

# 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 | <b>Scholarship</b> , XueTang scholarship   | University    |
| 2017      | <b>Second prize</b> , The First National College Students' Brain Computation and Application Competition               | International |
| 2017      | <b>First Prize</b> , eMaize Challenge: Machine learning in breeding  | National      |
| 2018      | <b>Meritorious Winner</b> , Mathematical Contest in Modeling (MCM) <a href="#">[Paper Link]</a>                        | International |
| 2015      | <b>Golden Prize</b> , Social practice award  | University    |
| 2015      | <b>Grand Prize &amp; best captain</b> , Return to Alma mater activity  | University    |
| 2016-2018 | <b>Xuetang Research Funding</b> , \$10,000 for Research in Lu lab  | University    |
| 2016-2018 | <b>Research Promotion Program Funding</b> , \$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 and normalization
- 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

- Generate 3D masks for alignment
- 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