

Zihan Yang

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Education

Rice University – Houston, Texas

May 2027

GPA: 3.96/4.0 Bachelor of Science in Bioengineering; Minors in Digital Health & Statistics

President's Honor Roll, Rice Undergraduate Scholar (selected as one of 25 students from Rice's Class of 2027)

Relevant Coursework:

ML of Biomedical Time Series Data (A) | Biostatistics (A) | Matrix Analysis (A+) | Linear Regression (A) | Numerical Methods (A) | Probability & Statistics (A) | Multivariable Calculus (A) | Bayesian Statistics (IP)

Publications & Manuscripts

1. **Zihan Yang**, Lulu Shang*. (2026). *MANGO: Mapping Multi-cell-type Multi-scale Spatial Relationships in Spatially Resolved Omics*. Manuscript in preparation. [Poster accepted to STAIIX](#).
Contribution: First author. Developed the statistical test and multiscale permutation framework; designed simulation studies to characterize statistical performance and benchmark against existing methods; validated the approach across multiple 2D and 3D spatial omics datasets.
2. Yuchen Wang, Conor K. Camplisson, Bokai Zhu, **Zihan Yang**, Yuzhou Chang, Shreyansh Padhy, Alex K. Shalek*, Brian J. Beliveau*, Sizun Jiang*. (2026). *ProbeGPT: An Agentic Framework for Spatial Omics Probe Design and Validation*. Abstract submitted to *NeurIPS*. Manuscript in preparation.
Contribution: Co-second author. Built automated workflows to retrieve resources for the RAG knowledge base. Developed the question-generation and benchmarking framework for evaluating ProbeGPT's user Q&A performance against general-purpose language models, and explored structure-preserving approaches for incorporating supplementary tables.
3. Xiaoyun Ding*, Yuki Ogawa, Victoria L. Palfini, Wei Zhang, Andrew P. Anderson, Lucia Gancedo-López, Zian Liao, **Zihan Yang**, ..., Lulu Shang, Pengfei Liu, Jiaying Li, Yudong Gao, Matthew N. Rasband*. (2026). *Paralemm-2 is a shared, alternatively-spliced regulator of axon initial segments and paranodal junctions in oligodendrocytes*. [Submitted to Nature Communications](#).
Contribution: Performed alternative splicing analysis and dimension reduction on a large-scale scRNA-seq dataset.
4. Pengdong Chen, Laura Yee, **Zihan Yang**, Somereet Nijjer, Evan Siemann*. (2026). *Arbuscular mycorrhizal fungi and local soil biota influence invasion intensity of Chinese tallow tree*. In review, *Plant Ecology*.
Contribution: Quantified Arbuscular mycorrhizal fungi colonization frequency through microscopic analysis of plant root samples.

Research Experience

MD Anderson Shang Lab - Biostatistics Research Intern

June 2024 – Present

Advised by Dr. Lulu Shang

- Developing MANGO, a multiscale permutation framework for detecting spatial relationships among multiple cell types; designed simulations and benchmarked its statistical performance against existing methods.
- Validated the framework across 2D and 3D spatial omics datasets from cancer and neural tissues.
- Evaluated clinical relevance of the developed framework by testing associations between spatial cell-type patterns, cancer stage, and patient survival.

Harvard Medical School Jiang Lab - Summer Research Intern*June 2026 – Present**Advised by Dr. Sizun Jiang*

- Developed a question-generation and benchmarking framework to compare ProbeGPT's scientific question-answering performance with general-purpose language models and investigate long-context and retrieval limitations.
- Built automated workflows to retrieve manuscripts, protocols, technical manuals, and webpages, expanding the knowledge base for ProbeGPT's retrieval-augmented generation component. The knowledge base was expanded from 132 to 1,900 documents.
- Validated the INSIDE spatial multi-omics platform by stratifying patient outcomes through learned representations, identifying cell-type annotation discrepancies, and interpreting model outputs across H&E imagery, CODEX protein markers, and clinical metadata.

Baylor College of Medicine - Collaborator*April 2026 – July 2026**Collaboration with Dr. Matthew N. Rasband*

- Performed alternative splicing analysis of Palm2 using the GSE185862 single-cell RNA-seq data and compared splicing patterns across neuronal and non-neuronal cells.
- Built a computational pipeline for RNA-seq preprocessing, STAR alignment, splice-junction mapping, and exon inclusion analysis to quantify cell-type-specific exon splicing patterns.

University of Chicago Basu Lab - Summer Research Intern*June 2025 – Aug 2025**Advised by Dr. Anindita Basu*

- Selected for a competitive NITMB summer fellowship to investigate abnormal hemodynamics in the cephalic arch following arteriovenous fistula creation.
- Developed PyTorch convolutional neural networks to classify blood-flow microscopy images as laminar or non-laminar, achieving high test accuracy on idealized vessel images.
- Compared model performance on idealized and patient-derived images and created visual explanations to explain CNN methods and limitations to experimental and medical collaborators.

Rice University Siemann Lab - Research Intern*Nov 2023 – May 2025**Advised by Dr. Evan Siemann*

- Investigated how geographic variation in local soil microbial communities affects the invasion intensity of Chinese tallow trees grown alone and in competition with native plants.
- Quantified arbuscular mycorrhizal fungi colonization frequency in plant-root samples through microscopy.
- Analyzed relationships between fungal colonization and variation in soil microbial communities.

Posters & Presentations

Poster, Statistics and Trustworthy AI for Cross (X)-Domain Acceleration (STAIX)	2026
Top 10 Poster, Rice University School of Engineering Undergraduate Research Symposium	2026
Oral Presentation, Rice Gulf Coast Undergraduate Research Symposium	2025
Sole Undergraduate Poster, James P. Allison Institute 3rd Annual Scientific Symposium	2025
Poster, National Institute for Theory and Mathematics in Biology (NITMB) Math-Bio Conference	2025

Honors

Rice Undergraduate Scholars Program – Selected as top 25 out of the 2447 students from Rice's Class of 2027 for a year-long honors research program	2026-2027
Louis J. Walsh Merit Scholarship – top 5% of the junior and senior class, Rice University	2026
Summer Owl Edge Research Fund Recipient – awarded the program's maximum funding amount	2026
National Institute for Theory and Mathematics in Biology Research Fellowship	2025
Summer Research Fellowship, Rice University, Department of Biosciences	2024

Teaching and Academic Services

Conference Ad Hoc Reviewer, Statistics and Trustworthy AI for Cross (X)-Domain Acceleration (STAIX)
Undergraduate Student Advisory Committee, Rice University, Department of Bioengineering
Grader, Rice University BIOE 252 Bioengineering Fundamentals
Jones College Academic Fellow

Skills

R, Python, MATLAB, LaTeX, Circuit Design, Graphic Design (Adobe Photoshop, InDesign, Illustrator)

Leadership & Community Engagement

Creative Team Lead - Rice Student Birding Club

Sep 2024 - Present

- Work with the executive board to promote campus bird-watching and conservation events, turning event ideas into clear timelines, graphics, and outreach plans.
- Design club merchandise from initial concepts through production, coordinating budgets and vendors, and organizing campus sales.

Social Media Manager & Designer - Rice Chinese Students and Scholars Association

Sep 2023 – Present

- Create posters and social media content for cultural events attended by more than 600 students and faculty from Rice and other Houston-area colleges.
- Manage the club's social media accounts and use engagement data to improve outreach, helping more students discover events and connect with the community.