

# TIANSHUO ZHOU

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## EDUCATION

Oregon State University (OSU)

Ph.D. candidate in Computer Science

Corvallis, OR 97331, USA

2021–2026 (*expected*)

- Advisor: [Prof. Liang Huang](#)
- Research area: AI-inspired Computational Biology,  
Natural Language Processing, Machine Learning

Nanjing University (NJU)

M.S. in Computer Science

Nanjing, China

2017–2020

Southeast University (SEU)

B.E. in Civil Engineering

Nanjing, China

2017

## PUBLICATIONS & PREPRINTS

[\[Google Scholar\]](#)

\*Top conference in  
Computational Bio.  
by [CSRankings](#)

†Top conference in  
Data Mining by  
[Google Scholar](#)

1. Tianshuo Zhou, Apoorv Malik, Wei Yu Tang, David H. Mathews, Liang Huang. Scalable and Interpretable Identification of Minimal Undesignable RNA Structure Motifs with Rotational Invariance. *In Proceedings of RECOMB\* 2025*. [\[paper\]](#)[\[code\]](#)
  2. Ning Dai, Tianshuo Zhou, Wei Yu Tang, David H. Mathews, Liang Huang. Messenger RNA Design for Ensemble Free Energy via Probabilistic Lattice Parsing. *In Proceedings of ISMB\* 2025*. *Bioinformatics* 41 (Supplement\_1), 2025. [\[paper\]](#)[\[code\]](#)
  3. Tianshuo Zhou, Wei Yu Tang, Apoorv Malik, David H. Mathews, Liang Huang. Theory, Algorithms, and Applications for Undesignability of RNA Structures and Motifs. To appear in *Journal of Computational Biology*, 2025.
  4. Wei Yu Tang, Ning Dai, Tianshuo Zhou, David H. Mathews, Liang Huang. Sampling-based Continuous Optimization with Coupled Variables for RNA Design. Under minor revision, *Nature Communications*. [\[paper\]](#)[\[code\]](#)
  5. Tianshuo Zhou, Wei Yu Tang, David H. Mathews, Liang Huang. Undesignable RNA Structure Identification via Rival Structure Generation and Structure Decomposition. *In Proceedings of RECOMB\* 2024*. [\[paper\]](#)[\[code\]](#)
  6. Tianshuo Zhou, Ning Dai, Sizhen Li, Max Ward, David H Mathews, Liang Huang. RNA Design via Structure-Aware Multi-Frontier Ensemble Optimization. *In Proceedings of ISMB\* 2023*. *Bioinformatics* 39 (Supplement\_1), 2023. [\[paper\]](#)[\[code\]](#)
  7. Tianshuo Zhou, Ziyang Li, Gong Cheng, Jun Wang, Yu'Ang Wei. GREASE: A Generative Model for Relevance Search over Knowledge Graphs. *In Proceedings of WSDM† 2020*. [\[paper\]](#)[\[code\]](#)
  8. Yu Gu, Tianshuo Zhou, Gong Cheng, Ziyang Li, Jeff Z. Pan, Yuzhong Qu. Relevance Search over Schema-Rich Knowledge Graphs. *In Proceedings of WSDM† 2019*. [\[paper\]](#)[\[code\]](#)
- 
9. Tianshuo Zhou, David H. Mathews, Liang Huang. SAMFEO++: Fast RNA design via Motif-level Divide-Conquer-Combine and Structure-level Rival Search. Manuscript in preparation, presented at *Eternacon 2025*. [\[talk link\]](#)
  10. Apoorv Malik, Tianshuo Zhou, Wei Yu Tang, David H. Mathews, Liang Huang. MotifServer: Web Server for Undesignable RNA Motifs and Structures. Pre-submission accepted by *Journal of Molecular Biology*. [\[server\]](#)
  11. Zetian Wu, Tianshuo Zhou, Stefan Lee, Liang Huang. Geometry-Aware Losses for Structure-Preserving Text-to-Sign Language Generation. [\[paper\]](#)
  12. Feipeng Yue, Ning Dai, Wei Yu Tang, Tianshuo Zhou, David H. Mathews and Liang Huang. Sampling-based Continuous Optimization for Messenger RNA Design. Manuscript in preparation.

