

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 worldwide based on contributions to pandemic preparedness).
- Lynch Foundation Fellow in Systems Biology at Harvard Medical School, 2022.

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).
- Five-time Teaching Fellow: Deep Learning for Biomedical Data, Computational Statistics for Biomedical Sciences, Machine Learning, Economics and Computation, and Mobile Software.

Selected Work Experience

PhD Student (Bioinformatics), Harvard Medical School – Cambridge, MA

Aug 2018-
Present

Publications

Liu AB, Lee D, Springer M, et al. 2023. "[Quantitatively assessing early detection strategies for mitigating COVID-19 and future pandemics.](#)" medRxiv preprint.

Full-time

- Conceived of, recruited authors for and led this study to estimate the benefits of billion-dollar academic and policy proposals for early detection systems. Mathematically analyzed infectious disease models, programmed models and data visualizations in R, and integrated code with manuscript text in Rmarkdown to ensure code-paper consistency.
- 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.
- Presented findings at Harvard School of Public Health Center for Communicable Disease Dynamics.

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*, 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. "[Random adversarial threshold search enables specific, secure, and automated DNA synthesis screening.](#)" SecureDNA.

Software Engineer and Operations, OpenLabs – Palo Alto, CA

Sep 2020-
Apr 2021

- 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.

Full-time

Technical Consultant, Bipartisan Commission on Biodefense

Sep 2020-
Nov 2020

- 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. These priorities had significant overlap with President Biden's 2021 American Pandemic Preparedness Plan.
- 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).

Part-time
(8h/wk)

Biostatistician, Khatri Lab, Stanford Medical School – Stanford, CA

Aug 2017-
Aug 2018

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.

Full-time

- 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

- 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.

Full-time

Algorithmic Trading Intern, Jump Trading – Chicago, IL

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

Jun 2012-

Aug 2012

Full-time

Research Publications, Invited Talks and Awards

Publications

See “Selected Work Experience.”

Invited Talks/Interviews

- 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**

Language and Other Skills

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

Citizenship: U.S. citizen.