

**GILLIAN CHU**  
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 Homepage: <https://gillichu.github.io/>

## EDUCATION

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<b>PhD</b>	<b>Princeton University</b> Department of Computer Science	<b>Aug 2022 - May 2027 (Expected)</b>
<b>MS</b>	University of Illinois at Urbana-Champaign Program in Ecology, Evolution and Conservation Thesis: Phylogenetic Placement Advisor: Professor Tandy Warnow	Dec 2020 - August 2022
<b>BS</b>	University of California, Berkeley Department of Computer Science	Aug 2016 - Dec 2020
<b>HSD</b>	Phillips Exeter Academy	Aug 2014 - May 2016

## RESEARCH INTERESTS

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*Computational Biology, Computational/Statistical Genetics, Probabilistic Graphical Models.*  
 My interests are at the intersection of computer science, statistics, and biology. I am interested in building tools that help us understand the evolution of complex and heterogeneous biological systems.

## ACADEMIC HONORS AND FELLOWSHIPS

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- RECOMB-CCB Scientific Communications (2022) 1<sup>st</sup> Place (*Awarded \$200*).
- Genetics Society of America: Presidential Membership Initiative (2022). *Awarded 1-year membership to GSA, Early Career Leadership Program and GENETICS Peer Review Training Program.*
- NSF GRFP (5 years), 2021: *Three-year annual stipend of \$34,000.*
- Excellent Graduate Student Instructor, UIUC. Spring 2021. *Introduction to Programming for Engineers and Scientists (CS101).*

## INDUSTRY & RESEARCH EXPERIENCE

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<b>Research Assistant</b> , Princeton University Advisor: Ben Raphael	<i>Aug 2022 - Present</i>
<ul style="list-style-type: none"> <li>• Leveraging graph motifs to identify drugs with previously unrecognized targets</li> <li>• Designing a new probabilistic model to study cell differentiation</li> </ul>	
<b>Research Assistant</b> , University of Illinois at Urbana-Champaign Advisor: Tandy Warnow	<i>Jan 2021 - Present</i>
<ul style="list-style-type: none"> <li>• Designed fast multiple sequence alignment method capable of aligning ultra-large datasets</li> <li>• Designed fast and scalable phylogenetic placement methods</li> </ul>	
<b>Research Assistant</b> , University of Illinois at Urbana-Champaign Advisor: Mohammed El-Kebir	<i>Jan 2021 – Dec 2021</i>

- Designing interactive visual editor for copy number calls in bulk tumor cell data

**Research Assistant**, University of California Berkeley *Sept 2019 – May 2021*

Advisor: Priya Moorjani

- Implemented an efficient method of uncovering founder events in modern populations
- Designed an efficient and accurate local ancestry inference method

**Research Assistant**, University of California Berkeley *Sept 2019 – Dec 2020*

Advisor: Satish Rao

- Designed a distance-based phylogenetic tree inference algorithm

**Databricks**, San Francisco

*May – Aug 2019*

**Software Engineering Intern**, Observability Team

- Implemented distributed tracing for performance analysis across microservice architecture

**Researcher**, Sperax

*Apr 2018 – Oct 2021*

- Analyzed consensus protocols for distributed systems and implemented a test net
- Designed Decentralized Autonomous Organization (DAO) voting protocol and modeled token economics

**Standard Bounties**, Consensys

*June 2018 – Aug 2018*

**Fullstack Software Engineering Intern**

- Built out RESTful API, and smart contract web application

## TEACHING EXPERIENCE

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### University of Illinois at Urbana-Champaign

- **Intro to Programming for Engineers and Scientists**. CS101. Graduate Student Instructure, UIUC Department of Computer Science. Spr' 21. **Excellent Graduate Instructor Award**.

### University of California, Berkeley

- **Bioinformatics Bootcamp**. Teaching Assistant, Center for Computational Biology. Aug' 20.
- **Operating Systems and System Programming**. CS162. Reader, UC Berkeley EECS. Su'20.
- **Efficient Algorithms and Intractable Problems**. CS170. Undergraduate Student Instructor, UC Berkeley EECS. Fa'18, Spr'19, Fa'19, Spr'20.
- **Discrete Mathematics and Probability**. CS70. Reader, UC Berkeley EECS. Fa'17, Spr'18, Su'18.
- **Building with Blockchain for Web 3.0**. Guest Lecturer, UC Berkeley IEOR. Spr'20.
- **Blockchain Fundamentals**. CS198. Lecturer, UC Berkeley. Spr'18, Fa'18.
- **Blockchain for Enterprise**. Guest Lecturer, UC Berkeley Haas Business. Spr'19. Fa'19.
- **Blockchain for Lawyers**. Guest Lecturer, UC Berkeley Boalt Law. Spr'18.
- **EdX Blockchain Fundamentals**. Course Advisor, UC Berkeley. Spr'18.