TEACHING EXPERIENCES	Teaching Assistant & Guest Lecturer ( <a href="#">slides</a> ), CS514 Algorithms, OSU ( <a href="#">link</a> )	Spring 2025
	Guest Lecturer ( <a href="#">slides</a> ), CS261 Data Structures, OSU	Spring 2025
	Teaching Assistant, CS325 Algorithms, OSU ( <a href="#">link</a> )	Spring 2024
	Teaching Assistant, CS514 Algorithms, OSU ( <a href="#">link</a> )	Fall 2023
	Teaching Assistant, CS325 Algorithms, OSU ( <a href="#">link</a> )	Spring 2023
	Teaching Assistant, Graph Theory and Algorithms, NJU ( <a href="#">link</a> )	Spring 2020
	Teaching Assistant, Mathematical Analysis I & II, NJU	Fall 2018 & Spring 2019
ACADEMIC SERVICES	<b>Reviewer:</b> <i>Nature Communications</i> 2024, <i>Bioinformatics</i> 2025, ACM-BCB 2025	
	<b>Co-Reviewer:</b> ISMB 2023, ISMB 2024, ISMB 2025	
	<b>Faculty Hiring Committee for AI &amp; HPC</b> , School of EECS, Oregon State Univ., 2024	
STUDENT MENTORING	1. <b>Wei Yu Tang</b> Graduated from Oregon State University (2024); currently a second-year Ph.D. student at the University of Southern California.	
	2. <b>Feipeng Yue</b> Currently a first-year Ph.D. student at Oregon State University.	
	3. <b>Rigved Naukarkar</b> Currently a master's student at Oregon State University.	
TALKS	1. <i>Eternacon 2025</i> (Invited Talk) ( <a href="#">video</a> )	July, 2025
	Scalable RNA Design via Motif-level Divide-conquer-combine	
	2. <i>RECOMB 2025</i> (Proceedings Talk)	May, 2025
	Scalable and Interpretable Identification of Minimal Undesignable RNA Structure Motifs with Rotational Invariance.	
	3. <i>Eternacon 2024</i> (Invited Talk) ( <a href="#">video</a> )	July, 2024
INDUSTRY EXPERIENCES	Interpretable Identification of Undesignable RNA Secondary Structures	
	4. <i>RECOMB 2024</i> (Proceedings Talk)	May, 2024
	Undesignable RNA Structure Identification via Rival Structure Generation and Structure Decomposition	
	5. <i>ISMB 2023</i> (Proceedings Talk) ( <a href="#">video</a> )	July, 2023
	RNA Design via Structure-Aware Multi-Frontier Ensemble Optimization	
INDUSTRY EXPERIENCES	<b>Uber</b> , <i>Machine Learning Engineer</i>	
	Sunnyvale, CA, 2024.06–2024.09	
	San Francisco, CA, 2023.06–2023.09	
	<ul style="list-style-type: none"> <li>Proposed and developed self-supervised driver representation learning models using LSTM and Transformer architectures.</li> <li>Predicted driver behavior by leveraging Deep Learning models and XGBoost.</li> </ul>	
	<b>ByteDance</b> , <i>Machine Learning Engineer</i>	
	Beijing, China, 2020.07–2020.08	
	<ul style="list-style-type: none"> <li>Implemented ensemble learning models to detect risks in TikTok's automated advertisements.</li> <li>Developed deep learning algorithms for Click-Through Rate (CTR) prediction in TikTok advertisements.</li> </ul>	
	<b>NewsBreak</b> , <i>Natural Language Processing Engineer</i>	
	Beijing, China, 2019.06–2019.09	
	<ul style="list-style-type: none"> <li>Fine-tuned BERT and fastText for news recommendation systems.</li> <li>Extracted keywords from news articles utilizing BM25, Word2Vec, and TextRank.</li> </ul>	

AWARDS AND HONORS	1. New staff training Third Prize, ByteDance	2020
	2. Annually outstanding graduate, Nanjing University	2019
	3. Tung OOCL Scholarship, Nanjing University	2019
	4. Excellence award on structural innovation competition of Southeast University	2015
	5. National Inspirational Scholarship, Southeast University	2015
REFERENCES	1. Liang Huang (PhD advisor). Professor of Computer Science and (by courtesy) Biochemistry/Biophysics, Oregon State University Email: <a href="mailto:liang.huang@oregonstate.edu">liang.huang@oregonstate.edu</a> Homepage: <a href="https://web.engr.oregonstate.edu/~huanlian">https://web.engr.oregonstate.edu/~huanlian</a>	
	2. David H. Mathews ( <i>de facto</i> co-advisor and long-term collaborator). Lynne E. Maquat Distinguished Professor of RNA Biology; Professor of Biochemistry & Biophysics and Biostatistics & Computational Biology, University of Rochester Medical Center Email: <a href="mailto:david_mathews@urmc.rochester.edu">david_mathews@urmc.rochester.edu</a> Homepage: <a href="http://rna.urmc.rochester.edu">http://rna.urmc.rochester.edu</a>	
	3. David Hendrix (PhD committee member). Professor of the Department of Biochemistry and Biophysics, and of the School of EECS, Oregon State University Email: <a href="mailto:david.hendrix@oregonstate.edu">david.hendrix@oregonstate.edu</a> Homepage: <a href="https://engineering.oregonstate.edu/people/david-hendrix">https://engineering.oregonstate.edu/people/david-hendrix</a>	
	4. Max Ward (collaborator). Lecturer, School of Physics, Maths and Computing, Computer Science and Software Engineering, The University of Western Australia Email: <a href="mailto:max.ward@uwa.edu.au">max.ward@uwa.edu.au</a> Homepage: <a href="https://research-repository.uwa.edu.au/en/persons/max-ward">https://research-repository.uwa.edu.au/en/persons/max-ward</a>	