James Bowden

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EDUCATION

UC Berkeley | July 2023 – Present
Ph.D. Computer Science

Caltech | 2019 – 2023
B.S. Computer Science, Data Science

EXPERIENCE

PhD Student at **Berkeley AI Research (BAIR)** | July 2023 – Present
Developing ML methods for data-driven design, primarily of proteins and materials.
Advised by Jennifer Listgarten and Sergey Levine.

Yisong Yue's group at **Caltech** | June 2020 – August 2023
Developed flexible deep kernel surrogates to replace difficult kernel choices when using Bayesian optimization for scientific design problems. Applied to COVID antibody design with LLNL.

Ryan Adams' group at **Princeton** | June 2022 – January 2023
Developed end-to-end differentiable pipeline for rational design of materials according to arbitrary mechanical objectives ("topology optimization"). Introduced an implicit surface neural design parameterization to enable specification of priors in terms of continuous functions (e.g., smoothness).

Katie Bouman's group at **Caltech** | January 2022 – June 2022
Exaggerated image classifier decision features for model explainability using CycleGAN.

Anima Anandkumar's group at **Caltech** | January – March 2022
Trained more efficient diffusion models via hierarchical conditioning in the Fourier domain.

Software Engineering Intern at **Uber** | June – September 2021
Designed deep conditional models of driver offer acceptance and trip completion rates.

(Head) Teaching Assistant at **Caltech** | September 2020 – June 2023
Held office hours, wrote assignments, gave code reviews, led lab, graded code. As Head TA for CS 2, hired/trained/supported/managed 20 other TAs and helped design/improve course.
CS 156ab: **Machine Learning** [FA 21/22 SP 22/23] • CS 24: **Computing Systems** [FA 21] • CS 3: **Software Design** [SP 21] • CS 2: **Data Structures/Algorithms** [WI 21/22/23] • CS 1: **Intro CS** [FA 20]

SELECTED PUBLICATIONS

JC Bowden, et al. Leveraging Discrete Function Decomposability for Scientific Design. *ICLR*, 2026.

J Yang, RG Lal, **JC Bowden**, et al. Active learning-assisted directed evolution. *Nat. Commun.*, 2025.

F Zhang, J Song, **JC Bowden**, et al. Learning Region of Interest for Bayesian Optimization with Adaptive Level-Set Estimation. *ICML*, 2023.

JC Bowden, et al. Deep Kernel Bayesian Optimization. *Pre-print*, 2021.

AWARDS & SERVICE

NSF GRFP (2023 – 2028) • UC Berkeley Chancellor's Fellowship (2023) • Berkeley EECS Excellence Award (2023) • Caltech Bhansali Prize for Outstanding CS Research (2023) • Caltech Rypisi SURF Fellow (2022) • Caltech CMS DEI Committee (2022 – 2023) • Caltech SURF Ambassador (2020, 2021) • Reviewer: ICLR 2026