Andrew Liu

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Education and Academic Awards

Harvard University, Cambridge, MA — **Class of 2023 (anticipated)**

- 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 from government, industry and academia worldwide based on contributions to biosecurity and pandemic preparedness).

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

- S.M. Computer Science. GPA: 3.92.
- A.B. Math. GPA: 3.81. Elected *Phi Beta Kappa* and *John Harvard Scholar* (top five percent of class).
- Three-time Teaching Fellow: Machine Learning, Economics and Computation, and Mobile Software.

Selected Work Experience

PhD Student (Bioinformatics), Harvard Medical School – Cambridge, MA — **Aug 2018-Present**, Full-time

Publications

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.

- Co-led design and execution of this 12-author study to determine optimal COVID-19 quarantine length.
- Collaborated with researchers from four universities to collect COVID-19 test data and revise the publication.
- Led the statistical analysis of test data in the R programming language, interpretation of implications for quarantine duration, and drafting of the publication. Facilitated the publication through peer review.

Alley EC, Turpin M, *Liu AB*, Kulp-McDowall T, Swett J, Edison R, Von Stetina S, Church GM, Esvelt KM. 2020. *A machine learning toolkit for genetic engineering attribution to facilitate biosecurity.* Nature Communications.

- As middle author, developed and evaluated a machine learning method for second-order attribution: the identification of the lab of origin for a pathogen found in the wild.

Gretton D, DeBenedictis EA, *Liu AB*, Yao AC, Esvelt KM. 2020. *Fast, accurate, secure, and universal DNA synthesis screening via random adversarial thresholds.* SecureDNA.

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.
- Led daily, accurate creation of and respondent recruiting for all 800+ surveys while working with product management and data science teams to adapt to complex customer specifications and ensure 24-hour turnaround.
- Built and optimized software in Python and Javascript to automate survey creation and recruitment, which enabled OpenLabs to run surveys more quickly, 24% more cheaply and in higher volumes.

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 that the federal government invest $10 billion annually in R&D on these priorities. 14 of these 15 priorities were subsequently adopted in President Biden's American Pandemic Preparedness Plan, which proposed $65.3 billion of investment in these priorities over 7 to 10 years.
- For the report, co-led the literature review of 139 biodefense-related papers from scientific databases (e.g. PubMed) and government repositories (e.g. Homeland Security Digital Library). From the literature review, identified 13 technologies previously missed by the team, a few of which were incorporated into the 15 priorities.

Biostatistician, Khatri Lab, Stanford Medical School – Stanford, CA
Aug 2017-Aug 2018
Full-time

Publications

Warsinske HC, *Liu AB*, Khatri P, et al. 2018. *Assessment of Validity of a Blood-Based 3-Gene Signature Score for Progression and Diagnosis of Tuberculosis, Disease Severity, and Treatment Response.* JAMA Network Open.

- Analyzed gene expression and clinical data and contributed to drafting the publication.

Azad TD, Donato M, *Liu AB*, Khatri P, et al. 2018. *Inflammatory macrophage–associated 3-gene signature predicts subclinical allograft injury and graft survival.* Journal of Clinical Investigation Insight.

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 programming language, enabling 1+ million Udacity users to login and manage accounts smoothly. Used Segment and DataDog to rapidly identify, diagnose and fix bugs.

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."

Invited Talks/Interviews

- 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**

Language and Other Skills

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

Citizenship: U.S. citizen.