

Xupeng Chen

LIFE SCIENCE · TSINGHUA UNIVERSITY

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Education

School of Life Science, Tsinghua University

Beijing, China

B.S. IN LIFE SCIENCE

Sept. 2014 - June. 2019

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

Honors & Awards

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|-----------|--|---------------|
| 2015-2018 | Scholarship , XueTang scholarship | University |
| 2017 | Second prize , The First National College Students' Brain Computation and Application Competition | International |
| 2017 | First Prize , eMaize Challenge: Machine learning in breeding | National |
| 2018 | Meritorious Winner , Mathematical Contest in Modeling (MCM) [Paper Link] | International |
| 2015 | Golden Prize , Social practice award | University |
| 2015 | Grand Prize & best captain , Return to Alma mater activity | University |
| 2016-2018 | Xuetang Research Funding , \$10,000 for Research in Lu lab | University |
| 2016-2018 | Research Promotion Program Funding , \$8,000 for Research in Applied Deep learning in Biomedical Image analysis | University |

Skills

Computer Science

- Programming skills: Python, C++, Julia, MATLAB, R.
- Familiar with Machine Learning, Deep Learning (Tensorflow, Keras, Pytorch) and Computer Vision.
- Familiar with Linux, MacOS, Windows

Language

- CET-6, TOEFL (110)

Research Experience

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eMaize: Develop a machine learning method to predict quantitative traits of maize [\[Paper Link\]](#)

Lu Lab, Tsinghua University

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.

Deepshape: Develop a deep learning method to predict the structure of RNA and find MOTIF

Lu Lab, Tsinghua University

SUPERVISOR: ZHI LU

2017-2018

- Process icSHAPE data to train machine learning and deep learning model.
- Transform structure data to image form and develop a modified U-net model to predict.
- Use unsupervised model (VAE) and attention model to classify motif and find its position.
- Use adaptive graph convolution neural networks to learn meaningful structural motif.

exRNA: Detection of early-stage liver cancer using extracellular RNA as biomarker

Lu Lab, Tsinghua University

SUPERVISOR: ZHI LU

2017-2018

- Develop a fast method for testing different mapping order of various kinds of RNAs.
- Use statistical methods for sample QC, feature imputation, normalization and batch effect removal.
- Develop robust feature selection and machine learning methods to classify stages of liver cancer and identify novel RNA biomarker.

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

Lichtman Lab, Harvard University

SUPERVISOR: JEFF LICHTMAN

2018 Summer

- Use 3D U-net for membrane prediction and z-watershed for axon segmentation.
- Automatic segmenting and tracing.
- 3D reconstruction of axons and NMJs and statistical analysis.

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

Visual Computing Group, Harvard University

SUPERVISOR: HANSPETER PFISTER

2018 Summer

- 3D U-net for synapse detection in CREMI and JWR data.
- 3D U-net and 3D-CNN for pre and post synaptic partner identification.
- Synapse structure and type analysis.

Mixture density network for Localization Using NLOS TOAs or TDOAs

NYU wireless, New York University

SUPERVISOR: I-TAI LU

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 [\[Paper Link\]](#)

Tsinghua University

SUPERVISOR: HONGLIANG YU

2017

- Use Deep learning models to analyze X-ray chest image.
- Design new models to classify disease & design a website.
- Win the second prize in the contest.

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

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 deep learning model.