# HAOLIN ZOU

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## Research Expertise

**Research Interest:** I have a broad interest in the theoretical foundations of machine learning and AI, primarily using high-dimensional statistical theory both to analyze existing methods and to design new, more reliable algorithms.
**Core areas:** proportional high dimensional asymptotics, risk estimation and cross validation methods, machine unlearning, data evaluation and interpretability.

## Education

- **Columbia University** *Sep 2020 - May 2026*
  *Ph.D in Statistics, GPA: 4.0/4.0* New York, USA
  - Advisor: Arain Maleki, Victor de la Peña.
  - Advanced Coursework: High-Dim Statistics, Decoupling and Self Normalization, Probability (A+), Stats Inference.
- **Columbia University** *Sep 2018 - Dec 2019*
  *Master in Actuarial Science, GPA: 4.0/4.0* New York, USA
- **Peking University** *Sep 2014 - Jul 2018*
  *Bachelor of Applied Mathematics, GPA: 3.6/4.0; Bachelor of Economics (double major), GPA: 3.8/4.0* Beijing, China
  - Strong foundation in mathematical analysis, computational methods, quantitative finance and economics.

## Selected Papers

**[1]** Panley, A., (2025). Gaussian Certified Unlearning in High Dimensions. Submitted to ICLR 2026.

**[2]** Zou, H. et al. (2025). Certified Machine Unlearning Under High Dimensional Regime. Submitted for publication in *JMLR*.

**[3]** Zou, H. et al. (2025). A Complete Error Analysis of the K-fold CV for R-ERM in High Dimensions. Working paper.

**[4]** Zou, H. et al. (2025). Newfluence: Boosting Model Interpretability and Understanding in High Dimensions. ICML 2025.

**[5]** Zou, H. et al. (2024). A Scalable Formula for the Moments of a Family of Self-Normalized Statistics. Submitted to *Stat. Prob. Letters.*

**[6]** Baydil, A., de la Peña, V., Zou, H. and Yao, H. (2025). Unbiased estimation of the Gini coefficient. *Stat. Prob. Letters*, 222: 110376.

**[7]** Zou, H., et al. (2025). Leave-one-out Cross Validation in High Dimensional Settings. *AISTATS 2025*.

**[8]** Auddy, A., Zou, H., Rahnama Rad, K. and Maleki, A. (2024). Approximate Leave-one-out CV for Regression with L1 Regularizers. *IEEE Trans. Inf. Theory*.

**[9]** Auddy, A., Zou, H., Rahnama Rad, K. and Maleki, A. (2024). Approximate Leave-one-out CV for Regression with L1 Regularizers. *Proceedings of The 27th International Conference on AISTATS*,238:2377-2385. **Selected for oral presentation**.

**[10]** de la Peña, V., Gzyl, H., Mayoral, S., Zou, H., and Alemayehu, D. (2024). Prediction and estimation of random variables with infinite mean or variance. *Commun. Stat-Theory and Methods*, 1-15.

## Presentations

- **Minghui Yu Memorial Conference 2025** *Apr 2025*
  *Volunteer presentation on approximate data removal*
- **Columbia Statistics Seminar** *Nov 2024*
  *Volunteer presentation on high dimensional statistics*
- **AISTATS 2024** *May 2024*
  *Paper S.1 Selected for oral presentation in Oral Session 9 ("Statistics")*
- **Minghui Yu Memorial Conference 2024** *Apr 2024*
  *Volunteer presentation on approximate leave-one-out cross validation*
- **INFORMS 2022** *Oct 2022*
  *Session chair ("Heavi-tailedness, Dependence and Robustness"), presentation on the bias of Gini coefficient*

## Teaching Experience

- **Instructor** *Jan 2024 - May 2024*
  *Columbia University*
  - Weekly recitation for Stat Inference and Modeling.
- **Co-instructor** *Apr 2024*
  *Short Course on Decoupling and Self-normalized Inequalities, Georgia Institute of Technology*
  - Co-instructed with Prof. Victor de la Peña on the application of decoupling and self-normalization, including bandit and sorting problems.
- **Teaching Associate** *Sep 2020 - Now*
  *Columbia University*
  - Core MS course: Probability Theory (2 semesters), Statistical Inference (4 semesters)
  - Advanced methods: Generalized Linear Models (1 semester)
  - Undergraduate course: Introduction to Statistics (4 semesters)

## Industry Experience

- **Voleon Capital Management** *May 2025 - Aug 2025*
  *Quantitative Research Intern*
  - Conducted quantitative research in bond pricing and comparison among algorithms.

## Services

- **Peer Reviewing**
  - Annals of Applied Statistics
  - Journal of the Royal Statistical Society
  - IEEE Transactions on Information Theory
  - Conference on Neural Information Processing Systems (NeurIPS)

## Awards and Distinctions

- **Second Prize** *Sep 2017*
  *Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM)*
- **First Class Scholarship** *Sep 2017*
  *Yizheng Alumni Scholarship, top 25%*
- **Honorable Mention** *Feb 2017*
  *Mathematical Contest in Modeling (MCM/ICM)*
- **First Prize** *Oct 2014*
  *China Undergraduate Contest in Physics*

## Additional Information

**Coding and Computing:** Python (proficient), R, MS Office, STATA, STAN (advanced)
**Languages:** English (proficient), Chinese (native), Japanese (proficient), Latin (basic).