Justin Hong

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Education

2022 – **Ph.D. Computer Science (Computational Biology Track)**
COLUMBIA UNIVERSITY
Advisor: Elham Azizi

2019 – 2020 **M.S. Electrical Engineering and Computer Science**
UNIVERSITY OF CALIFORNIA, BERKELEY, *4.00/4.00*
Advisors: Yun Song, Kannan Ramchandran
Thesis: A Likelihood-based Deconvolution of Bulk Gene Expression Data Using Single-cell References [5].

2015 – 2019 **B.A. Computer Science & Molecular and Cellular Biology (emph. Immunology)**
UNIVERSITY OF CALIFORNIA, BERKELEY, *3.95/4.00*
Graduated with Highest Distinction and EECS Department Honors.

Research Experience

2021 – 2022 Research Engineer. YOSEF LAB, UC BERKELEY
Advisor: Nir Yosef. Developed open-source software for deep probabilistic modeling of single cell omics data, `scvi-tools` [2]. Contributed to novel research work concerning RNA velocity inference and meta-analysis of large-scale scRNA-seq datasets [1, 3].

2019 – 2020 Graduate Student Researcher. SONG LAB, UC BERKELEY
Advisor: Yun Song. Developed a method for the deconvolution of bulk RNA-seq samples using a single-cell RNA-seq reference [4].

2018 – 2019 Undergraduate Student Researcher. BLISS LAB, UC BERKELEY
Advisor: Kannan Ramchandran. Developed a robust method for the federated learning regime in the presence of adversaries [6].

2016 – 2017 Research Assistant. BREM LAB, UC BERKELEY
Advisor: Rachel Brem. Trained in experimental wet lab protocols concerning gene transformations and knockouts in yeast.

Honors & Awards

2020 Outstanding Graduate Student Instructor Award, UC Berkeley
2019 Graduation with Highest Distinction, UC Berkeley (equiv. *summa cum laude*)
2019 EECS Honors, UC Berkeley
2018 Jim and Donna Gray Scholarship, UC Berkeley
2017 Upsilon Pi Epsilon, UC Berkeley

Publications

1. Pierre Boyeau*, **Justin Hong***, Adam Gayoso, Michael Jordan, Elham Azizi, and Nir Yosef. "Deep generative modeling for quantifying sample-level heterogeneity in single-cell omics". In: *Machine Learning in Computational Biology (MLCB), Oral presentation 2022*. (2022). [URL].

2. Adam Gayoso*, Romain Lopez*, Galen Xing*, Pierre Boyeau, Valeh Valiollah Pour Amiri, **Justin Hong**, Katherine Wu, Michael Jayasuriya, Edouard Mehlman, Maxime Langevin, Yining Liu, Jules Samaran, Gabriel Misrachi, Achille Nazaret, Oscar Clivio, Chenling Xu, Tal Ashuach, Mariano Gabitto, Mohammad Lotfollahi, Valentine Svensson, Eduardo da Veiga Beltrame, Vitalii Kleshchevnikov, Carlos Talavera-López, Lior Pachter, Fabian J. Theis, Aaron Streets, Michael I. Jordan, Jeffrey Regier, and Nir Yosef. "A Python library for probabilistic analysis of single-cell omics data". In: *Nature Biotechnology* 40.2 (2022), pp. 163–166. [URL].

3. Adam Gayoso, Philipp Weiler, Mohammad Lotfollahi, Dominik Klein, **Justin Hong**, Aaron M Streets, Fabian J Theis, and Nir Yosef. "Deep generative modeling of transcriptional dynamics for RNA velocity analysis in single cells". In: *bioRxiv* (2022). [URL].

4. Dan D Erdmann-Pham*, Jonathan Fischer*, **Justin Hong**, and Yun S Song. "Likelihood-based deconvolution of bulk gene expression data using single-cell references". In: *Genome Research* 31.10 (2021), pp. 1794–1806. [URL].

5. **Justin Hong**, Dan D Erdmann-Pham, Jonathan Fischer, and Yun S Song. "A Likelihood-based Deconvolution of Bulk Gene Expression Data Using Single-cell References". Master's Thesis. University of California, Berkeley, 2021. [URL].

6. Avishek Ghosh*, **Justin Hong***, Dong Yin, and Kannan Ramchandran. "Robust Federated Learning in a Heterogeneous Environment". In: *ICML Workshop on Privacy and Security in ML* (2019). [URL].

Software

2022 — `MrVI` – A library for deep sample-level meta-analysis of single-cell omics data.

2021 – 2022 — `scvi-tools` – A library for deep probabilistic analysis of single-cell omics data.

2019 – 2020 — `RNA-Sieve` – A package for deconvolution of bulk RNA-seq data with single-cell RNA-seq references.

Teaching experience

2019–2020 — Head Graduate Student Instructor. UC BERKELEY
Course Title: Probability and Random Processes (EE 126)
Responsibilities: Developed course content, assignments, and exams.
Organized staff of over ten student instructors. Lectured as a substitute.
Coordinated the course transition to fully online during the COVID-19 pandemic.

2018–2019 — Undergraduate Student Instructor. UC BERKELEY
Course Title: Probability and Random Processes (EE 126)

Responsibilities: Taught discussions sections, led office hours, created course content.

2016–2017 Undergraduate Student Instructor / Course Tutor, UC BERKELEY
Course Title: Structure and Interpretation of Computer Programs (CS 61A)
Responsibilities: Taught discussion sections, led office hours, graded exam content.

Industry Experience

2020 – 2021 Software Engineer. NURO
Developed infrastructure software for the evaluation and introspection of the autonomy software stack. Mentored new hires and a summer intern.

Summer 2019 Software Engineer Intern. NURO
Developed software for remote large-scale bot fleet management.

Summer 2018 Software Engineer Intern. PALANTIR
Developed code editing and execution software within the Foundry platform.

Summer 2017 Software Engineer Intern. AFFINITY
Developed software for customer relationship management in the venture capital space.