-Nov 2020**, Part-time (8h/wk)

- Served on a 10-person team that identified 15 technology priorities to stop future pandemics in "The Apollo Program for Biodefense" report, which recommended the federal government invest $10 billion annually on these priorities. These priorities had significant overlap with President Biden's 2021 American Pandemic Preparedness Plan.

Software Engineer, Platform Team, Udacity – Mountain View, CA — **Apr 2016-Aug 2017**, Full-time

- Developed and maintained software underlying udacity.com's authentication service in the Go language, enabling 1+ million Udacity users to login and manage accounts. Used Segment and DataDog to identify, diagnose and fix bugs.

Data Intern, Stripe – San Francisco, CA — **Jun 2014-Aug 2014**, Full-time

- Developed machine learning algorithms to predict Stripe's chargebacks and financial losses.

Algorithmic Trading Intern, Jump Trading – Chicago, IL — **Jun 2012-Aug 2012**, Full-time

- Researched and developed trading strategies for equity futures in the R programming language.

Research Publications, Invited Talks and Awards

Publications

See "Selected Work Experience." Additionally:

- Li N, Pan A, Gopal A, *Liu AB*, Wang A, Hendrycks D, et al. 2024. "The WMDP Benchmark: Measuring and Reducing Malicious Use With Unlearning." arXiv.

Invited Talks/Interviews

- SecureBio/MIT Sculpting Evolution Group, Cambridge, MA. "Quantitatively assessing early detection strategies for mitigating COVID-19 and future pandemics." **2023**
- Center for Communicable Disease Dynamics Meeting, Harvard School of Public Health, Boston, MA. "Quantitatively assessing early detection strategies for mitigating COVID-19 and future pandemics." **2023**
- Journal of American Medical Association Network Open Conversations Podcast. "Association of COVID-19 Quarantine Duration and Postquarantine Transmission Risk in 4 University Cohorts." **2022**
- Dartmouth ENGS 6: Technology and Biosecurity, Dartmouth College, Hanover, NH. "Attribution of genetic engineering: A practical and accurate deep-learning toolkit for biosecurity." **2020**

Notable Awards

- Intel Science Talent Search, National Finalist (top 40 of 1744 students) for genomics project identifying pathways in transplant rejection from gene expression data. **2011**
- Siemens Competition for Math, Science, and Technology, 5th place nationally (of 2033 students); talk here. **2010**

Languages and Other Skills

Programming languages/tools: Python (intermediate, 2025), R (intermediate, 2024).

Languages: Mandarin Chinese (beginner), Spanish (beginner).

Citizenship: U.S. citizen.