Jordan Cahoon

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Education

Exp. 2024 — University of Southern California
B.S Computer Science, Minor in Computational Biology & Bioinformatics
GPA: 3.86

Research Experience

Jul 2023 - Present — **Undergraduate Researcher.**
Advised by Charleston Chiang, Iain Mathieson & Sara Mathieson
University of Southern California, University of Pennsylvania, & Haverford College

- On-going project collaboration to develop a deep learning method to detect ancient introgression from ancestral recombination graphs without a sequenced reference.
- Achieved comparable results in simulation with statistical method, S*.

Feb 2021 - May 2023 — **Undergraduate Researcher.**
Advised by Charleston Chiang
University of Southern California, Keck School of Medicine

- Demonstrated discrepancy when deploying the state-of-the-art TOPMed Reference panel for imputation of non-European populations such as East Asian, South Asian, Oceanian, and Southeast Asian populations, thus exacerbating disparity in performing genome-wide genetic studies in diverse understudied populations.
- Designed a framework using meta-imputation to improve imputation quality in East and Southeast Asian cohorts, particularly for population-specific variants.
- Developed interactive map to visualize imputation statistics for over 120 populations from 39 publications.

Oct 2022 - Sept 2023 — **Undergraduate Researcher.**
Advised by Luis A. Garcia
University of Southern California, Department of Computer Science

- Evaluated generalized stress detection for health workers using wearable devices across three datasets with shared stress representations.
- Demonstrated gradient boosting trees outperform linear support vector machines, random forest, and feed-forward neural networks for continuous stress detection.
- Identified current limitations of generalized stress detection driven limited shared modalities across datasets, small sample sizes, and varying stress definitions.

Jun 2020 - Jan 2021 — **Undergraduate Researcher.**
Advised by Elia Tait-Wojno
University of Washington, Department of Immunology

- Elucidated how the PGD2-CRTH2 pathway suppresses Type 2 intestinal immune response during helminth infections in murine models with single cell RNA sequencing analysis.
- Identified canonical markers of epithelial immune cell types and characterized gene expression in inflammatory immune response in murine cecum during infection.

Jul 2019 - Aug 2019

Research Intern.
Advised by Jake Valenzuela
The Institute for Systems Biology, Baliga Lab

- Developed electroporation protocol that facilitates transfer of CRISPR-Cas9 complex into *C. reinhardtii*.
- Created and presented how nitrogen starvation increases lipid production in *C. reinhardtii*.

Work Experience

Jun 2021 - July 2023

Viterbi Student Ambassador, Content Lead.
USC Viterbi School of Engineering Admissions

- Led team of 12 students to produce bi-weekly virtual student panels about student life for audiences of 200+ prospective engineering students.
- Advertised panels through social media outreach, bi-weekly YouTube videos, and Spotify podcasts.

Aug 2022 - May 2023

Artificial Intelligence Intern.
The Ellison Institute for Transformative Medicine

- Developed deep learning models to automate the diagnosis for breast and prostate cancer from digital pathology.
- Refined quality control pipeline to process thousands of whole slide images (WSI) in the cloud.

May 2022 - Aug 2022

Software Engineering Intern. Oracle Cloud Infrastructure

- Designed and tested automated daily health checks for cloud billing accounts.

Awards & Honors

Barry Goldwater Scholarship
USC Viterbi Dean's List
USC Viterbi Undergraduate Merit Research Fellowship
USC Presidential Scholarship
USC Dornsife Thematic Option, Reading & Writing

Publications

[5] Fan C, **Cahoon JL**, Dinh BL, Vecchyo DO, Huber C, Edge MD, Mancuso N, Chiang CWK. *"A likelihood-based framework for demographic inference from genealogical trees"*. Preprint. 2023 Oct 10. doi: 10.1101/2023.10.10.561787.

[4]

Cahoon JL, Garcia L. *"Continuous Stress Monitoring for Healthcare Workers: Evaluating Generalizability Across Real-World Datasets"*. The 14th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB). 2023 Sept 3. doi: 10.1145/3584371.3612974.

[3] **Cahoon JL**, Rui X, Tang E, Simons C, Langie J, Chen M, Lo YC, Chiang CWK. *"Imputation Accuracy Across Global Human Populations."* Preprint. 2023 Jun 22. doi: 10.1101/2023.05.22.541241. [International Genetic Epidemiology Society 32nd Annual Meeting Best Poster]

[2] Sheng X, Xia L,**Cahoon JL**, Conti DV, Haiman CA, Kachuri L, Chiang CWK. *"Inverted genomic regions between reference genome builds in humans impact imputation accuracy and decrease the power of association testing."* Human Genetics and Genomics Advances. 2022 Nov 11. doi: 10.1016/j.xhgg.2022.100159. [HGGAdvances Award for Outstanding Early Career Publication]

[1] Oyesola OO, et. al. *"PGD2 and CRTH2 counteract Type 2 cytokine-elicited intestinal epithelial responses during helminth infection."* J Exp Med. 2021 Sep 6;218(9):e20202178. doi: 10.1084/jem.20202178.

Oral Presentations & Other Projects

May 2023 Imputation Efficacy Across Global Human Populations, *Southern California Evolutionary Genetics and Genomics Meeting 2023*, University of California Irvine.

Dec 2022 Assessing Imputation Quality for Diverse Populations, *Department Research Seminar, Center for Genetic Epidemiology* Keck School of Medicine.

Nov 2022 Predicting Foster Care Outcomes in the United States with the National Youth in Transition Database, *Artificial Intelligence for Sustainable Development Final Presentation,* University of Southern California.

Nov 2022 Detecting Chronic Stress in Medical Residents with Wearable Devices, *Fall CAIS++ Project Showcase 2023*, University of Southern California.

Apr 2022 Utilizing Reinforcement Learning to Predict Polyculture Formations, *Spring CAIS++ Project Showcase 2022,* University of Southern California.

Dec 2021 Modeling Malaria Outbreaks Utilizing Weather Factors, *Fall CAIS++ Project Showcase 2021,* University of Southern California.

Apr 2021 Predicting pandemic risk of Influenza mutations with Deep Learning, *Spring CAIS++ Project Showcase 2021,* University of Southern California.

Teaching

Jan - Apr 2023 Project mentor for undergraduate machine learning projects through CAIS++

Sep - Dec 2022 Curriculum Lead for open source deep learning curriculum for undergraduates

Jan - May 2022 Course Producer for CSCI 104, Data Structures and Objected Oriented Programming

Leadership

Aug 2022 - May 2023 **Co-President.** The Center for Artificial Intelligence's Student Branch (CAIS++)
Directed all organization initiatives including 5-8 semester projects, 4 Fall curriculum groups, 2 project showcases, weekly general meetings, and speaker events to engage undergraduates in artificial intelligence.

Sep 2021 - May 2022 **Project Manager.** Novus Think Tank. Oversaw six focus project groups that targeted key social issues impacting the university and surrounding areas.

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