

Alan Aw, PhD

Postdoctoral Researcher
Department of Genetics
University of Pennsylvania

🌐 <https://alanaw1.github.io>
✉ alan.aw@pennmedicine.upenn.edu
CV last updated: Sep 24, 2023

EDUCATION

University of California, Berkeley 2018 - 2023
PhD *with Designated Emphasis in Computational Biology*, Department of Statistics

- Dissertation title: “Statistical Genomics Through the Lens of Exchangeability, Stability and Stratification”
- GPA: 3.94 (Coursework in theoretical statistics, high-dimensional statistics, applied statistics, convex optimization, statistical genomics, statistical phylogenetics, and social epidemiology)

Stanford University 2014 - 2018
BS *with Honors*, Mathematical and Computational Science

- Honors thesis in Mathematical Evolution and Population Genetics

École normale supérieure de Lyon, France Summer 2014
Modern Mathematics International Summer School for Students

RESEARCH

(* denotes
(co-)first author)

Alan Aw*, Chentian Jin, Nilah Ioannidis, & Yun S. Song (2023). The impact of stability considerations on statistical fine-mapping. *eLife Reviewed Preprint*. (Shiny app)

Alan Aw*, Jeffrey Spence, & Yun S. Song (2023). A simple and flexible test of sample exchangeability with applications to statistical genomics. *Annals of Applied Statistics* (to appear). (Github)

Tian Chen Zeng*, **Alan Aw***, & Marcus W. Feldman (2018). Cultural hitchhiking and competition between patrilineal kin groups explain the post-Neolithic Y-chromosome bottleneck. *Nature Communications* **9**(1): article no. 2077. [PMID: 29802241]

Alan Aw & Noah A. Rosenberg (2018). Bounding measures of genetic similarity and diversity using majorization. *Journal of Mathematical Biology* **77**(3): 711-737. [PMID: 29569105]

Alan Aw & Cheng Yeaw Ku (2015). The covering radius problem for sets of 1-factors of the complete uniform hypergraphs. *Discrete Mathematics* **338**(6): 875-884.

Alan Aw (2014). The multicovering radius problem for some types of discrete structures. *Designs, Codes and Cryptography* **72**(2): 195-209.

Alan Aw (2012). The Turán number and probabilistic combinatorics. *The American Mathematical Monthly* **119**(6): 510-513.

WORK & RESEARCH EXPERIENCE

Bioinformatics Intern 8/1/2022 - 6/30/2023
Illumina, Inc.

- Investigated population structure-related biases in UK Biobank polygenic scores

- Preparing manuscript for submission

Statistical Geneticist Intern Summer 2021
23andMe, Inc.

- Implemented algorithms leveraging properties of multivariate Gaussian distributions to cut down GWAS summary statistic imputation time from 12 hours to 30 minutes
- Incorporated hyperparameter tuning to optimize imputation, and diagnosed performance trade-offs between choices of hyperparameters
- Applied algorithms to downstream genome-wide association studies involving millions of 23andMe customers (e.g., identifying regional hits for phenotypes)

Undergraduate Research Assistant Summer 2015 - Summer 2018
Departments of Biology and Statistics, Stanford University

Editorial and Marketing Intern March 2014 - July 2014
Asian Scientist Magazine (now part of Wildtype Media Group)

Research Intern January 2010 - February 2012
Various Research Institutions in Singapore

LEADERSHIP

R Bootcamp Instructor (Berkeley Statistical Computing Facility) August 2022
Answer questions one on one pertaining to various computational statistics topics. Teach module on Calculations (topics include: vectorization, use of `apply` and variants, merging and joining, stratified analyses)

Reading Group Organizer (Nilah Ioannidis Lab) Spring 2021
Online reading group focused on fine-mapping. Facilitate discussion and prepare paper reading lists.

SGSA Web Committee (Department of Statistics, UC Berkeley) Spring 2019 - Fall 2022
Manage the Statistics Graduate Student Association's website ([webpage link](#)).

Managing Editor (Stanford Undergraduate Research Journal) 2016 - 2017
Oversaw a team of student writers, editors and marketers to communicate faculty and student research in creative ways. Redesigned website and implemented creative ways of communicating research.

Co-President (Singaporeans at Stanford) 2015-2016
Planned and executed activities to help Singaporean students stay connected within Stanford and with the larger Bay Area Singaporean network. Lead Organizer for Chinese New Year dinner involving 100 guests. Student representative at Prime Minister's visit to the Bay Area as well as the 2016 Singapore-US Trade and Technology Engagement Roundtable.

SERVICE TO COMMUNITY

Research Mentor Fall 2021 - Summer 2023
As a graduate student in the Song Lab, I mentored several students (Xurui Rachel Chen, Fanding Zhou) to build open-source software for flexible non-parametric two-sample tests for single-cell RNA-seq data. Software (Github) based on [arXiv:2008.06664](#).

Academic Mentor Spring 2020 - Spring 2023
Through the Berkeley Statistics Graduate/Undergraduate Program, I mentored three undergraduates by providing advice on coursework and career opportunities. Under my mentorship and on top of his already superb capabilities, one student, Wenhao Pan, successfully navigated coursework in computer science and mathematics, as well as undergraduate research opportunities with the Departments of IEOR, Sociology, and Statistics. He is an incoming (Fall 2023) PhD student in Statistics at the University of Washington.

Journal Peer-Reviewing
Statistical Applications in Genetics and Molecular Biology, Health Services Research

SKILLS

Programming Languages: R (including interfacing with C++), Python.

Tools: Git, Bash, GNU Multiple Precision Library.

Bioinformatics Software: PLINK, SuSiE, Polyfun, LDpred, momi2, msprime, ms, SLiM, Seurat.

Languages: Bilingually native in Chinese, and can understand basic French.

SOFTWARE

R: flintyR

Python: flintyPy

TEACHING

Berkeley:

- Stat 135: Concepts of Statistics (Spring 2019)
- Stat 153: Introduction to Time Series (Spring 2020)
- COMPSCI198: Algorithmic Fairness and the Genome (Fall 2021)
 - Gave a guest lecture about the negative impact of neglected LD pattern heterogeneities between populations on the identification of causal variants and on the construction of equitable polygenic scores
 - Organized guest lecture by 23andMe scientist, Dr. James Ashenhurst, to share efforts by 23andMe to reduce healthcare disparities

AWARDS

JSM Travel Award, SF Bay Area Chapter of the American Statistical Association, CA	2022
Outstanding GSI Award, Berkeley, CA	2021
Mortimer Fleishhacker Scholarship, Berkeley, CA	2019
Dean's Award for Academic Achievement, Stanford, CA	2018
Best Poster, 23andMe Genome Research Day, Mountain View, CA	2018
Bio-X Undergraduate Research Fellowship, Stanford, CA	2016