

Ziqi (Amber) Tang

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📍 One Bungtown Road, Cold Spring Harbor, NY

Education

Cold Spring Harbor Laboratory

Ph.D. Candidate in Biology

Fall 2019 - Current

Expected graduation May 2024

University of North Carolina at Chapel Hill

BS. in Biology; BS. in Computer Science

Fall 2015 - Spring 2019

Graduated with Distinction and Highest Honors

Research Experience

Peter Koo Lab at Cold Spring Harbor Laboratory

Ph.D. candidate

April 2020 - Current

- Assessed transfer learning with transformer-based language models for various RNA regulation prediction tasks
- Prototyped a multi-task convolutional network that predicts various RNA regulatory functions from primary sequence
- Developed a framework to comprehensively evaluate the generalization and interpretability of convolutional networks for predicting epigenomics data
- Deployed a deep convolutional network to model single-cell ATAC-seq data and performed model interpretability methods to uncover learned cell-type specific features

Camford Capital

Venture Fellow

July 2023 - Oct 2023

- Prototyped algorithms for Deep Learning guided sequence design
- Participated in internal venture initiatives at the interface of Computation, Artificial Intelligence and Biomedicine

Terry Furey Lab at Department of Genetics, UNC Chapel-Hill

Research Assistant

Fall 2017 - Spring 2019

- Analyzed ATAC-seq data from patients with Crohn's disease
- Investigated the role of allelic imbalance expression in inflammatory tissue

Dayan Network Neuroscience Lab at Department of Radiology, UNC Chapel-Hill

Research Assistant

Fall 2017 - Spring 2019

- Differentiated prodromal Parkinson's disease patients from healthy individuals fMRI images using SVM
- Generated brain connectivity matrix for Parkinson's Disease patients

Publications and Conferences

Publications

- Toneyan, S.*, **Tang, Z.***, Koo, P., *Evaluating deep learning for predicting epigenomic profiles*, Nature Machine Intelligence, Dec 2022. [\[Link\]](#)
- Kawaguchi, R., **Tang, Z.**, Fischer, S., Rajesh, C., Tripathy, R., Koo, P., Gillis, J., *Learning single-cell chromatin accessibility profiles using meta-analytic marker genes*, Briefings in Bioinformatics, Dec 2022. [\[Link\]](#)
- Majdandzic, A., Rajesh, C., **Tang, Z.**, Toneyan, S., Labelson, E., Tripathy, R., Koo, P., *Selecting deep neural networks that yield consistent attribution-based interpretations for genomics*, Proceedings of the 17th Machine Learning in Computational Biology meeting, Dec 2022. [\[Link\]](#)
- Lee, N., **Tang, Z.**, Toneyan, S., Koo, P., *EvoAug: improving generalization and interpretability of genomic deep neural networks with evolution-inspired data augmentations*, Genome Biology, May 2023. [\[link\]](#)
- **Tang, Z.**, Toneyan, S., Koo, P., *Current approaches to genomic deep learning struggle to fully capture human genetic variation*, Nature Genetics, News & Views, Dec 2023. [\[link\]](#)

- **Tang, Z.**, Koo, P., *Evaluating the representational power of pre-trained DNA language models for regulatory genomics*, BioRxiv, Mar 2024. [\[link\]](#)

Conferences and Presentations

Poster presenter

- *Building foundation models for regulatory genomics requires rethinking large language models*; International Conference on Machine Learning Computational Biology Workshop 2023
- *Benchmarking Binary and Quantitative Genomic Models*; Biology of Genomes 2022
- *Evaluating deep learning for predicting epigenomic profiles*; Intelligent Systems for Molecular Biology 2022
- *Evaluating deep learning for predicting epigenomic profiles*; American Society of Human Genomics 2022

Professional Service

Diversity Initiative for the Advancement of STEM at CSHL

E-board member

Spring 2022 - Current

- Organized seminars and discussions to support and increase the presence of underrepresented minorities in STEM fields

Reviewer

- Nature Genetics, Nature Methods, Bioinformatics, Machine Learning in Structural Biology workshop, NeurIPS 2022, International Conference on Research in Computational Molecular Biology 2024

Program Committee

- Machine Learning in Computational Biology 2022

Additional Experience

CSHL Post-baccalaureate Research Education Program

Mentor

Summer 2023 - Current

- Mentored a PREP scholar, guiding their research project and supporting the preparation of graduate school applications.

CSHL Undergraduate Research Program

Mentor

Summer 2021-2023

- Lead lectures in Programming Course, introducing methods in biological data analysis for 20+ undergraduate students

CIFAR Deep Learning + Reinforcement learning Summer School

Participant

July 2021

- Participated in lecture and discussions about cutting-edge topics in machine learning

Computer Science department, UNC Chapel-Hill

Teaching Assistant

Fall 2017 - Fall 2018

- Assisted teaching in Data Structure and Introduction to Algorithm for 100+ students

Technical Skills

- Coding in Python, C, java, SQL
- Frameworks including TensorFlow, PyTorch and Git
- Experience with developing machine learning models, evaluating their performance, and model interpretation for scientific discovery on high performance computing clusters (UGE, Slurm)

References

- Dr. Peter Koo
Assistant Professor, Cold Spring Harbor Laboratory, Ph.D. Advisor
✉ koo@cshl.edu
- Dr. Justin Kinney
Associate Professor, Cold Spring Harbor Laboratory, Thesis Committee Member
✉ jkinney@cshl.edu
- Dr. Jesse Gillis
Associate Professor, University of Toronto, Thesis Committee Chair
✉ jesse.gillis@utoronto.ca