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 • Fundamental Neuroscience

Honors & Awards

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

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 second prize in the contest

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

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
- Use 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

Lichtman Lab, Harvard University

Supervisor: **Jeff Lichtman** *2018*

- Generate 3D masks for alignment
- Use 3D U-net for membrane prediction and z-watershed for axon segmentation
- 3D reconstruction of axons and statistical analysis

Synapse prediction and synaptic partner identification

Visual Computing Group, Harvard University

Supervisor: **Hanspeter Pfister** *2018*

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

Mixture density network for Localization Using NLOS TOAs or TDOAs

NYU wireless, New York University

Supervisor: **I-Tai Lu** *2018*

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

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
- Use customized equipment to record individuals long time EGG data and anaylze.