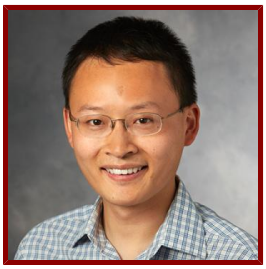
Stanford



James Zou

Associate Professor of Biomedical Data Science and, by courtesy, of Computer Science and of Electrical Engineering

Department of Biomedical Data Science

Bio

BIO

I am an Associate Professor of Biomedical Data Science and, by courtesy, of Computer Science and Electrical Engineering at Stanford University.
I work on making AImore reliable, human-compatible and statistically rigorous, and am especially interested in applications in human disease and health. I received my Ph.D from Harvard in 2014, and was at one time a member of Microsoft Research, a Gates Scholar at Cambridge and a Simons fellow at U.C. Berkeley. I joined Stanford in 2016 and am excited to also be a Chan-Zuckerberg Investigator. We are also a part of the Stanford AI Lab.
My research is supported by two Chan-Zuckerberg Biohub Investigator Awards, the Sloan Fellowship, the NSF CAREER Award, a Top Ten Clinical Achievement Award and faculty awards from Google, Adobe and Amazon.

ACADEMIC APPOINTMENTS

- Associate Professor, Department of Biomedical Data Science
- Associate Professor (By courtesy), Computer Science
- Associate Professor (By courtesy), Electrical Engineering
- Member, Bio-X
- Faculty Affiliate, Institute for Human-Centered Artificial Intelligence (HAI)
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Chan-Zuckerberg Investigator, CZ Biohub (2023)
- Sloan Research Fellowship, Sloan Foundation (2021)
- NSF CAREER Award, NSF (2020)
- RECOMB Best Paper, RECOMB (2019)
- Google Faculty Award, Google (2018)
- Chan-Zuckerberg Investigator, CZ Biohub (2017)
- Simons Research Fellow, Simons Foundation (2014)
- NSF GRFP, NSF (2008)
- Gates-Cambridge Scholar, Gates Foundation (2007)

LINKS

- My website: https://www.james-zou.com/

- Twitter: https://twitter.com/james_y_zou

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My group works on both foundations of statistical machine learning and applications in biomedicine and healthcare. We develop new technologies that make ML more accountable to humans, more reliable/robust and reveals core scientific insights.

We want our ML to be impactful and beneficial, and as such, we are deeply motivated by transformative applications in biotech and health. We collaborate with and advise many academic and industry groups.

Teaching

COURSES

2025-26

- Deep Learning in Genomics and Biomedicine: BMDS 273, CS 273B, GENE 236 (Spr)
- Foundation Models for Healthcare: BMDS 271, CS 277, RAD 271 (Win)

2024-25

- Foundation Models for Healthcare: BIODS 271, CS 277, RAD 271 (Spr)

2023-24

- Biomedical Data Science Student Seminar: BIODS 201, BIOMEDIN 201 (Win)
- Critical Exploration of Topics in Biomedical Data Science: Generative AI: BIODS 290 (Aut)
- Deep Learning in Genomics and Biomedicine: BIODS 237, CS 273B (Spr)
- Foundation Models for Healthcare: BIODS 271, CS 277, RAD 271 (Win)

2022-23

- Deep Learning in Genomics and Biomedicine: BIODS 237, BIOMEDIN 273B, CS 273B, GENE 236 (Spr)
- Workshop in Biostatistics: BIODS 260B, STATS 260B (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Hannah Kleidermacher

Postdoctoral Faculty Sponsor

Siyu He, Sheng Liu, Pan Lu

Doctoral Dissertation Advisor (AC)

Joseph Boen, Bowen Chen, Batu El, Yixing Jiang, Jake Silberg, Elana Simon, Rahul Thapa, Mert Yuksekgonul

Orals Evaluator

Mert Yuksekgonul

Master's Program Advisor

Shyam Sai Bethina, Hannah Clay, Andrew Gao, Everett Lee, Febie Lin, Eric Liu, Ryan Park, Mehrzad Sajjadi, Daniel Schreck, Rohan Sikand, Aditi Somayajula, Jessy Song, Irawadee Thawornbut, Justin Wu, Luke Zhao

Undergraduate Major Advisor

Nikhiya Shamsher

Doctoral (Program)

Samuel Alber, Jake Chang, Peter Eckmann, Karen Feng, Arushi Gupta, Owen Queen, Nitya Thakkar, Haotian Ye, Wanjia Zhao

Publications

PUBLICATIONS

- **BABEL enables cross-modality translation between multiomic profiles at single-cell resolution.** *Proceedings of the National Academy of Sciences of the United States of America*
  Wu, K. E., Yost, K. E., Chang, H. Y., Zou, J.
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- **Evaluating eligibility criteria of oncology trials using real-world data and AI.** *Nature*
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- **How medical AI devices are evaluated: limitations and recommendations from an analysis of FDA approvals.** *Nature medicine*
  Wu, E., Wu, K., Daneshjou, R., Ouyang, D., Ho, D. E., Zou, J.
  2021
- **Integrating spatial gene expression and breast tumour morphology via deep learning.** *Nature biomedical engineering*
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  2020
- **Video-based AI for beat-to-beat assessment of cardiac function.** *Nature*
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- **Fast and covariate-adaptive method amplifies detection power in large-scale multiplehypothesis testing.** *Nature communications*
  Zhang, M. J., Xia, F., Zou, J.
  2019; 10 (1): 3433
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- **Interpretation of Neural Networks Is Fragile**
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- **Making AI Forget You: Data Deletion in Machine Learning**
  Ginart, A. A., Guan, M. Y., Valiant, G., Zou, J.
  edited by Wallach, H., Larochelle, H., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2019
- **Ensuring that biomedical AI benefits diverse populations.** *EBioMedicine*
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- **Data valuation for medical imaging using Shapley value and application to a large-scale chest X-ray dataset.** *Scientific reports*
  Tang, S., Ghorbani, A., Yamashita, R., Rehman, S., Dunnmon, J. A., Zou, J., Rubin, D. L.

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- **How to evaluate deep learning for cancer diagnostics - factors and recommendations.** *Biochimica et biophysica acta. Reviews on cancer*
  Daneshjou, R., He, B., Ouyang, D., Zou, J.
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- **TrueImage: A Machine Learning Algorithm to Improve the Quality of Telehealth Photos.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Vodrahalli, K., Daneshjou, R., Novoa, R. A., Chiou, A., Ko, J. M., Zou, J.
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  Zhang, M. J., Pisco, A. O., Darmanis, S., Zou, J.
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  Vasudevan, V., Gnanasekaran, A., Sankar, V., Vasudevan, S. A., Zou, J.
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  Ouyang, D., Zou, J.
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  Wu, K. E., Parker, K. R., Fazal, F. M., Chang, H., Zou, J.
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- **Video-based AI for beat-to-beat assessment of cardiac function** *NATURE*
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- **Predicting target genes of noncoding regulatory variants with ICE.** *Bioinformatics (Oxford, England)*
  Wu, Z. n., Ioannidis, N. M., Zou, J. n.
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- **Deep learning interpretation of echocardiograms.** *NPJ digital medicine*
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- **Towards Automatic Concept-based Explanations**
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- **Contrastive Multivariate Singular Spectrum Analysis**
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- **Improving the Stability of the Knockoff Procedure: Multiple Simultaneous Knockoffs and Entropy Maximization**
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