

Education

School of Life Science, Tsinghua University

Beijing, China

B.S. IN LIFE SCIENCE GPA: 3.6

Sept. 2014 - June. 2019

- **Minor in Statistics**
- **XueTang program** 2015-2019
- **XinYa College**
- **Related Courses:** • Calculus • Linear Algebra • Probability and Statistics • Mathematical Modelling • System and Computational Neuroscience • Biostatistics • Bioinformatics • Pattern Recognition • Artificial Neural Networks • Neuroscience and AI • Machine Learning and Brain Inspired Intelligence

Publications

- | | | |
|------|---|-----------------|
| 2018 | 3D synapse detection and polarity identification , Conference on Computer Vision and Pattern Recognition | Submitted |
| 2018 | exSeek: Robust exRNA Analysis Tool for Noninvasive Biomarker , Nucleic Acids Research | Ready to Submit |
| 2018 | DeepShape: Detection of Sequence and Structural Motif using Deep Learning , Biology Forum in Tsinghua | Poster |

Research Experience

DeepShape: Detection of Sequence and Structural Motif using Deep Learning

Lu Lab, Tsinghua University

[\[Poster Link\]](#)

SUPERVISOR: **ZHI LU**

2017-2018

- Process structure probing data for 1D and 2D deep learning model in structure prediction
- Use unsupervised deep learning model (VAE) and attention model for Motif detection and localization.
- Use graph convolution neural networks to learn meaningful structural motif.

exSeek: Robust exRNA Analysis Tool for Noninvasive Biomarker

Lu Lab, Tsinghua University

SUPERVISOR: **ZHI LU**

2017-2018

- Develop a complete pipeline for exRNA analysis. Includes mapping, counts, matrix processing, robust feature selection and evaluation
- Use statistical and machine learning model for imputation, normalization, batch removal and feature selection.
- Package all functions into software. Validate on published and own dataset.

eMaize: Develop a machine learning method to predict quantitative traits of

Lu Lab, Tsinghua University

maize [\[Paper Link\]](#)

SUPERVISOR: **ZHI LU**

2017-2018

- Develop a new linear mixed model to predict traits of 36,000 hybrids samples using SNP data to find heterosis.
- Develop a non-parameter model to solve small sample training problems.

Reconstruction of neural muscular junction connectomic EM data [\[Report Link\]](#)

Lichtman Lab, Harvard University

SUPERVISOR: **JEFF LIGHTMAN**

2018 Summer

- Use 3D U-net for membrane prediction and tracing.
- 3D reconstruction of 13 NMJs (largest ever).
- Quantify the linear correlation of axonal diameter and synaptic area by statistical analysis.

Synapse prediction and synaptic partner identification [\[Report Link\]](#)

Visual Computing Group, Harvard University

SUPERVISOR: **HANSPETER PFISTER**

2018 Summer

- Construct a powerful 3D U-net for synapse detection in CREMI dataset. Rank top 1 in CREMI contest.
- Construct 3D U-net and 3D-CNN for synaptic polarity identification. Use VAE to cluster synapses for proofreading
- Apply models to predict on JWR dataset with 1 million synapses. Submit a paper to Conference on Computer Vision and Pattern Recognition

Mixture density network for Localization Using NLOS TOAs or TDOAs

NYU wireless, New York University

COLLABORATOR: **JUN LI**

2017-2018

- Mixture density network for jointly predicting x, y and z coordinates.
- Mixture density network for uncertainty estimation to identify confusing points.

Cardiacai: a deep learning model for cardiac disease detection [\[Report Link\]](#)

Tsinghua University

SUPERVISOR: **HONGLIANG YU**

2017

- Use Deep learning models to analyze 3,000 X-ray chest image for heart disease classification.
- Utilize a U-net for heart region attention and a VGG-net for classification.
- Win the second prize in the contest.

Medical data Analysis: Student research training project [\[Report Link\]](#)

Tsinghua University

SUPERVISOR: **XUEGONG ZHANG**

2016-2017

- Use Deep learning models to analyze medical images.
- Collect X-ray and CT images to detect lung diseases. Use 3D and 2D U-net for nodes detection.

Activities&Awards

2018	Teaching Assistant in Bioinformatics Basic Course , Contribute to teaching book	<i>University</i>
2015-2018	Scholarship , XueTang scholarship	<i>University</i>
2017	Second prize , The First National College Students' Brain Computation and Application Competition	<i>International</i>
2017	First Prize , eMaize Challenge: Machine learning in breeding	<i>National</i>
2018	Meritorious Winner , Mathematical Contest in Modeling (MCM) [Paper Link]	<i>International</i>
2016-2018	Xuetang Research Funding , \$10,000 for Research in Lu lab	<i>University</i>
2016-2018	Research Promotion Program Funding , \$8,000 for Research in Biomedical Image analysis	<i>University</i>
2015	Golden Prize , Social practice award for investigation on e-cycling	<i>University</i>
2015	Grand Prize & best captain , Return to Alma mater activity : Built a platform with overall 440,000 reads, Published a book with 5,000 copies.	<i>University</i>