GUAN'AO YAN

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RESEARCH AREA

My research interests lies in developing new statistical methods for understanding the real world data. Specific research topics include

- Bioinformatics
  - Statistical methods for analyzing high-dimensional single-cell and spatial omics data
  - Using synthetic data to enhance the statistical rigor in single-cell and spatial omics data analysis
- Statistics: High-dimensional model inference and variable selection
- Education: Statistical methods for enforcing education equity (reported by Forbes news)

EDUCATION

University of California, Los Angeles — 09/2020 - Present

Ph.D. Candidate in Statistics
Advisor: Dr. Jingyi Jessica Li

Zhejiang University — 09/2017 - 03/2020

M.Sc in Probability and Mathematical Statistics
Advisor: Dr. Yi Zhang

Shandong University — 09/2013 - 06/2017

B.Sc in Mathematics and Applied Mathematics
B.Ec in Economics

AWARDS

JXTX+CSHL Genome Informatics 2023 Scholarship	Cold Spring Harbor Laboratory, 2023
Don Ylvisaker Award for the Best Practice of Statistics	University of California, Los Angeles, 2023
Interdisciplinary Opportunity Award	University of California, Irvine, 2022
Most Promising Statistician Award	University of California, Los Angeles, 2022
Summer Mentored Research Fellowship	University of California, Los Angeles, 2021
China National Scholarship	Chinese Government, 2018
Merit Graduate Student Award	Zhejiang University, 2018
Outstanding Student Award	Shandong University, 2014 - 2016
Hua Loo-Keng Talent Scholarship	Chinese Academy of Sciences, 2015

PUBLICATIONS

†*Indicating co-first author*

G. Yan†**, S. Hua**† **and J.J. Li (2024).** Categorization of 31 computational methods to detect spatially variable genes from spatially resolved transcriptomics data. arXiv:2405.18779.

G. Yan, D. Song and J.J. Li (2023). scReadSim: a single-cell RNA-seq and ATAC-seq read simulator. Nature Communications, 14(1), 7428. [Software] [Website]

D. Song, Q. Wang, G. Yan, T. Liu and J.J. Li (2023). scDesign3 generates realistic in silico data for multimodal single-cell and spatial omics. Nature Biotechnology, 1-6. [Software]

Z. Li, Z. M. Patel, D. Song, <u>G. Yan</u>, J. J. Li and L. Pinello (2023). Benchmarking computational methods to identify spatially variable genes and peaks. Biorxiv, 2023-12.

S. Tang, H. Wang, <u>G. Yan</u>, L. Zhang (2022). Empirical likelihood based tests for detecting the presence of significant predictors in marginal quantile regression. Metrika, 1-31.

S. Chen[†], <u>G. Yan</u>[†], W. Zhang, J. Li, R. Jiang and Z. Lin (2021). RA3 is a reference-guided approach for epigenetic characterization of single cells. Nature Communications, 12(1), 1-13. [Software]

J. Zhao, <u>G. Yan</u> and Y. Zhang (2021). Robust estimation and shrinkage in ultrahigh dimensional expectile regression with heavy tails and variance heterogeneity. Statistical Papers, 1-28.

J. Zhao[†], <u>G. Yan</u>[†] and Y. Zhang (2019). Semiparametric expectile regression for high-dimensional heavy-tailed and heterogeneous data. arXiv, 1908.06431.

SOFTWARE

Q-SID An online anti-collusion proctoring system, 2022. [Website] [Forbes news reporting Q-SID]

scReadSim Python package of synthetic reads simulator designed for the single-cell multiomics data, 2022. [Software]

RA3 R package of "RA3 is a reference-guided approach for epigenetic characterization of single cells", 2021. [Software]

PRESENTATIONS & POSTERS

Oral Presentations

· Institute for Computational and Experimental Research in Mathematics (ICERM)   Providence, 12/2023
· Jonsson Comprehensive Cancer Center Gene Regulation Seminar   Los Angeles, 11/2023
· Institute for Quantitative and Computational Biosciences Research Seminar   Los Angeles, 12/2022
· NSF-Simons Center for Multiscale Cell Fate 5th Annual Symposium   Irvine, 10/2022
· The 7th International Conference on Statistics and Probability, IMS-China   Dalian, China, 07/2019

Posters

· Cold Spring Harbor Laboratory Genome Informatics Conference   New York, 12/2023
· RECOMB/ISCB Conference on Regulatory & Systems Genomics   Los Angeles, 11/2023
· CZI Single-Cell Biology 2023 Annual Meeting   Carlsbad, 11/2023
· Intelligent Systems for Molecular Biology/European Conference on Computational Biology   Lyon, France, 07/2023
· LA Bioscience Ecosystem Summit   Los Angeles, 05/2023
· Jonsson Comprehensive Cancer Center Retreat Poster Session   Los Angeles, 05/2023
· Institute for Quantitative and Computational Biosciences Poster Session   Los Angeles, 09/2022

TEACHING & MENTORING

Teaching Assistant

· STATS 205, Hierarchical Linear Models   UCLA, Spring 2024
· STATS 203, Large Sample Theory   UCLA, Winter 2024
· MATH 1001, Advanced Mathematics   Zhejiang University, Fall 2019
· MATH 1001, Advanced Mathematics   Zhejiang University, Fall 2018

Guest lecture

· STATS 205, Hierarchical Linear Models   UCLA, Spring 2024
· BIOINFO 229, Current Topics in Bioinformatics   UCLA, Winter 2024

Student Mentoring

· Weijian Wang (12/2022 -)   Undergraduate Student at Zhejiang University
· Zhiyin Liu (12/2022 -)   Undergraduate Student at Hong Kong University of Science and Technology
· Shuo Hua (06/2022 - 12/2022)   Undergraduate Student at Tsinghua University

EMPLOYMENT

Graduate Student Reseracher   09/2021 – Present
Department of Statistics & Data Science
University of California, Los Angeles
Advisor: Dr. Jingyi Jessica Li

Biostatistician Intern   06/2023 – 09/2023
Data and Statistical Sciences
Product Development Department
Genentech

Research Assistant   06/2019 – 04/2020
Department of Statistics
The Chinese University of Hong Kong
Advisor: Dr. Zhixiang Lin

Research Assistant   06/2016 – 06/2017
Academy of Mathematics and Systems Science
Chinese Academy of Sciences
Advisor: Dr. Jianming Xia

PROFESSIONAL SERVICE

Reviewer for Scientific Journals:
Bioinformatics (3)

Co-reviewer for Scientific Journals:
Cell (2), Nature Biotechnology (1), Nature Methods (3), Nature Communications (3), Nature Machine Intelligence (1), Genome Biology (2), Bioinformatics (2), Journal of the American Statistical Association (1), Annals of Applied Statistics (1), NAR Genomics and Bioinformatics (5), Science Bulletin (1), Statistics in Medicine (1)

Co-reviewer for Scientific Conferences:
Research in Computational Molecular Biology (5), Intelligent Systems for Molecular Biology (5)

PROFESSIONAL AFFILIATIONS

Institute of Mathematical Statistics
American Statistical Association
American Society of Human Genetics
UCLA Jonsson Comprehensive Cancer Centers
International Indian Statistical Association