## PUBLICATIONS

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\* indicates joint first-author

### ***Journal Papers in Preparation***

*On fast, accurate local ancestry inference.* **Chu, G.**, Nisonoff, H., Moorjani, P. *KernelMix is a modular method to perform local ancestry inference using discriminative classifiers and a conditional random field.*

### **Conference Papers**

Lalani, Z.\*, **Chu, G.\***, Zaccaria, S., El-Kebir, M., “User-guided local and global copy-number segmentation for tumor sequencing data.” bioRxiv doi: 10.1101/2022.01.15.476457v1. RECOMB-CCB 2022.

### **Journal Papers**

**Chu, G.**, Warnow, T., “SCAMPP+FastTree: Improving Scalability for Likelihood-Based Phylogenetic Placement.” *Bioinformatics Advances*, vbad008.

Park M, Ivanovic S, **Chu G**, Shen C, Warnow T. UPP2: Fast and Accurate Alignment of Datasets with Fragmentary Sequences, *Bioinformatics*, 2023; btad007.

Lalani Z\*, **Chu G\***, Hsu S, Kagawa S, Xiang M, et al. (2022) CNAViz: An interactive webtool for user-guided segmentation of tumor DNA sequencing data. *PLOS Computational Biology* 18(10): e1010614.

Tournebize, R., **Chu, G.**, & Moorjani, P. (2022). Reconstructing the history of founder events using genome-wide patterns of allele sharing across individuals. *PLoS Genetics*, 18(6), e1010243.

### ***Workshop Papers***

Y. Wang, Sun J., Wang, X., Wei, Y., Wu, H., **Chu, G.**, Yu, Z., “Sperax: An Approach to Defeat Long Range Attacks in Blockchains,” IEEE INFOCOM 2020 – IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS), Toronto, ON, Canada, 2020, pp. 574-579. doi: 10.1109/INFOCOMWKSHPS50562.2020.9163036.

**PRESENTATIONS**

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**Poster Presentation**, “SCAMPP+FastTree: Improving Scalability for Likelihood-Based Phylogenetic Placement.” ISMB-LA, Oct 2022.

**Conference Presentation**, “User-guided local and global copy-number segmentation for tumor sequencing data.” RECOMB-CCB, May 2022.

**Conference Presentation**, “MGDrive: Mosquito Gene Drive Explorer: Landscape Clustering,” National Conference on Undergraduate Research, March 2020.

**Retreat Presentation**, “MGDrive: The Original Trilogy,” UC Berkeley Computational Biology Retreat, October 2018.

**Conference Presentation**, “A Technical Overview of Blockchain Development,” TiE Inflect Silicon Valley, April 2018.

**COMMUNITY SERVICE**

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**Shield the Bay**

Co-Founder/Finance, Berkeley, March 2020 – Present

**Berkeley ANova**

Events Committee Chair, Berkeley, Sept 2016 – June 2018

**SKILLS/LANGUAGES**

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**Programming:** Python, Java, C, Javascript, R, React, Redux, Solidity, Go, Jsonnet, Scala

**Tools/Framework:** HTML, Git, Django, Docker, AWS, Remix, CircleCI, Webpack, Jenkins, Kubernetes, Grafana

**Genomics:** samtools, bwa, GATK

**REFERENCES**

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**Dr. Ben Raphael**, Professor  
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Princeton University  
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**Dr. Tandy Warnow**, Professor  
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Email: [warnow@illinois.edu](mailto:warnow@illinois.edu)

**Dr. Mohammed El-Kebir**, Assistant Professor  
Department of Computer Science  
University of Illinois, Urbana-Champaign  
Email: [melkebir@illinois.edu](mailto:melkebir@illinois.edu)

**Dr. Priya Moorjani**, Assistant Professor  
Center for Computational Biology  
University of California, Berkeley  
Email: [moorjani@berkeley.edu](mailto:moorjani@berkeley.edu)

**Dr. Satish Rao**, Professor  
Electrical Engineering and Computer Science  
University of California, Berkeley  
Email: [satishr@berkeley.edu](mailto:satishr@berkeley.edu)

**Dr. John Marshall**, Assistant Professor  
School of Public Health  
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**Dr. Jaspal Sandhu**, Professor of Practice  
School of Public Health  
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