

SEI H. CHANG

seichang00@gmail.com · (408) 335-9387

linkedin.com/in/seichang

EDUCATION

Columbia University

Sep 2022-May 2026

PhD Candidate in Computer Science, **NSF Graduate Research Fellow (GRFP)**

- Advisor: Prof. David A. Knowles
- Relevant Coursework: Machine Learning in Functional Genomics (Teaching Assistant), Interpretable Machine Learning, Probabilistic Graphical Models, Advanced Algorithms

University of California, Los Angeles

Sep 2018-Jun 2022

B.S Computer Science with a Minor in Bioinformatics

Honors: Magna cum laude (GPA 3.91/4.0)

SKILLS

Programming Python, C++, C, Rust, SQL, Java, Bash, Node.js, JS, HTML, CSS

Tools/Frameworks PyTorch, scikit-learn, AWS, GCloud, Jupyter, Docker, Git, Unix, Slurm, HPC, Android

PUBLICATIONS

1. **Sei Chang**, Zaiqian Chen, Bianca Dumitrascu, & David A. Knowles (2024). CellFlows: Inferring Splicing Kinetics from Latent and Mechanistic Cellular Dynamics. In *ICML'24 Workshop ML for Life and Material Science: From Theory to Industry Applications*. [\[URL\]](#)
2. Varuni Sarwal, Sebastian Niehus, Ram Ayyala, Minyoung Kim, Aditya Sarkar, **Sei Chang**, Angela Lu et al. "A comprehensive benchmarking of WGS-based deletion structural variant callers." *Briefings in Bioinformatics* 23, no. 4 (2022): bbac221. doi: 10.1093/bib/bbac221. NSF grant 1705197 and NIH grant R25MH109172 [\[URL\]](#)
3. Keith Mitchell, Jaqueline J. Brito, Igor Mandric, Qiaozhen Wu, Sergey Knyazev, **Sei Chang**, Lana S. Martin et al. "Benchmarking of computational error-correction methods for next-generation sequencing data." *Genome Biology* 21, no. 1 (2020): 1-13. doi: 10.1186/s13059-020-01988-3. [\[URL\]](#)
4. **Sei Chang** and Kisik Jeong. "A mobile application for fine dust monitoring systems." *18th IEEE International Conference on Mobile Data Management (MDM)*, pp. 336-339. IEEE, 2017. [\[URL\]](#)

PRESENTATIONS

1. **Sei Chang**, Karine Choquet, L. Stirling Churchman, David A Knowles. "Deep learning-based prediction of multi-intron splicing order from pre-mRNA sequence." Machine Learning in Computational Biology (2023). Poster Presentation.
2. Varuni Sarwal, Seungmo Lee, **Sei Chang**, Serghei Mangul. "SVPred: An Integrated Framework for Structural Variant Discovery." American Society of Human Genetics (ASHG) Annual Meeting 2022. Poster Presentation.

RESEARCH EXPERIENCE

New York Genome Center

Aug 2022 - Current

Machine Learning Researcher, Knowles Lab

- **Deep generative modeling** of splicing dynamics in single-cells using variational autoencoder (VAE) and neural ordinary differential equations (neural ODE)
- **Deep learning**-based prediction of alternative splicing and protein binding from pre-mRNA sequence using task-specific **Mixture of Experts (MoE)**
- Analyzing splicing patterns in ALS disease using **nuclear norm PCA** and probabilistic differential splicing

UCLA Health

Sep 2018 - Jun 2022

Research Intern, UCLA Computational Medicine

- Comprehensive evaluation of **bioinformatics** methods for structural variant calling and error correction for **whole genome sequencing (WGS)** data
- Applied **pseudo-alignment** for transcript abundance quantification of Geuvadis RNA-Seq data to estimate haplotype-specific expression

Illumina

Jun 2021 - Aug 2021

Bioinformatics Intern, Primary Analysis

- Designed algorithms that map instrumented sequencing reads containing quality metrics from Illumina's **Real Time Analysis (RTA)** to annotated genomic regions
- Performed **t-SNE dimensionality reduction** on the mappings to identify potential sequencer bias from Illumina flow cell clusters contributing to the observed regions

SOFTWARE ENGINEERING

Parallel Systems

Sept 2021 - Dec 2021

Software Engineering Intern, Fleet Management Backend

- **Fleet management** software for autonomous zero-emissions freight transport vehicles
- Implemented real-time data processing and **multithreaded** applications in **Rust** for vehicle telemetry
- Integrated **serverless telemetry backend** to fleet management data service in **Rust, Bash, SQL**

Yahoo Inc.

Jun 2020 - Aug 2020

Software Engineering Intern, Mail Production Engineering

- Extended functionality of auto-remediation services through **ChatOps** development
- Integrated **ServiceNow** to Slack automation, enabling user queries to save **80 hours per 1000 actions**

COURSEWORK

Machine Learning	Data Structures & Algorithms	Programming Languages
Artificial Intelligence	Operating Systems	Computer Architecture
Natural Language Processing	Database Systems	Computer Organization
Software Engineering	Algorithms in Bioinformatics	Automata Theory
Linear Algebra	Probabilistic Graphical Modeling	Discrete Mathematics

AWARDS AND HONORS

- **NSF Graduate Research Fellowship Program (GRFP) Award** • '22
- **Muriel K. and Robert B. Allan Scholarship, UCLA Samueli Engineering** • '19, '20, '21
- **Tau Beta Pi Engineering Honor Society** • Inducted Spring '21
- **Upsilon Pi Epsilon Honor Society** • Inducted Fall '19
- **National Merit Scholarship (NMSC) Winner** • '18